ΕΛΛΗΝΙΚΗ ΔΗΜΟΚΡΑΤΙΑ
Εθνικόν και Καποδιστριακόν Πανεπιστήμιον Αθηνών
—— ΙΔΡΥΘΕΝ ΤΟ 1837 ——

ΠΜΣ **ΚΥΒΕΡΝΟΨΥΧΟΛΟΓΙΑ**

Psychometric Validation of the Greek Internet Gaming Disorder Scale-Short Form

Μόσχοβου Ευγενία (Α.Μ.: 7567132200006)

Π.Μ.Σ. «Κυβερνοψυχολογία»

Τμήμα Ψυχολογίας, Εθνικό και Καποδιστριακό Πανεπιστήμιο Αθηνών

Διπλωματική Εργασία

Επόπτες: Νικολάου Κάκια- Ψυχίατρος, Ρούσσος Πέτρος- Αναπληρωτής Καθηγητής Γνωστικής Ψυχολογίας

Απρίλιος 2024

Τριμελής Επιτροπή:

Νικολάου Κάκια- Ψυχίατρος

Ρούσσος Πέτρος- Αναπληρωτής Καθηγητής Γνωστικής Ψυχολογίας

Τσαούσης Ιωάννης, Επίκουρος Καθηγητής Ψυχομετρίας

Σημείωμα συγγραφέα

Η συγγραφέας βεβαιώνει ότι το περιεχόμενο του παρόντος έργου είναι

αποτέλεσμα προσωπικής εργασίας και ότι έχει γίνει η κατάλληλη αναφορά στην

εργασία τρίτων, όπου κάτι τέτοιο ήταν απαραίτητο, σύμφωνα με τους κανόνες της

ακαδημαϊκής δεοντολογίας.

Abstract

Since the inclusion of the Internet Gaming Disorder (IGD) in the DSM-5, the Internet Gaming Disorder Scale-Short Form (IGDS9-SF), a nine-item test, has become one of the most used instruments for the diagnostic assessment of the disorder. Translation and validation of such a scale are important for cross-cultural use. The aim of this study was to examine the psychometric properties (factor structure, reliability and validity) of the Greek version of the Internet Gaming Disorder Scale-Short Form in the Greek population. The present sample included 252 participants. Participants completed a self-administered online survey including questions on sociodemographic data and gaming habits, the adapted version of the IGDS9-SF, the Gaming Disorder Test (GDT) and the Problematic Internet Use Questionnaire (PIUQ-9). Confirmatory factor analysis yielded a one-dimensional model with a good fit. Reliability analysis was performed using Cronbach's alpha (α) and omega (ω) as the indicators of internal consistency. A positive and strong relationship was found between IGDS9-SF and GDT, while the relationship between IGDS9-SF and PIUQ-9 was found to be positive but modest. This study provides validity and reliability evidence for the use of the Greek version of the IGDS9-SF in the assessment of Internet Gaming Disorder, further supporting its usefulness as a robust psychometric tool that can be employed in clinical and research settings in Greece.

Key words: Internet Gaming Disorder, Gaming Addiction, Internet Gaming Disorder Scale-Short Form

Content

Introduction

Online video games have become a major leisure, as well as educational and professional activity for children and adults over the past years (Wu et al., 2023). Internet gaming has become part of our daily lives and has had a positive impact in areas such as entertainment and education. Moderate online gaming may have a positive effect on improving visuospatial ability and motor skills, maintaining pleasure levels and bringing at the same time new prospects in the field of education. (Gao et al. 2022). Digital games' popularity and exponential use has raised, nevertheless, concerns in the scientific community (Billieux et al., 2015), as excessive gaming may constitute a behavioral problem due to the potential of developing internet gaming disorder (Wu et al., 2023).

Researchers in the 90s used, and carried on using over the years, different terms and criteria to describe the same phenomenon, as well as various assessment tools to measure it. Nearly all were criticized for not being specific (Laconi et al, 2019, 2014; Pontes & Griffiths, 2015). Problematic or pathological internet use (PIU), or internet addiction is usually seen as a broad term including several problematic online behaviors such as gambling, gaming, social media, pornography (Laconi et al., 2019). In the last 15 years, research has focused on specific problematic internet use moving from general problematic internet use to online gaming (Beranuy et al., 2020; Király et al, 2014; Sussman et al, 2018).

Evidence demonstrates that online game overuse is most of the times the main presenting problem in treatment-seeking self-identified internet users (Billieux et al.,

2015). The impact of video and digital game playing on the potential development of addictive behavior has been under scrutiny for many years (De Palo et al., 2019; Przybylski et al, 2010; Rosenkranz et al, 2017). Before the publication of the fifth edition of the Diagnostic Statistical Manual of Psychiatric Disorders by the American Psychiatric Association in 2013 (American Psychiatric Association, 2013), researchers and clinicians lacked clarity regarding the fundamental diagnostic criteria for this addiction behavior to digital games (Pontes et al., 2019).

The American Psychiatric Association (APA) attempted to clear confusion and create consensus by introducing Internet Gaming Disorder (IGD) as a "tentative definition of a tentative disorder that needs further research before it can be accepted as a valid diagnostic category", classified in the research appendix in the 'Other Conditions that may be a Focus of Clinical Attention/ Conditions for Further Study' chapter in Section III as a potential new diagnosis (American Psychiatric Association, 2013). The clinical diagnosis of IGD describes "a behavior involving constant and repetitive use of the internet for online gaming, leading to significant impairment or distress over a period of 12 months by adopting five (or more) of the nine criteria" (American Psychiatric Association, 2013). The proposed diagnostic criteria for IGD in the DSM-5 include the following: (1) preoccupation with games, (2) withdrawal symptoms when gaming is taken away, (3) tolerance, resulting in the need to spend increasing amounts of time engaged in games, (4) unsuccessful attempts to control participation in games, (5) loss of interest in previous hobbies and entertainment, resulting from and excluding games, (6) continued excessive use of games despite

knowledge of psychosocial problems, (7) deceiving family members, therapists or others concerning the gaming, (8) use of games to escape or relieve negative moods, and (9) jeopardizing or losing a significant relationship, job, education or career opportunity because of participation in games (American Psychiatric Association, 2013). With the severity of IGD being increased, consequences such as 'academic failure, job loss, marriage failure may occur, as the problematic behavior tends to displace usual and expected social, work and/or educational, relationship and family activities' (American Psychiatric Association, 2013).

The World Health Organization (WHO) recognized Gaming Disorder (Code 6C51) as a mental health disorder in the 11th revision of the International Classification of Diseases and Related Health Problems (ICD-11), classified under "disorders due to addictive behaviors" and was put in effect as of 1.1.2022 (WHO, 2022). The criteria describe "a pattern of persistent or recurrent gaming behaviour ('digital gaming' or 'video-gaming'), which may be online (i.e., over the internet) or offline, manifested by: 1. impaired control over gaming (e.g., onset, frequency, intensity, duration, termination, context); 2. increasing priority given to gaming to the extent that gaming takes precedence over other life interests and daily activities; and 3. continuation or escalation of gaming despite the occurrence of negative consequences. The pattern of gaming behaviour may be continuous or episodic and recurrent. The pattern of gaming behaviour results in marked distress or significant impairment in personal, family, social, educational, occupational, or other important areas of functioning. The gaming behaviour and other features are normally evident over a

period of at least 12 months in order for a diagnosis to be assigned, although the

required duration may be shortened if all diagnostic requirements are met and

symptoms are severe" (WHO, 2022).

Despite the international appeal for consensus, the two classification systems

attempt to define the same clinical phenomenon using different names and different

diagnostic criteria of their respective constructs. IGD is still a tentative diagnosis,

including only online gaming, leaning heavily on substance use and gambling criteria

and suggesting that more gaming hours predict disordered gaming, whereas GD is an

official addictive disorder, including both off- and online gaming, not specifying time

limits and introducing hazardous gaming as a different category. They both propose

though the same timeframe of 12 months (Montag et al, 2019; Pontes et al, 2022).

There seems to exist a good consistency between ICD-11-GD and DSM-5-IGD

criteria. Even though the ICD-11 criteria have a higher threshold for diagnosing GD

than DSM-5 criteria for diagnosing IGD, the Hazardous Gaming diagnosis could

compensate for this (Yen et al, 2022). An IGD diagnosis seems to be more stable and

lasting in time, whereas a GD diagnosis might be more inclined to change and was

also found to be more affected by comorbid psychiatric disorders (Hong et al, 2023).

There is evidence for minor discrepancies in the estimation of prevalence between the

two systems applied. The WHO-ICD 11 GD criteria show lower results than the APA

DSM-5 IGD criteria (Pontes et al, 2022).

Out of DSM-5's nine criteria, seven align with those of gambling disorder, and

five with the ones of substance abuse disorder. These nine criteria directly correspond

to the six criteria of Griffiths' components model of addiction, which has been employed to conceptualize several technological addictions (Griffiths, 2005; Monacis et al., 2016). The six criteria encompass 'salience, mood modification, tolerance, withdrawal symptoms, conflict and relapse'. Salience manifests when addictive activities dominate a person's thoughts, emotions and actions. Mood modification arises when an individual engages in activities to alter their emotional state. Tolerance involves the need to escalate the level of involvement in the addictive behavior to achieve the initial mood-altering effects. Withdrawal symptoms entail the unpleasant emotional states that emerge when the individual decreases or abruptly reduces their addictive activities. Conflict denotes both the internal and interpersonal issues that arise as a result of addictive activities. Relapse signifies the unsuccessful attempts to discontinue engaging in the addictive behavior when the individual is striving to quit (Griffiths, 2005; Monacis et al., 2016). Based on the above gaming may be considered as an important public health issue.

Internet Gaming Disorder is defined as an addictive behavior that does not involve the ingestion of a psychoactive substance (Beranuy et al., 2020) and has been widely described as a form of persistent and recurrent preoccupation with video and online games, often resulting to the decline of daily work and personal activities (Stavropoulos et al., 2018). Besides time and effort spent on playing video and online games, a disordered gamer's physical and psychological well-being can be affected seriously (Salvarli & Griffiths, 2021). Internet Gaming Disorder may lead to a variety of health problems including visual impairment, sleep deprivation, day-night reversal,

photosensitive seizures (in people with a pre-existing condition) and irritability. Furthermore, it has been linked with other psychiatric issues such as depression, anxiety, substance use, gambling and other behavioral addictions (Wu et al., 2023).

Online gaming has long been considered as a factor associated with other problematic internet behaviors (Kuss et al., 2014). Examining how problematic internet use behaviors like gambling, pornography and social media relate to IGD is crucial because these behaviors also stem from technology and typically share similar addiction criteria (salience, mood modification, tolerance, withdrawal, conflict and relapse) with IGD when people present with clinical problems (Beranuy et al., 2020).

Despite IGD's official recognition as a mental disorder by the World Health Organisation, there are concerns regarding formal acknowledgement due to a perceived lack of sufficient scientific support and clinical usefulness to warrant its medical recognition. Many scientists are still skeptical regarding possible moral panics, a premature application of a clinical diagnosis and the treatment of false-positive cases, especially among children and adolescents. Research may be locked into a confirmatory approach rather than an exploration of the boundaries of normal versus pathological and the healthy majority of gamers may be affected by stigma and perhaps even changes in policy (Aarseth et al, 2017).

These kinds of arguments represent the challenges in accurately identifying pathological and non pathological behavior in the psychometric and clinical assessment of the phenomenon (Pontes at al., 2019). On the contrary it has been suggested that gaming may range on a continuum from non-problematic occasional

and regular gaming to gaming that is problematic, excessive and addictive, and stands as a disorder (Griffiths et al., 2017). Although a rare phenomenon, according to more reliable prevalence rates, neglecting the clinical significance of excessive gaming and the potential negative effects it may have on overall health might have serious implications (Pontes at al., 2019).

It is true that the quality of the research base is low, with various methodological problems (sample selection, self-report, very few longitudinal studies, different definitions, diagnostic criteria and assessment tools applied) have produced a wide range of prevalence rates across countries with a cross-cultural variability, a west to east gradient (Hong et al, 2023).

The worldwide prevalence of Internet Gaming Disorder (IGD) appears to be around 3,3% based on recent meta-analyses' (Kim et al., 2022; Stevens et al, 2021). The traditional stereotype of a gamer as a teenage boy is considered to be outdated, as statistics show nowadays that 31% of gamers are adult women and the average age of gamers is 35 years old (Salvarli & Griffiths, 2021), which may eventually have an impact on the demographics of disordered gaming as well.

The necessity to consolidate the issue of diagnosis, since an early evaluation of IGD is, important to optimize prevention and treatment efforts, has resulted in an increase on research focused on assessing IGD with psychometric tools developed under the framework established by the American Psychiatric Association (Pontes at al., 2019). Given the prevailing methodological challenges in evaluating internet gaming disorder, the demand for a reliable, standardized measurement of IGD

emerged as a prominent concern in pertinent research (Stavropoulos et al., 2018). To meet this requirement, the Internet Gaming Disorder Scale-Short Form (IGDS9-SF) was created as a concise screening instrument incorporating the nine criteria outlined by the DSM-5 (Pontes & Griffiths, 2015). IGDS9-SF aids in achieving the goal of unifying assessments for Internet Gaming Disorder (Severo et al., 2020). Research indicates the nine-item Internet Gaming Disorder Scale-Short Form (IGDS9-SF) as the instrument assessing IGD that has been most reviewed and translated (Beranuy et al., 2020), as since its publication it has been extensively investigated in a number of cultural contexts and has been translated in seventeen languages (Poon et al., 2021).

These languages include: three sublanguages of Chinese (Poon et al., 2021), traditional Chinese in Hong Kong (Poon et al., 2021; Yam et al., 2019), traditional Chinese in Taiwan (Poon et al., 2021; Leung et al., 2020; Chen et al., 2020), simplified Chinese in China (Chen et al., 2020; Poon et al., 2021), German (Jeromin et al., 2016), Czech (Suchá, 2018), Slovenian (Pontes et al., 2016), Italian (Monacis et al., 2016), Persian (Wu et al., 2017), Spanish (Beranuy et al., 2020), Turkish (Evren et al., 2018), Polish (Schivinski et al., 2018), Portuguese (Pontes & Griffiths, 2016), Brazilian (Severo et al., 2020), Albanian, English (De Palo et al., 2019), Malaysian (Ling et al., 2021) and Korean (Kim & Ko, 2020).

Further cross-cultural psychometric studies revealed that the IGDS9-SF exhibited sufficient measurement invariance among various countries and gamer populations such as between Australian, North American (USA), and British gamers (Stavropoulos et al., 2018). Similar results were also found between USA, India and

United Kingdom (UK) (Pontes et al., 2017). Subsequent research indicated that the

IGDS9-SF maintained measurement invariance among gamers from Albania, USA,

UK and Italy (De Palo et al., 2019). Collectively, the growing body of empirical

research on the cross-cultural validity and applicability of the IGDS9-SF indicates this

psychometric instrument is both valid and reliable for evaluating addictive gaming

behaviors within the DSM-5 framework (Severo et al., 2020).

    With research on gaming disorder expanding worldwide and across various

disciplines such as clinical psychology and human-computer interaction, and given its

widespread implementation and usage, it has become crucial to assess the

cross-cultural characteristics of an instrument like IGDS9-SF (Stavropoulos et al.,

2018). In order for this instrument to be effective across cultures, cross-cultural data

on reliability and validity of the diagnostic criteria is important, as well as the

prevalence rates in countries all over the world (Pontes at al., 2019).

    The present study aims to validate and examine the psychometric properties of a

Greek version of IGDS9-SF as it has not been explored in Greece yet. More

specifically, the study aims to investigate the factorial structure, reliability and

validity of IGDS9-SF in a broad sample of Greek-speaking gamers. To explore the

concurrent validity, we correlated it with Gaming Disorder Test (GDT) and

Problematic Internet Use Questionnaire (PIUQ-9).

Method

Participants

The present study was conducted between January and February 2024. During this period, 252 participants in Greece were recruited through convenience sampling via an online survey developed in Google Form. The mean age of the sample was 33.4 years (SD=9.88) and the age range varied from 18-70 years old. Out of the 252 participants, 98 were males (38.9%) and 154 were females (61.1%).

Measures

Sociodemographic information

Participants provided sociodemographic data regarding their age and gender. It has been established in literature that male individuals are more likely to present with internet gaming disorder than females (Pontes et al., 2022).

Hours of gaming per day- Years of gaming

Research evidence indicates that disordered gamers typically spend at least 30 hours per week playing games (Pontes & Griffiths, 2015). The amount of time spent on gaming is a strong indicator of disordered gaming, as longer time dedicated to gaming consistently leads to higher levels of disordered gaming symptoms. In DSM-5 it is suggested that those experiencing disordered gaming will be spending typically 8-10 hours per day or at least 30 h/week to gaming (APA, 2013). The positive association between screen time and the development of IGD is being supported by research evidence (Buren et al, 2023). In a recent study disordered gaming was

associated on average with 34.53 h of gaming a week when at least five DSM 5

criteria were endorsed and higher gaming-time-averages when endorsing more criteria

(APA, 2013) and was associated on average with 40.13 h/week when all ICD-11

criteria were endorsed (WHO, 2022) (Pontes et al, 2022).

Over the years, excessive gaming can become a coping mechanism, a way out, an

escape from emotional distress, offering relief, a self-medication attempt that

interferes with other aspects of life and individuals may develop a dependence on the

rewards received by gaming leading to compulsive gaming behavior (Mentzoni et al.,

2011). But this is not simply a linear relationship, there is still little evidence and

understanding on the role of screening time, we don't know how much is enough and

which are the healthy limits (Pontes et al, 2022).

"Hours of gaming" in our study examined the hours spent playing games online

and offline per day and "years of gaming" the overall number of years playing games.

Internet Gaming Disorder Scale- Short-Form (IGDS9-SF)

IGDS9-SF was created by Pontes and Griffiths (2015) as a nine-item

self-reported tool assessing IGD symptoms and severity using the APA framework

(Wu et al., 2023). The aim of the instrument is to assess IGD's severe consequences

by measuring online and offline gaming activities existing over a 12-month period

(Pontes & Griffiths, 2015). The nine items consisted by IGDS9-SF include: '1)

preoccupation with gaming, 2) withdrawal symptoms, 3) tolerance, 4) unsuccesfull

attempts to reduce or quit gaming, 5) loss of interest on previous activities or

entertainments as a result of (and with the exception of) gaming, 6) continuing to

gaming despite knowing the associated psychosocial problems, 7) deceiving family members, therapists, or others about the amount of time spent on gaming, 8) playing video games to evade or relieve negative moods and 9) jeopardizing or losing a meaningful relationship, job, educational or employment opportunity due to gaming' (Beranuy et al., 2020). The questions are answered through a 5-point Likert scale: 1("Never"), 2("Rarely"), 3("Sometimes"), 4("Often"), and 5("Very Often"). The scores are calculated by summing all items and the results might range from 9 to 45. Higher scores indicate higher degrees of gaming disorder (Pontes & Griffiths, 2015). Although the main purpose of the instrument is not to diagnose IGD but only to assess detrimental effects, it is being used to classify gamers from non-disordered to disordered (Pontes & Griffiths, 2015). In the current study the IGDS9-SF presented with a high internal consistency (Cronbach's α= .87 and ω= .88).

Gaming Disorder Test (GDT)

The brief, standardised Gaming Disorder Test (GDT) is an evaluation instrument that consists of four items asking participants about their digital gaming activity in the previous year (both offline and online) (Pontes at al., 2019). GDT is based on the WHO criteria for GD and it is measuring the severity of GD (Pontes at al., 2019). All items are answered based on a 5-point Likert scale rated as: 1 (never), 2 (rarely), 3 (sometimes), 4 (often), and 5 (very often) (Wu et al., 2023). GDT total scores are calculated by summing all items and the answers can range from 4 to 20, with higher scores indicating higher degrees of disordered gaming (Pontes at al., 2019).

Problematic Internet Use Questionnaire (PIUQ-9)

PIUQ-9 is a self-report screening instrument for problematic internet use. PIUQ-9 was developed to measure the main aspects of problematic internet use (Laconi et al., 2019). The short scale consists of a bi-factor structure including one general problem and two-specific factors of obsession, neglect and control disorder. The severity of PIU is assessed through a five-point Likert scale starting from "never" to "always/almost always". The sum score of the questionnaire ranges from 9 to 45. Higher score reflects a higher risk of PIU (Burkauskas et al., 2020).

Procedure

The Greek versions of IGDS9-SF and GDT were created according to standard guidelines. First, two forward translations of Greek versions for each of IGDS9-SF and GDT were produced independently by two bilingual native Greek-English speakers and then composed into one consensual forward translation for every scale, after discussions between the two bilingual speakers. Then, the unified IGDS9-SF and GDT Greek versions were back translated into English by a third bilingual Greek-English speaker. Finally, the backward translations were compared to the original versions and were found to be consistent and congruent to them. The unified forward translations were then discussed by the translators and a number of ten people in order to achieve linguistic and conceptual equivalency for the final Greek versions of the IGDS9-SF and GDT. They all found the final Greek versions of IGDS9-SF and GDT to be comprehensible and coherent, easy to understand, straightforward and clear.

Therefore, there were no items revised for cultural adaptation.

The participants could access the online survey, which was publicized at social media (e.g., Linkedin, group conversations at Whatsapp, Viber)**.** All participants were informed of the study's objectives, inclusion criteria, and additional relevant information from the outset. Participants were required to provide electronic informed consent to participate. All participants provided anonymous sociodemographic information and completed the Internet Gaming Disorder Scale Short-Form (IGDS9-SF), Gaming Disorder Test (GDT) and Problematic Internet Use Questionnaire (PIUQ-9). Participants were eligible to participate if they were adults and Greek was their native language.

Data Analysis

Data analyses were completed with the use of Jamovi v. 2.3. Descriptive statistics were obtained for the IGDS9-SF, GDT and PIUQ-9, along with PIUQ-9 (factor of obsession and factor of neglect/control disorder).

Confirmatory factor analysis was performed with maximum likelihood to examine the factor structure of IGDS9-SF. The IGDS9-SF was consistently found to be a single-factor model in previous validation studies. As with other language versions, it is expected that the one-factor model IGDS9-SF would present a good fit to the present sample. Multiple goodness-of-fit indexes were used to evaluate the one-factor IGDS9-SF model: Ratio of Chi-Square to the Degrees of Freedom ($\chi 2/df$), Comparative Fit Index (CFI), Tucker Lewis Index (TLI), Standardized Root Mean Square Residual (SRMR), and Root Mean Square Error of Approximation (RMSEA).

A $\chi2/df$ ratio of less than 3 represents a food model fit (Kline, 2023). CFI values

of .90 or above are described as a good fit (Fabrigar et al., 1999). The same holds for

TLI. RMSEA values less than .05 are described as good, values between .05 and .08

as acceptable, values between .08 and .1 as marginal, and values greater than .1 as

poor (Ling et al., 2021).

We used Cronbach alpha (α) and omega (ω) to assess internal reliability.

As GDT represents an established scale for assessing IGD (the same construct of

interest), it was used to establish concurrent validity for IGDS9-SF for the present

study. To this end, we examined the Pearson's *r* correlations between IGDS9-SF and

GDT. There is a strong correlation between problematic internet use and IGD,

indicating a theoretical relationship between these two concepts. In this study,

PIUQ-9, which is specifically created to assess problematic internet use, was used to

establish the convergent validity of IGDS9-SF.

Results

Descriptive statistics

In terms of gameplay frequency the results are listed on table 1.

Table 1

Hours of gaming per day

Daily gameplay	N	%
Zero to half an hour	121	48%
1-2 hours	93	36.9%
3-5 hours	32	12.7%
6+ hours	6	2.9%

The results for years of playing games are listed on table 2. The biggest

percentage 29.1% represents the number of people playing games for between 11-20

years. 21-30 years had also a big percentage as it was at 15.6%.

Table 2

Years of game playing

Years of gaming	N	%
0	61	24.2%
1-5 years	36	14%
6-10 years	40	15.9%
11-20 years	73	29.1%
21-30 years	39	15.6%
31-40 years	3	1.2%

At table 3 are shown means, standard deviations and internal consistency coefficients of the three variables used in the study. IGDS9-SF's mean was 14 (SD=5.3).

Table 3

Means, Standard Deviations and Internal Consistency Coefficients

Variables	M	SD	Alpha	Omega
IGDS9-SF	14.20	5.30	.87	.88
GDT	5.35	2.19	.83	.84
PIUQ-9	22.27	7.44	.90	.90
PIUQ-9-OBS	5.99	2.32	.65	.67
PIUQ-9-NGL-CNTRL	16.28	5.47	.87	.87

Note: IGDS9-SF= Internet Gaming Disorder Scale Short Form, GDT= Gaming

Disorder Test, PIUQ9= Problematic Internet Use Questionnaire, PIUQ9-OBS=

Problematic Internet Use Questionnaire (factor of Obsession), PIUQ9-NGL-CNTRL=

Problematic Internet Use Questionnaire (factor of Neglect and Control Disorder)

Construct validity

A CFA (confirmatory factor analysis) was performed on the nine items of the

IGDS9-SF using the maximum likelihood estimation method with robust standard

errors (MLR) to test the one-factor solution of the IGD construct as previously

established. The initial confirmatory factor analysis (CFA) revealed a poor fit of the

model to the data, as evidenced by a significant chi-square value ($\chi2$=120, df=27,

p<.001) (table 4). Chi-square is highly susceptible to the impact of the sample size as

the larger the sample is the more likely the results of the test become significant.

Table 4
Fit indices

				RMSEA 90% Cl	
CFI	TLI	SRMR	RMSEA	Lower	Upper
.904	.872	.0534	.117	.0962	.139

Upon further examination to the modification indices, it was identified that

allowing the error terms of the observed variables 2-4 and 6-7 to covary could

improve the model fit. Based on this, a modification was made to the model by

freeing the error term covariance. The revised model was reanalyzed, and the fit

indices improved significantly: CFI=.957, TLI=.938, SRMR=0,041, RMSEA=.081,

90% Cl [.058, 0.106] (table 5). These results suggest that the revised model provides a

better fit to the data.

Table 5

Fit indices

| CFI | TLI | SRMR | RMSEA | RMSEA 90% Cl | |
				Lower	Upper
.957	.938	.041	.082	.059	.106

All items loaded significantly on the IGD construct except for item 7 and item 9.

Factor loadings are provided at table 6 and the path diagram at table 7.

Table 6

Factor loadings

| Factor | Indicator | Estimate | SE | 95% CI | | Z | p | St. Estim. |
				Lower	Upper			
Factor 1	IGD1	.750	.0557	.641	.859	13.46	<.001	.757
	IGD2	.586	.0440	.500	.673	13.33	<.001	.752
	IGD3	.803	.0566	.692	.914	14.19	<.001	.787
	IGD4	.587	.0492	.490	.683	11.94	<.001	.696
	IGD5	.598	.0485	.503	.693	12.34	<.001	.714
	IGD6	.534	.0469	.442	.626	11.39	<.001	.670
	IGD7	.187	.0269	.134	.239	6.92	<.001	.444
	IGD8	.695	.0672	.564	.827	10.35	<.001	.620
	IGD9	.203	.0256	.153	.253	7.95	<.001	.498

Table 7

Path diagram
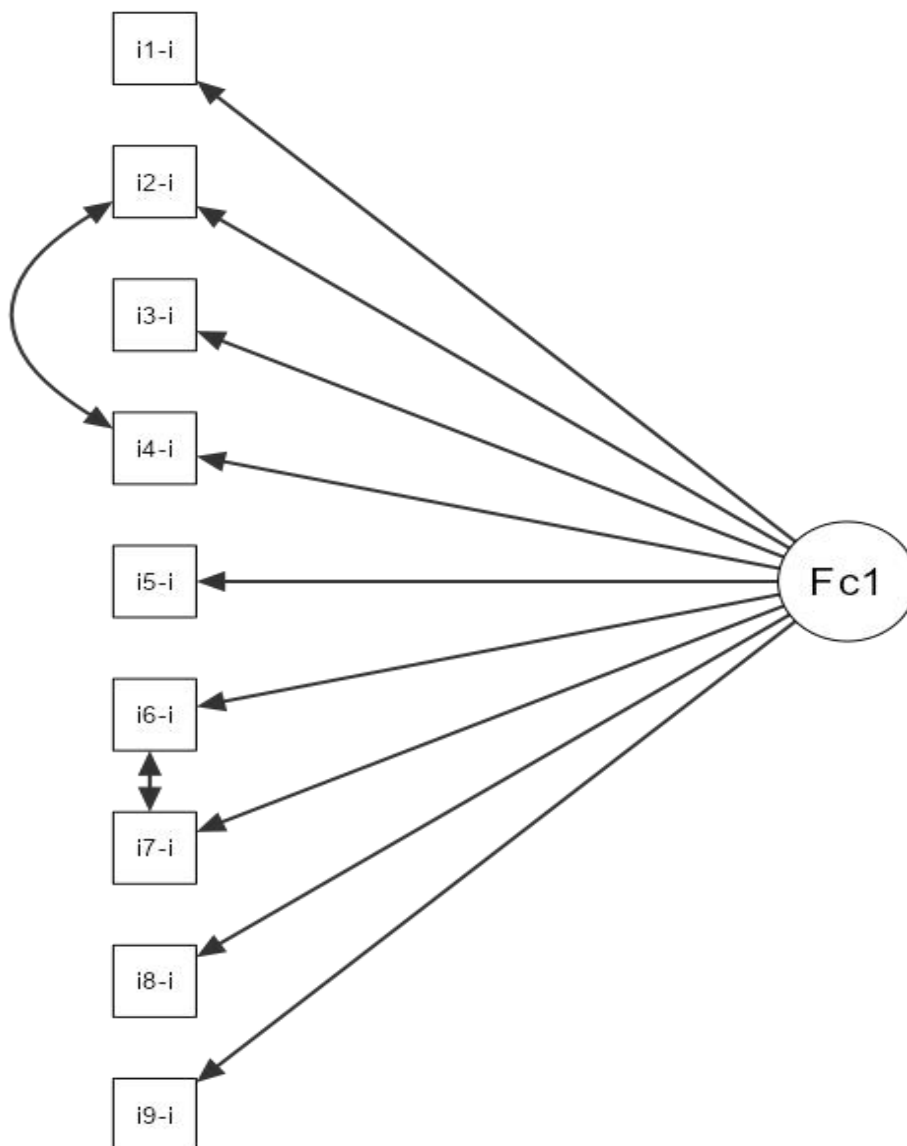
Reliability

Internal consistency

Internal reliability was assessed using two measures, Cronbach's alpha and

McDonald's omega, to evaluate the reliability of the IGDS9-SF scale. The

Cronbach's alpha coefficient for the scale was found to be α=.87 indicating good

internal consistency among the items. A Cronbach's alpha value above .70 is

generally considered acceptable for research purposes, suggesting that the items in the

scale are measuring the same underlying construct consistently (Dunn et al., 2014).

Additionally, McDonald's omega coefficient was calculated to further assess internal

consistency. The omega coefficient for the scale was .88 providing additional

evidence of the reliability of IGDS9-SF. McDonald's omega is considered to be a

more appropriate measure of internal consistency when dealing with non-perfectly

tau-equivalent measures (Dunn et al., 2014). The high values of both Cronbach's

alpha and McDonald's omega suggest that the items in the scale are reliable and

consistently measure IGD. This indicates that IGDS9-SF is internally consistent and

can be considered a reliable tool for assessing IGD.

Test-retest reliability

Test-retest reliability was assessed to evaluate the consistency and stability of

IGDS9-SF scale over time. The scale was administered to the same group of

participants on two separate occasions, with a two-week interval between the test and

retest administration. Out of the 252 participants, we received 81 full responses.

The Pearson correlation coefficient between the initial administration of the

IGDS9-SF scale and the retest administration was found to be r=.85, p<.001,

indicating a strong positive correlation between the two administrations. This high

correlation coefficient suggests that the IGDS9-SF scale demonstrates good stability

and validity over time.

The findings indicate that the IGDS9-SF scale is stable and reliable,

demonstrating good test-retest reliability. Researchers can have confidence in the

consistency of the scale's measurement properties over time, allowing for reliable

assessment of IGD in future studies.

Convergent validity

Convergent validity was assessed to examine the extent to which the three scales

that theoretically should be related are indeed correlated. In this study, convergent

validity was evaluated by examining the relationships between IGDS9-SF, GDT and

PIUQ-9. The Pearson correlation coefficient between the IGDS9-SF and GDT was

found to be r=.85, p<.001 indicating a strong positive correlation between the two

scales. According to Cohen (2013) a correlation coefficient above .50 is considered to

demonstrate good convergent validity, suggesting that the measures are capturing

related aspects of the underlying construct.

A positive correlation was found between IGDS9-SF and PIUQ-9, with a Pearson

correlation coefficient of r=.43, p<.001 with the two factors (obsession r=.48, p<.001,

neglect and control disorder r=.38, p<.001) showing positive correlation. While the

correlation was statistically significant, the strength of the relationship between

IGDS9-SF and PIUQ-9 was modest. This suggests that there is a positive but

relatively weak relationship between gaming disorder and problematic internet use.

Table 8

Correlations between IGDS9-SF and GDT, PIUQ-9: convergent validity

VARIABLES	IGD
GDT	.85
PIUQ-9	.43
PIUQ-9-OBS	.48
PIUQ-9-NGL-CTRL	.38

Discussion

The IGDS9-SF is one of the most widely used psychometric tests for measuring IGD as it had the greatest number of adaptations to different languages and cultural contexts (Beranuy et al., 2020). The aim of the present study was to develop and investigate the psychometric properties of the Greek IGDS9-SF in an attempt to create a valid and reliable instrument within the Greek cultural context. For this purpose, a sample of Greek adults was used and IGDS9-SF was assessed in terms of validity and reliability.

Construct validation was conducted by means of CFA. In general, the findings from the CFA support previous research indicating that IGD can be effectively assessed by IGDS9-SF within a single latent construct with adequate goodness of fit. Nevertheless, it is important to highlight that prior psychometric studies on IGDS9-SF in different countries have shown higher factor loadings for two of the nine items, specifically for items 7 (i.e., have you deceived any of your family members, therapists or others because the amount of your gaming activity?) and 9 (i.e., have you jeopardized or lost an important relationship, job or an educational or career opportunity because of your gaming activity?). Various possible explanations exist for these results observed regarding these specific items.

The tendency to conceal the extent of gaming time is more noticeable among children and adolescents, often as a means to mislead their parents (item 7). Griffiths (2016) has raised concerns that this behavior could be subjective, reflecting parental perceptions rather than a true symptom of IGD. Nonetheless, this criterion is

defensible as it can aid in pinpointing youth with problematic gaming habits

exhibiting signs of misconduct or defiance. Furthermore, there is a suggestion to

eliminate the item related to deception as it might not effectively distinguish between

individuals with disordered gaming behaviors and those without (Severo et al., 2020).

The deception criterion should stem from self-censorship, where gamers may be

concerned about how their actions are perceived by those close to them, such as

fearing reactions if they were to disclose engaging in long hours of gameplay

consecutively.

For the criterion of associated to jeopardizing relationships/opportunities

(item 9) it has been noted that the wording of this criterion posed a challenge as it

combines personal and professional/educational losses in a single-question

(double-barreled question). Suggestions have been made to simplify this criterion by

focusing solely on negative impacts on academic or professional performance

(Griffiths et al., 2016). Dividing the item into two (one indicating the compromising

of education/occupation and the other reflecting the compromising of important

relationships) would be a way to increase its clinical relevance (Poon et al., 2021). It

has been argued that if articulated clearly in the instrument, this criterion can be

highly beneficial as it is crucial to identify problems stemming from IGD (Griffiths et

al., 2016).

Despite these points, all factor loadings were found to be positively associated

with a common underlying factor, further supporting the construct validity of

IGDS9-SF. However, the correlations observed on items 7 and 9 indicate that there is

still room for improvement in these items/clinical criteria.

In relation to other validity indicators, the present study aimed to evaluate the relationship between IGDS9-SF and instruments assessing conceptually similar psychological problems such as the GDT and PIUQ-9. The constructs IGDS9-SF and GDT refer to the same issue, so the results obtained indicated high correlations between these two, suggesting a convergent relationship. The results between IGDS9-SF and PIUQ-9 showed positive correlation but the relationship between these two was modest. A reason for this may be that the debate continues regarding whether IGD shares psychopathological traits with problematic internet use (Ling et al., 2021). The advent of IGDS9-SF opens doors for future exploration into the potential common developmental pathway between IGD and internet problematic internet use, crucial for shaping preventive and intervention strategies tailored to the specific population.

Given the pervasive nature of internet usage and gaming in our daily lives, there is an urgent call for further research in the realm of IGD. As the concept of IGD gains recognition as a possible new disorder, the necessity for a reliable and valid tool for clinical and research purposes becomes paramount. The IGDS9-SF emerges as a promising assessment instrument enabling researchers into IGD from a local context, enhancing the global understanding of IGD across cultures. Moreover, clinical practitioners can utilize this scale in routine practice for IGD screening, treatment planning and evaluation, when deemed appropriate.

Limitations and future research

The study has various limitations that warrant discussion. Firstly, the IGDS9-SF is a self-report psychometric instrument, and self-reported data are susceptible to a range of known biases, including social desirability and memory recall biases from the participants who completed it. Participants were recruited based on their availability (convenience sample).

The study was restricted to adult Greek-speaking participants. Different results may occur for children and adolescents. Future studies should further examine the psychometric properties of the scale in samples that are more demographically diverse.

Future validation studies involving normative samples and clinical populations are essential to identify clinically significant distinctions between hazardous gamers, excessive gamers, and disordered gamers, thereby improving the diagnostic accuracy of IGDS9-SF. Additionally, future research should also prioritize investigating games' characteristics to delve deeper into the study of internet gaming disorder. With the advancements in various game types, the characteristics of games have come under scrutiny as they could play a role in the psychological mechanism behind excessive gaming (Guan, & Chen, 2023). According to Griffiths (2012), the primary factor for IGD lies in the characteristics of each game.

Conclusions

In conclusion, the present study has helped expanding research on the assessment of IGD using the IGDS9-SF. Overall, the results provided support for the validity and reliability of IGDS9-SF and are expected to lay the groundwork for future research on IGD in Greece. The present findings support the use of IGDS9-SF for early diagnosis of IGD and will be useful for psychological care units.

REFERENCES

American Psychiatric Association. (2013). *Diagnostic and statistical manual of*

   mental disorders. Arlington, VA: American Psychiatric Publishing.

   https://doi.org/10.1176/appi.books.9780890425596.

Beranuy, M., Machimbarrena, J. M., Vega-Oses, M. A., Carbonell, X., Griffiths, M.

   D., Pontes, H. M., & Gonzalez-Cabrera, J., (2020). Spanish validation of the

   internet gaming disorder scale-short form (IGDS9-SF): Prevalence and

   relationship with online gambling and quality of life. *International Journal of*

   Environmental Research and Public Health, 17(5), 1562.

   https://doi.org/10.3390/ijerph17051562.

Billieux, J., Thorens, G., Khazaal, Y., Zullino, D., Achab, S., & Van der Linden, M.,

   (2015). Problematic involvement in online games: A cluster analytic approach.

   Computers in Human Behavior, 43, 242-250.

   https://doi.org/10.1016/j.chb.2014.10.055.

Burén, J, Nutley, S. B., Thorell, L. B., (2023). Screen time and addictive use of

   gaming and social media in relation to health outcomes. *Frontiers in Psychology,*

   14 1258784. https://doi.org/10.3389/fpsyg.2023.1258784.

Burkauskas, J., Kiraly, O., Demetrovics, Z., Podlipskyte, A., & Steibliene, V., (2020).

   Psychometric properties of the nine-item Problematic Internet Use Questionnaire

   (PIUQ-9) in a Lithuanian sample of students. *Frontiers in Psychiatry, 11*, 565769.

   https://doi.org/10.3389/fpsyt.2020.565769.

Chen, I. H., Strong C., Lin, Y., C, Tsai, M. C., Leung, H., Lin, C. Y., ... & Griffiths,

M. D., (2020). Time invariance of three ultra-brief internet-related instruments: Smartphone application-based addiction scale (SABAS), Bergen social media addiction scale (BSMAS), and the nine-item internet gaming disorder scale-short form (IGDS-SF9)(study Part B). *Addictive Behaviors, 101*, 105960. https://doi.org/10.1016/j.addbeh.2019.04.018.

Cohen, J., (2013). *Statistical power analysis for the behavioral sciences.* Routledge.

De Palo, V., Monacis, L., Sinatra, M., Griffiths, M. D., Pontes, H., Petro, M., & Miceli, S., (2019). Measurement invariance of the nine-item Internet Gaming Disorder Scale (IGDS9-SF) across Albania, USA, UK and Italy. *International Journal of Mental Health and Addiction, 17,* 935-946. https://doi.org/10.1007/s11469-018-9925-5.

Dunn, T. J., Baguley, T., & Brunsden, V., (2014). From alpha to omega: A practical solution to the pervasive problem of internal consistency estimation. *British Journal of Psychology, 105*(3), 399-412. https://doi.org/10.1111/bjop.12046.

Evren, C., Dalbudak, E., Topcu, M., Kutlu, N., Evren, B., & Pontes, H. M., (2018). Psychometric validation of the Turkish nine-item internet gaming disorder scale-short form (IGDS9-SF). *Psychiatry Research, 265,* 349-354. https://doi.org/10.1016/j.psychres.2018.05.002.

Fabrigar, L. R., Wegener, D. T., MacCallum, R. C., & Strahan, E. J., (1999). Evaluating the use of exploratory factor analysis in psychological research. *Psychological Methods, 4*(3), 272. https://doi.org/10.1037//1082-989x.4.3.272.

Gao, Y. X., Wang, J. Y., & Dong, G. H., (2022). The prevalence and possible risk

factors of internet gaming disorder among adolescents and young adults:

Systematic reviews and meta-analyses. *Journal of Psychiatric Research, 154,*

35-43. https://doi.org/10.1016/j.jpsychires.2022.06.049.

Griffiths, M. (2005). A 'components' model of addiction within a biopsychosocial

framework. *Journal of Substance Use, 10*(4), 191–197.

https://doi.org/10.1080/14659890500114359.

Griffiths, M. D., Kuss, D. J., & King, D., L., (2012). Video game addiction: Past,

present and future. *Current Psychiatry Reviews, 8*(4), 308-318.

https://doi.org/10.2174/157340012803520414.

Griffiths, M. D., Kuss, D. J., Lopez-Fernandez, O., & Pontes, H. M., (2017).

Problematic gaming exists and is an example of disordered gaming: Commentary

on: Scholars' open debate paper on the World Health Organization ICD-11

Gaming Disorder Proposal (Aarseth et al.). *Journal of Behavioral Addictions,*

6(3), 296-301. https://doi.org/10.1556/2006.6.2017.037.

Griffiths, M. D., Van Rooij, A. J., Kardefelt-Winther, D., Starcevic, V., Kiraly, O.,

Pallesen, S., ... Demetrovics, Z., (2016). Working towards an international

consensus on criteria for assessing Internet gaming disorder: A critical

commentary on Petry et al.(2014). *Addiction, 111*(1), 167.

https://doi.org/10.1111/add.13057.

Guan, J., & Chen, T., (2023). Exploring addiction mechanism of different game types.

Journal of Education, Humanities and Social Sciences, 8, 1490-1496.

https://doi.org/10.54097/ehss.v8i.4509.

Jeromin, F., Rief, W., & Barke, A., (2016). Validation of the internet gaming disorder

    questionnaire in a sample of adult German-speaking internet gamers.

    Cyberpsychology, Behavior and Social Networking, 19(7), 453-459.

    https://doi.org/10.1089/cyber.2016.0168.

Hong, Y. N., Hwang, H., Starcevic, V., Choi, T. Y., Kim, T. H., & Han, D. H., (2023).

    Which is more stable and specific: DSM-5 internet gaming disorder or ICD-11

    gaming disorder? A longitudinal study. *Psychiatry and Clinical Neurosciences,*

    77(4), 231-222. https://doi.org/10.1111/pcn.13522.

Kline, R. B., (2023). *Principles and practice of structural equation modeling.*

    Guilford Publications. https://doi.org/10.1080/10705511.2012.687667.

Kim, B. N., & Ko, H., (2020). Psychometric properties of the nine-item Korean

    internet gaming disorder scale: short form. *Cyberpsychology, Behavior and*

    Social Networking, 23(12), 854-859. https://doi.org/10.1089/cyber.2020.0227.

Kim, H. S., Son, G., Roh, E. B., Ahn, W. Y., Kim, J., Shin, S. H., ..., & Choi, K. H.,

    (2022). Prevalence of gaming disorder: A meta-analysis. *Addictive behaviors,*

    126, 107183. https://doi.org/10.1016/j.addbeh.2021.107183.

Kuss, D. J., Shorter, G. W., van Rooij, A. J., van de Mheen, D., & Griffiths, M. D.,

    (2014). The internet addiction components model and personality: Establishing

    construct validity via a nomological network. *Computers in Human Behavior, 39*,

    312-321. https://doi.org/10.1016/j.chb.2014.07.031.

Kiraly, O., Griffiths, M.D., Urban, R., Farkas, J., Kokonyei, G., Elekes, Z., ..., &

    Demetrovics, Z., (2014). Problematic Internet use and problematic online gaming

are not the same: Findings from a large nationally representative adolescent

sample. *Cyberpsychology, Behavior and Social Networking, 17*(12), 749-754.

https://doi.org/10.1089/cyber.2014.0475.

Laconi, S., Rodgers, R. F., & Chabrol, H., (2014). The measurement of Internet

addiction: A critical review of existing scales and their psychometric properties.

Computers in Human Behavior, 41, 190-202.

https://doi.org/10.1016/j.chb.2014.09.026.

Laconi, S., Urban, R., Kaliszewska-Czeremska, K., Kuss, D. J., Gnisci, A., Sergi, I., ...

& Kiraly, O., (2019). Psychometric evaluation of the nine-item Problematic

Internet Use Questionnaire (PIQU-9) in nine European samples of internet users.

Frontiers in Psychiatry, 10, 429404. https://doi.org/10.3389/fpsyt.2019.00136.

Leung, H., Pakpour, A. H., Strong, C., Lin, Y. C., Tsai, M. C. Griffiths, M. D., ... &

Chen, I. H., (2020). Measurement invariance across young adults from Hong

Kong and Taiwan among three internet-related addiction scales: Bergen social

media addiction scale (BSMAS), smartphone application-based addiction scale

(SABAS), and internet gaming disorder scale-short form (IGDS-SF9) (study Part

A). *Addictive behaviors, 101*, 105969.

https://doi.org/10.1016/j.addbeh.2019.04.027.

Ling, S. L., Nik Jafaar, N. R., Tan, K. A., Bahar, N., Baharudin, A., & Ahmad,

Tajjudin, A. I., (2021). Psychometric properties of the Malay version of the

Internet Gaming Disorder Scale-Short Form (IGDS9-SF-M): Evidence from a

sample of Malaysian undergraduates. *International Journal of Environmental*

Research and Public Health, 18(5), 2592.

https://doi.org/10.3390/ijerph18052592.

Mentzoni, R. A., Brunborg, G. S., Molde, H., Myrseth, H., Skouveroe, K. J. M.,

Hetland, J., &Pallesen, S., (2011). Problematic video game use: Estimated

prevalence and associations with mental and physical health. *Cyberpsychology,*

Behavior, and Social Networking, 14(10), 591-596.

https://doi.org/10.1089/cyber.2010.0260.

Monacis, L., Palo, V. D., Griffiths, M. D., & Sinatra, M., (2016)., Validation of the

internet gaming disorder scale-short-form (IGDS9-SF) in an Italian speaking

sample. *Journal of Behavioral Addictions, 5*(4), 683-690.

https://doi.org/10.1556/2006.5.2016.083.

Montag, C., Schivinski, B., Sariyska, R., Kannen, C., Demetrovics, Z., & Pontes, H.

M., (2019). Psychopathological symptoms and gaming motives in disordered

gaming- A psychometric comparison between the WHO and APA diagnostic

frameworks. *Journal of Clinical Medicine, 8*(10), 1691.

https://doi.org/10.3390/jcm8101691.

Pontes, H. M. & Griffiths, M. D., (2016). Portuguese validation of the internet gaming

disorder scale-short-form. *Cyberpsychology, Behavior and Social Networking,*

19(4), 288-293. https://doi.org/10.1089/cyber.2015.0605.

Pontes, H. M., & Griffiths, M. D., (2015). Measuring DSM-5 internet gaming

disorder: Development and validation of a short psychometric scale. *Computers*

in Human Behavior, 45, 137-143. https://doi.org/10.1016/j.chb.2014.12.006.

Pontes, H. M., Macur, M., & Griffiths, M. D., (2016). Internet gaming disorder among Slovenian primary schoolchildren: Findings from a nationally representative sample of adolescents. *Journal of Behavioral Addictions, 5*(2), 304-310. https://doi.org/10.1556/2006.5.2016.042.

Pontes, H. M., Schivinski, B., Kannen, C., & Montag, C., (2022). The interplay between time spent gaming and disordered gaming: A large-scale world-wide study. *Social Science & Medicine, 296*, 114721. https://doi.org/10.1016/j.socscimed.2022.114721.

Pontes, H. M., Schivinski, B., Sindermann, C., Li, M., Becker, B., Zhou, M., & Montag, C., (2021). Measurement and conceptualization of Gaming Disorder according to the World Health Organization framework: The development of gaming disorder Test. *International Journal of Mental Health and Addiction, 19,* 508-528. https://doi.org/10.1007/s11469-019-00088-z.

Pontes, H. M., Stavropoulos, V., & Griffiths, M. D., (2017). Measurement invariance of the internet gaming disorder scale-short-form (IGDS9-SF) between the United States of America, India and the United Kingdom. *Psychiatry Research, 257*, 472-478. https://doi.org/10.1016/j.psychres.2017.08.013.

Poon, L. Y., Tsang, H. W., Chan, T. Y., Man, S. W., Ng, L. Y., Wong, Y. L., ... & Pakpour, A. H., (2021). Psychometric properties of the internet gaming disorder scale-short-form (IGDS9-SF): Systematic review. *Journal of Medical Internet Research, 23*(10), e26821. https://doi.org/10.2196/26821.

Przybylski, A. K., Rigby, C. S., & Ryan, R. M., (2010). A motivational model of

video game engagement. *Review of General Psycology, 14*(2), 154-166.

https://doi.org/10.1037/a0019440.

Rosenkranz, T., Muller, K. W., Dreier, M., Beutel, M. E., & Wolfling, K., (2017).

Addictive potential of internet applications and differential correlates of

problematic use on internet gamers versus generalized internet users in a

representative sample of adolescents. *European Addiction Research, 23*(3),

148-156. https://doi.org/10.1159/000475984.

Salvarli, S. I., & Griffiths, M., D., (2021). Internet gaming disorder and its associated

personality traits: A systematic review using PRISMA guidelines. *International

Journal of Mental Health and Addiction, 19*, 1420-1442.

https://doi.org/10.1007/s11469-019-00081-6.

Schivinski, B., Brzozowska-Woś, M., Buchanan, E. M., Griffiths, M. D., & Pontes, H.

M. (2018). Psychometric assessment of the internet gaming disorder diagnostic

criteria: An item response theory study. *Addictive behaviors reports, 8*, 176-184.

https://doi.org/10.1016/j.abrep.2018.06.004.

Severo, R. B., Barbosa, A. P. P. N., Fouchy, D. R. C., da Cunha Coelho, F.M.,

Pinheiro, R. T., de Figueiredo, V. L. M., ... & Pinheiro, K. A. T., (2020).

Development and psychometric validation of internet gaming disorder

scale-short-form (IGDS9-SF) in a Brazilian sample. *Addictive Behaviors, 103,*

106191. https://doi.org/10.1016/j.addbeh.2019.106191.

Starcevic, V., Aarseth, E., Bean, A. M., Boonen, H., Carras, M., Coulson, M., ... &

Edman, J., (2017). Scholars' open debate paper on the World Health Organization

ICD-11 gaming disorder proposal. https://doi.org/10.1556/2006.5.2016.088.

Stavropoulos, V., Beard, C., Griffiths, M. D., Buleigh, T., Gomez, R., & Pontes, H. M., (2018). Measurement invariance of the internet disorder gaming scale-short-form (IGDS9-SF) between Australia, the USA and the UK. *International journal of mental health and addiction, 16,* 377-392. https://doi.org/10.1007/s11469-017-9786-3.

Suchá, J. (2018). Hraní digitálních her českými adolescenty. Univerzita Palackého v Olomouci. https://doi.org/10.5507/ff.18.24454245.

Sussman, C. J., Harper, J. M., Stahl, J. L., & Weigle, P., (2018). Internet andvideo game addictions: Diagnosis, epidemiology, and neurobiology. *Child and Adolescent Psychiatric Clinics, 27*(2), 307-326. https://doi.org/10.1016/j.chc.2017.11.015.

World Health Organization (WHO), 11th revision of the International Classification of Diseases and Related Health Problems (ICD-11). https://icd.who.int/en.

Wu, T. Y., Lin, C. Y., Arestedt, K., Griffiths, M. D., Brostrom, A., & Pakpour, A. H., (2017). Psychometric validation of the Persian nine-item Internet Gaming Disorder Scale-Short Form: Does gender and hours spent online gaming affect the interpretations of items descriptions?. *Journal of Behavioral Addictions, 6*(2), 256-263. https://doi.org/10.1556/2006.6.2017.025.

Wu, T., Y., Huang, S., W., Chen, J., S., Ruckwongpatr, K., Kukreti, S., Strong, C.,...& Parkour, A., H., (2023). Translation and validation of the Gaming Disorder Test and Gaming Disorder Scale for adolescents into Chinese for Taiwanese young

adults. *Comprehensive Psychiatry, 124*, 152396.

https://doi.org/10.1016/j.comppsych.2023.152396.

Yam, C. W., Pakpour, A. H., Griffiths, M. D., Yau. W. Y., Lo, C. L. M., Ng, J. M., ...

& Leung, G. H., (2019). Psychometric testing of three Chinese online-related

addictive behavior instruments among Hong Kong university students.

Psychiatric Quarterly, 90, 117-128. https://doi.org/10.1007/s11126-018-9610-7.

Yen, J. Y., Higuchi, S., Lin, P. Y., Lin, P. C., Chou, W. P., & Ko, C. H., (2022).

Functional impairment, insight and comparison between criteria for gaming disorder

in the International Classification of Diseases, and internet gaming disorder in

Diagnostic and Statistical Manual of Mental Disorders. *Journal of Behavioral*

Addictions, 11(4), 1012-1023. https://doi.org/10.1556/2006.2022.00079.

Appendix

Internet Gaming Disorder Scale-Short Form (IGDS9-SF) (Pontes & Griffiths,

2015), Greek Version

Κλίμακα Μέτρησης Διαταραχής Διαδικτυακού Παιχνιδιού

Οι ερωτήσεις αφορούν στη δραστηριότητα σας σε παιχνίδια τον τελευταίο χρόνο

(δηλαδή τους τελευταίους 12 μήνες). Με τον όρο 'δραστηριότητα παιχνιδιού'

εννοούμε κάθε δραστηριότητα σχετική με παιχνίδι από σταθερό/φορητό υπολογιστή,

από κονσόλα παιχνιδιού ή από οποιαδήποτε άλλη συσκευή (πχ. κινητό τηλέφωνο,

τάμπλετ κλπ), είτε με σύνδεση στο διαδίκτυο είτε εκτός σύνδεσης.

1	2	3	4	5
Ποτέ	Σπάνια	Κάποιες Φορές	Συχνά	Πολύ Συχνά

1. Σας απασχολεί η συμπεριφορά σας σχετικά με την δραστηριότητα σας σε παιχνίδια; (Για παράδειγμα σκέφτεστε προηγούμενες φορές που παίξατε ή ανυπομονείτε για το επόμενο παιχνίδι; Πιστεύετε ότι τα παιχνίδια έχουν γίνει ένα κυρίαρχο κομμάτι της καθημερινότητας σας;)	1	2	3	4	5
2. Νιώθετε περισσότερο εκνευρισμό, άγχος ή και λύπη όταν προσπαθείτε να ελαττώσετε ή να σταματήσετε την δραστηριότητα σας σε	1	2	3	4	5

παιχνίδια;					
3. Νιώθετε την ανάγκη να περνάτε περισσότερο χρόνο παίζοντας για να νιώσετε ικανοποίηση ή ευχαρίστηση;	1	2	3	4	5
4. Αποτυγχάνετε συστηματικά όταν προσπαθείτε να ελέγξετε ή να σταματήσετε την δραστηριότητα σας στα παιχνίδια;	1	2	3	4	5
5. Έχετε χάσει το ενδιαφέρον σας σε χόμπι και άλλες δραστηριότητες ψυχαγωγίας λόγω της προσήλωσης σας στα παιχνίδια;	1	2	3	4	5
6. Έχετε συνεχίσει την δραστηριότητα σας σε παιχνίδια παρόλο που γνωρίζετε ότι δημιουργούσε προβλήματα μεταξύ σας και άλλων ατόμων;	1	2	3	4	5
7. Έχετε εξαπατήσει μέλη της οικογένεια σας, θεραπευτές ή άλλους εξαιτίας της διάρκειας της δραστηριότητας σας σε παιχνίδια;	1	2	3	4	5
8. Παίζετε με σκοπό να ξεφύγετε ή να ανακουφίσετε κάποια αρνητική διάθεση (πχ. ανημποριά, ενοχές, άγχος);	1	2	3	4	5
9. Έχετε διακινδυνεύσει ή χάσει κάποια σημαντική σχέση, δουλειά ή ακαδημαϊκή ή	1	2	3	4	5

επαγγελματική ευκαιρία εξαιτίας της δραστηριότητας σας σε παιχνίδια;					