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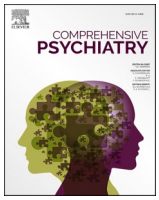

Translation and validation of the Portuguese version of the internet severity and activities addiction questionnaire (ISAAQ-10) towards the identification of problematic social media use: A population study

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ABSTRACT

Background: Problematic usage of the internet (PUI) refers to a pattern of internet use that results in negative consequences in an individual's life. It encompasses a broad spectrum of activities, which require assessment in terms of both severity and diversity, for a comprehensive understanding. This study aimed to translate the Internet Severity and Activities Questionnaire (ISAAQ-10) into Portuguese, to analyze its psychometric properties and to explore the validity of the ISAAQ-10 social networking use activity score towards identifying problematic social media use.

Methods: A snowball sampling method was used, with participants completing an online survey comprising sociodemographic questions and the Portuguese versions of the ISAAQ-10, Internet Addiction Test-10 (IAT-10), Internet Gaming Disorder Scale–Short-Form (IGDS9-SF), and Bergen Social Media Addiction Scale (BSMAS). The psychometric analysis included internal reliability testing using Cronbach's *alphas* and test-retest reliability, a confirmatory factor analysis (CFA), and convergent validity testing between the ISAAQ-10 and IAT-10. The concurrent validity of the ISAAQ-10 was also examined.

Results: A total of 590 young adults (85.1 % female), aged between 18 and 35 years, participated in this study. The ISAAQ-10 presented good internal consistency ($\alpha = 0.93$), with a test-retest correlation of $r = 0.865$; 95 % CI: 0.669–0.939. and a unidimensional structure that explained 48.3 % of the total variance. The convergent validity of the ISAAQ-10's total score was established through a high Pearson's correlation ($r = 0.574$; $p \leq .001$) with the IAT-10's total score. Pearson's correlations between the ISAAQ-10 gaming activity score and the IGDS9-SF ($r = 0.873$; $p < .001$), and between the ISAAQ-10 social networking use activity score and the BSMAS ($r = 0.670$; $p < .001$), respectively, supported the instrument's concurrent validity.

Conclusion: This work provides support for the Portuguese translation of the ISAAQ-10, which can be employed to identify the severity of problematic usage of the internet in a population sample. It also provides the first validation of the ISAAQ-10 social networking use activity score, which can be employed to identify problematic social media use within a predominately female university student sample. This study further establishes the ISAAQ-10 as a valid and reliable tool for population studies and, specifically, for the identification of problematic social media use.

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1. Introduction

The widespread availability of internet access has led to unparalleled opportunities for engaging in various online activities.

Digitalization has numerous benefits, including increased access to information, communication, leisure, and eHealth [1,2]. However, this increased accessibility can be accompanied also by the rise of problematic usage of the internet (PUI), which, in some cases, translates into repetitive, impairing online behaviours that could have negative consequences for the individual, including significant distress or significant impairment in personal, family, social, educational, occupational or other important areas of functioning [3–6].

PUI is an umbrella term for a growing range of maladaptive online behaviours expressed through excessive and compulsive use of the internet [3], including (but not limited to) gaming, overuse of social media, gambling, and pornography viewing [3,4,7], among others. Those behaviours may result in individual and societal detrimental consequences [5], constituting a matter of public concern [4,6]. The eleventh version of the International Classification of Diseases (ICD-11) [8] already recognizes a few behaviours as disorders with an online component, namely, the Gambling Disorder (6C50) and Gaming Disorder (6C51), and as an Impulse Control Disorder, such as the Compulsive Sexual Behaviour Disorder (6C72). The current version of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) [9] included Gambling Disorder in the new category of Substance-Related and Addictive Disorders, under the section Non-Substance-Related Disorders. However, Internet Gaming Disorder was included in Section III of the same manual as a condition that requires further studies. The other behaviours, such as excessive use of social media, compulsive online shopping, and cyberchondria (anxiety about health manifesting online), are still under debate about whether they need to be included in the classification manuals.

Problematic social media use is an important aspect of PUI [10,11]. In 2023, Portuguese users spent, on average, more than two and a half hours daily on social media platforms. The duration of the time spent on these platforms is significantly higher among younger individuals, approaching nearly three hours daily, which reflects a global usage pattern in this age group [12]. Although this may reflect recreational use within normal boundaries, it may also be problematic in some cases, if this use is characterized by a loss of control, possibly involving cognitive and affective biases, and is associated with a negative impact on health and daily functioning [13,14]. Within this growing reality, rigorous assessment tools for the problematic social media use and general PUI are required [10,15].

Screening tools that allow the assessment of the various online behaviours simultaneously, in a single instrument, such as the one proposed here, may be particularly useful, contributing to an advancement in the field. Excellent instruments do exist, mapping social media usage with ICD-11 criteria. The Assessment of Criteria for Specific Internet-use Disorders (ASCID-11) is an example [15,16], with the only main drawback being the instrument's length. Among the relatively shorter instruments to assess PUI are, the Internet Addiction Test (IAT) [17] and the psychometrically validated shortened version of the IAT (IAT-10) [18], all of which have shown relatively good psychometric properties in various settings.

The Internet Severity and Activities Questionnaire (ISAAQ) [19] and its shortened version (ISAAQ-10) [20] were developed to reflect recent theoretical conceptualizations, such as the one proposed in the I-PACE model [13], and include questions about core features of addiction but also other relevant concepts of impulsivity and compulsivity. The ISAAQ-10 has been designed to capture the overall severity of PUI conceptualized as a unidimensional quasi-trait (Part A of the instrument). The ISAAQ-10 also has the advantage of allowing a comprehensive assessment of the extent of engagement in a variety of specific online activities (e.g. online gaming, gambling or social media use, among others) through its Part B. The psychometric characteristics of the ISAAQ-10 have already been studied across three different countries, namely South Africa, the United Kingdom, and the United States of America [19]. Both versions (i.e., the ISAAQ and ISAAQ-10) exhibit good psychometric characteristics [19,20]. However, the shorter (10-item) version seems to retain good reliability at all levels of severity, while being more efficient in terms of length. In Portugal, there is a translated version of the IAT but not of the ISAAQ-10 [21].

In view of the above, and of the potential benefits of developing ISAAQ-10 versions for other languages, namely European Portuguese, the current study's goals were to 1) translate the ISAAQ-10 into Portuguese, 2) study the psychometric characteristics of the instrument among Portuguese university students, and 3) explore the validity of the ISAAQ-10 social networking use activity score towards identifying problematic social media use. Based on part B of the instrument, an analysis was also conducted on the nature and duration of involvement in specific potentially problematic internet activities among Portuguese university students and to compare 'high-PUI' and 'low-PUI' groups.

2. Material and methods

2.1. Participants and recruitment

Recruitment occurred via posts on social media platforms (Facebook, Instagram, Twitter), and through the social media of universities that agreed to disseminate the study. The study was also distributed through the mailing list of the lead author's university to students from undergraduate through doctoral levels. A snowball sampling technique was also used. Participants were invited to complete the survey and share it with their contacts. After they finished completing the survey, participants were asked if they were available to complete it a second time, to allow for the calculation of test-retest reliability. This option was voluntary and did not affect participation in the first phase of the study.

Inclusion criteria were being young adults aged between 18 and 35 years [22], residing in Portugal, and being internet users, which was the focus population for this study.

2.2. Instruments

Socio-demographic questionnaire: This questionnaire includes questions about age, gender, marital status, level of university enrolment (undergraduate level, Master's degree, or PhD), academic year, university program, use of social media, specific social media platforms used, average daily internet usage duration, and history of psychiatric or neurological diagnoses.

The Internet Severity and Activities Addiction Questionnaire-10 (ISAAQ-10) [20]: This scale aims to measure the severity of PUI in general and categorize the different internet activities in which this behaviour occurs. It is divided into two parts. Part A, or severity component, comprises a 10-item, 6-point Likert scale (0 = 'does not happen to me at all', 1 = 'rarely happens to me', 2 = 'occasionally happens to me', 3 = 'frequently happens to me', 4 = 'very often happens to me', 5 = 'happens to me all the time') assessing the severity of internet use, i.e., quantifying the extent of a user's involvement with the internet. Part B, or activities component, presents a collection of putatively problematic internet activities to measure the extent of engagement in specific online activities through a 6-point Likert scale (0–5). This part B assesses the activities performed online in the last 6 months: general surfing, internet gaming (including Massively-Multiplayer-Online-Role-Playing-Games), skills games and time-wasters, online shopping, online gambling, social networking, health and medicine (cyberchondria), online pornography, streaming media, and cyberbullying. The optimal one-factor structure of ISAAQ-10's severity scale (Part A) was established in a large dataset from South Africa and was validated afterward against datasets from the United Kingdom and the United States. The scale had a high Cronbach's *alpha* ($\geq$ 0.9) in each country.

In the current study, the translation of the ISAAQ-10 followed the guidelines of the American Educational Research Association (AERA), APA, and the National Council on Measurement in Education (NCME) for the translation and cultural adaptation of assessment instruments [23]. Two independent psychologists performed the translation, and conflicts were resolved with the help of a third one. A bilingual expert in Psychology, who was external to the team, performed the back-translation (Appendix 1). After obtaining the final version of the Portuguese translation, a pilot study was conducted with a sample of 60 participants for a semantic analysis. All participants responded that the version was fully understandable and, as a result, no modifications were made. In Portuguese it will be named *Questionário de Gravidade e Dependência de Atividades na Internet* (ISAAQ-10). The Internet Addiction Test (IAT) [17] (Portuguese version of Pontes et al. [21]): This self-report instrument comprises 20 items rated on a 6-point Likert scale (0 = 'not applicable', 1 = 'rarely', 2 = 'occasionally', 3 = 'frequently', 4 = 'often', and 5 = 'always'). According to the authors, the test assesses the extent of an individual's internet involvement and categorizes Problematic usage of the Internet (PUI) into mild, moderate, and severe impairment levels. The instrument used in this study (the IAT-10) was a reduced version of the Internet Addiction Test. The following items were used: 3, 5, 9, 10, 12, 13, 14, 15, 18, and 20. The total score is calculated by summing the responses and can range from 0 to 100 points, with higher scores indicating greater levels of PUI. The Bergen Social Media Addiction Scale (BSMAS): This instrument was adapted from the Bergen Facebook Addiction Scale [24] (Portuguese version of Pontes, Andreassen & Griffiths, [25]) by the authors of this study, by replacing the word "Facebook" with "social media". It consists of six items rated on a 5-point Likert scale (1 = 'very rarely', 2 = 'rarely', 3 = 'sometimes', 4 = 'often', and 5 = 'very often') about the user's experience in the past year. It was developed based on Griffiths' [26] six core features of addiction: salience, negative mood management, tolerance, withdrawal, conflict, and relapse. The instrument's total score (ranging from 6 to 30 points) is obtained by adding the total scores of the responses, with higher scores indicating higher levels of PUI. Currently, there are two studies in the literature that have proposed scores of 19 [27] and 24 [28] as cut-off points between no PUI and the existence of PUI. The Portuguese version presented good internal consistency (Cronbach's *alpha* of 0.83) [25], like in the original version [24]. The values presented in the composite reliability and factor determinacy (0.82 and 0.91, respectively) further supported the instrument's reliability [25]. The Internet Gaming Disorder Scale–Short-Form (IGDS9-SF) [29]: This self-report instrument is composed of 9 items rated on a 5-point Likert scale (1 = 'never', 2 = 'rarely', 3 = 'sometimes', 4 = 'often, 5 = 'always'). Developed by using the nine main criteria that define internet gaming disorder [9], this instrument assesses the severity of internet gaming disorder and its detrimental effects by examining gaming activities that occurred over 12 months [9,29]. The instrument's total score (ranging from 9 to 45 points) is obtained by adding the total scores of the responses, both online and offline, with higher scores representing higher levels of PUI. This scale was validated for the Portuguese population [30] with results indicating good internal consistency (Cronbach's *alpha* of 0.87), like in the original version [29].

2.3. Procedures

2.3.1. Data collection

The present study is a descriptive, observational, cross-sectional quantitative study based on a convenience sample [31,32]. Formal authorization was requested from the authors of the original instruments. The study was approved by the ethics committee of the Escola Superior de Saúde – Politécnico do Porto [Ethics number CE0060A] and the participants signed an informed consent form following the Declaration of Helsinki (2013). The confidentiality and anonymity of the data were ensured.

2.4. Data analysis

2.4.1. Statistical procedures

Analyses were conducted using the Statistical Package for the Social Sciences (SPSS) 28 [33], with the exception of Confirmatory Factor Analysis (CFA), which was performed using Jamovi (Version 2.5) [34]. All statistical tests were conducted at a significance level of $p < .05$.

2.4.2. Sample size calculation

Osborne and Costello suggested an item-response ratio ranging from 1: 5 to 1:10. To ensure more robust results, we opted for the more conservative method and considered a 1:10 ratio, which required a minimum sample size of 100 participants since the ISAAQ-10 contains 10 items [35].

2.4.3. Descriptive statistics

Descriptive statistics were calculated for continuous variables, including mean (M), standard deviation (SD), and range (minimum and maximum values). For categorical variables, absolute (n) and relative (%) frequencies were computed. Item response distributions, along with the main descriptive statistics (mean, standard deviation, range, and skewness) for the 10 items, were also examined.

2.4.4. Reliability measures

2.4.4.1. Internal consistency (Cronbach's alpha). The internal consistency of the instrument was assessed using Cronbach's *alpha*. A value greater than 0.70 is generally considered acceptable for demonstrating that the instrument's items are consistently measuring the same construct [36]. Specifically, a Cronbach's *alpha* between 0.70 and 0.90 suggests good internal consistency. Values above 0.90 may indicate redundancy between items (i.e., excessive similarity), while values below 0.70 suggest inadequate consistency [36,37].

2.4.4.2. Test-retest reliability (Intraclass Correlation Coefficient - ICC). The test-retest reliability of the instrument was assessed using the Intraclass Correlation Coefficient (ICC), which measures the consistency of scores across two different time points [38,39]. An ICC value of 0.80 or higher generally indicates good stability, while values between 0.60 and 0.80 suggest acceptable reliability. ICC values below 0.60 indicate poor reliability.

To calculate the ICC, a mean-rating (k = 2) approach was used, involving two assessments or evaluations at different time points. This method helps to evaluate the instrument's temporal consistency and ensures it produces stable results over time [40,41].

2.4.5. Validity measures

2.4.5.1. Construct validity (Confirmatory Factor Analysis - CFA). Construct validity, defined as how well the instrument captures a concept that is not directly measurable (i.e., the latent factor[s] of PUI), was assessed by performing a Confirmatory Factor Analysis (CFA) using diagonally weighted least squares (DWLS) estimation. DWLS is appropriate for models with ordinal data, such as Likert-scale items, and provides robust estimates of model parameters and fit indices. This method is commonly employed in structural equation modeling (SEM) to assess the validity of the factor structure [42].

CFA tests whether the data fit the hypothesized model, examining the factor structure of the instrument. Common fit indices used, as proposed by Hu and Bentler [43], include:

- Comparative Fit Index (CFI): Values above 0.90 indicate a good model fit.
- Tucker-Lewis Index (TLI): Values above 0.90 suggest a good fit.
- Root Mean Square Error of Approximation (RMSEA): Values below 0.08 indicate acceptable fit.

- Goodness of Fit Index (GFI):
- Standardized Root Mean Square Residual (SRMR): Values below 0.08 indicate a good model fit.

2.4.5.2. Convergent validity. Convergent validity assesses how well scores from one instrument correlate with scores from another valid instrument measuring the same or similar construct [44,45]. Pearson's correlation coefficient was calculated between the ISAAQ-10 and IAT total scores. A strong, statistically significant correlation (typically greater than 0.50) indicates good convergent validity.

2.4.5.3. Concurrent validity. Concurrent validity examines whether an instrument correlates with other established measures collected at the same time. In this study, concurrent validity was assessed by calculating Pearson's correlation coefficient between ISAAQ-10 individual activity scores and two established instruments, namely:

1. Online gaming: The IGDS9-SF was correlated with ISAAQ-10's gaming activity score (item 2: "Internet gaming including Massively-Multiplayer-Online-Role-Playing-Games").
2. Social networking: The BSMAS was correlated with ISAAQ-10's social networking activity score (item 6: "Social networking, including browsing social media and messaging").

The ISAAQ-10's individual activity scores were calculated using the following formula:

ISAAQ-10 Activity Score = $\log_{10}$ (ISAAQ-10 total score × Activity score). A strong, statistically significant correlation ($r \geq 0.50$) with the established measures was used to evaluate concurrent validity.

3. Results

The initial sample consisted of 636 participants. However, 46 of these were excluded due to ineligibility: 24 participants were not enrolled in any university program, 18 participants were in secondary schools, one participant was in elementary school, and the remaining three were excluded because they were studying at universities in another country.

The final sample size of 590 participants exceeded the recommended 100 respondents, ensuring sufficient statistical power.

The participants were students from various Portuguese universities and their contacts. Most were single (93.6 %), female (85.1 %), and undergraduate (67.3 %) students (Table 1). Participants reported spending a mean of 3.84 h on social media daily ($SD = 2.32$). The most frequently used social media platforms were Instagram (97.6 %), WhatsApp (97.1 %), and YouTube (85.8 %).

Table 2 displays the distribution of responses for the ISAAQ-10 items, which follows an approximately normal distribution, as indicated by skewness values near zero for most items. This suggests a balanced distribution of responses without significant tendencies towards the extremes.

The ISAAQ-10 items showed variation in terms of participant engagement with online activities. Item 1 ("How often do you check social media platforms such as Instagram or Facebook?") had the highest mean score ($M = 2.67$), indicating frequent social media use, with 31.9 % of participants selecting "frequently" and 20.5 % choosing "very often". Item 3 ("How often do you share content online or post updates?") showed moderate engagement ($M = 2.58$), with 28.1 % reporting "frequently" and 21.9 % "very often". Item 2 ("How often do you watch videos on platforms like YouTube?") had a mean of 2.16, reflecting moderate engagement, with 22.9 % of participants choosing "rarely" and 24.9 % choosing "occasionally". Items 4 and 5 ("How often do you read news online?" and "How often do you engage in online gaming?", respectively) both had a mean of 1.67, indicating lower engagement, with 32.2 % and 32.5 % of participants, respectively, selecting "rarely". Item 10 ("How often do you check your email or respond to messages online?") showed slightly higher engagement ($M = 1.63$), with 20.2 % of participants reporting "never" and 29.5 % reporting "rarely". Item 6 ("How often do you use the internet for academic purposes?") had a slightly lower mean ($M = 1.49$), with 27.3 % of participants responding "never". Item 8 ("How often do you participate in online purchases?") showed low engagement ($M = 1.30$), with 33.9 % of participants reporting "never". Item 7 ("How often do you use online forums or discussion groups?") had a very low mean ($M = 1.02$), with 41.2 % of participants selecting "never". Item 9 ("How often do you engage in niche internet activities, like specialized hobby websites or forums?") had the lowest mean ($M = 0.75$), with over a half of the participants (53.1 %) reporting "never".

Table 1
Sociodemographic characteristics of the participating sample and their social media use.

	n (%)	*Min*	*Max*	*M*	*SD*
Gender					
Female	502 (85.1 %)	-	-	-	-
Male	88 (14.9 %)				
Marital status					
Single	552 (93.6 %)	-	-	-	-
Married or Cohabitating	37 (6.3 %)				
Divorced	1 (0.2 %)				
Number of school years completed		12	23	14.27	1.79
Number of academic years failed		0	7	0.27	0.70
Educational level					
Undergraduate	397 (67.3 %)	-	-	-	-
Master student	151 (25.6 %)				
PhD student	14 (2.4 %)				
Other	28 (4.7 %)				
Daily time spent on social media (hours)		0.5	15.0	3.84	2.32
Social media platform					
Instagram	576 (97.6 %)				
Whatapp	573 (97.1 %)				
Youtube	506 (85.8 %)	-	-	-	-
Facebook	463 (78.5 %)				
Twitter	315 (53.4 %)				
TikTok	301 (51.0 %)				
Pinterest	289 (49.0 %)				
Linkedin	137 (23.2 %)				
Snapchat	98 (16.6 %)				
Reddit	58 (9.8 %)				

Note: Min = minimum; *Max* = maximum; *M* = mean; *SD* = standard deviation.

These results highlight the variation in problematic usage of the internet (PUI) across different online activities. Social media-related items, such as Item 1, reflect higher engagement, suggesting that platforms like Instagram, WhatsApp, and YouTube may be used in ways that could be perceived as problematic for some individuals. In contrast, less common online behaviours, such as those described in Item 9 (i.e., niche activities like online gaming or content consumption in specialized forums), exhibited substancial lower engagement, with the majority of participants reporting no involvement. This indicates that certain online behaviours, particularly those linked to social interactions, may pose a greater risk for problematic use than others.

3.1. Reliability: internal consistency and test-retest reliability

The internal consistency of the ISAAQ-10 was excellent, with a Cronbach's *alpha* of 0.93. The other instruments used in the study also

Table 2
Item response distributions and the main descriptive statistics (i.e., mean, standard deviation, range, and skewness) of the 10 items.

Item #	*M*	*SD*	Range	Skewness	"Not at all"	"Rarely"	"Occasionally"	"Frequently"	"Very often"	"All the time"
					n (%)					
1	2.67	1.10	0–5	−0.07	11 (1.9 %)	75 (12.7 %)	174 (29.5 %)	188 (31.9 %)	121 (20.5 %)	21 (3.6 %)
2	2.16	1.33	0–5	0.09	68 (11.5 %)	135 (22.9 %)	147 (24.9 %)	131 (22.2 %)	94 (15.9 %)	15 (2.5 %)
3	2.58	1.25	0–5	−0.21	35 (5.9 %)	82 (13.9 %)	155 (26.3 %)	166 (28.1 %)	129 (21.9 %)	23 (3.9 %)
4	1.67	1.21	0–5	0.45	102 (17.3 %)	190 (32.2 %)	152 (25.8 %)	97 (16.4 %)	43 (7.3 %)	6 (1 %)
5	1.67	1.59	0–5	0.48	92 (15.6 %)	192 (32.5 %)	176 (29.8 %)	85 (14.4 %)	39 (6.6 %)	6 (1 %)
6	1.49	1.35	0–5	0.75	161 (27.3 %)	185 (31.4 %)	115 (19.5 %)	65 (11 %)	50 (8.5 %)	14 (2.4 %)
7	1.02	1.14	0–5	1.11	243 (41.2 %)	194 (32.9 %)	79 (13.4 %)	47 (8.0 %)	25 (4.2 %)	2 (0.3 %)
8	1.30	1.29	0–5	0.84	200 (33.9 %)	175 (29.7 %)	104 (17.6 %)	67 (11.4 %)	35 (5.9 %)	9 (1.5 %)
9	0.75	1.04	0–5	1.65	313 (53.1 %)	179 (30.3 %)	51 (8.6 %)	29 (4.9 %)	14 (2.4 %)	4 (0.7 %)
10	1.63	1.25	0–5	0.55	119 (20.2 %)	174 (29.5 %)	166 (28.1 %)	78 (13.2 %)	42 (7.1 %)	11 (1.9 %)

Note: M = mean; SD = standard deviation.

showed strong reliability values: $\alpha = 0.84$ for the IAT-10, $\alpha = 0.91$ for the BSMAS, and $\alpha = 0.94$ for the IGDS9-SF. Regarding test-retest reliability, the ISAAQ-10 exhibited a high intraclass correlation coefficient (ICC = 0.865, 95 % CI [0.669, 0.939]).

3.2. Validity measures

3.2.1. Construct validity

To determine whether Ioannidis et al.'s [20] and Omrawo et al.'s [19] one-factor structure could be replicated in the Portuguese sample [42,43], a CFA was computed using a diagonally weighted least squares (DWLS) estimation.

The unidimensional structure of the ISAAQ-10 was confirmed ($N = 590$; $\chi^2 = 310.78$, df = 35, $p < .001$). Model fit indices were assessed to evaluate the adequacy of the CFA model. The TLI = 0.966 and GFI = 0.973 exceeded the recommended thresholds of 0.90 for good fit [43], suggesting a satisfactory model fit. Although CFI = 0.850 and RMSEA = 0.116 [0.104–0.128] did not meet the ideal thresholds (CFI > 0.90 and RMSEA <0.08), the model was still considered acceptable based on the strong TLI and GFI values, in line with the guidelines of Hu and Bentler [43]. Additionally, SRMR = 0.078 was below the 0.08 threshold, indicating a good fit.

The model explained 48.3 % of the variance, providing support for the construct validity of the instrument. The factor loadings are presented in Table 3.

3.2.2. Convergent validity

Convergent validity was assessed by calculating the Pearson's correlation coefficient between the ISAAQ-10 and IAT-10 total scores. The correlation was $r = 0.574$ ($p < .001$), indicating a moderate to strong statistically significant association between the two instruments. This finding supports the convergent validity of the ISAAQ-10, demonstrating that it correlates significantly with another established measure of the same construct, i.e., the IAT-10.

Table 3
Factor loadings.

Factor	ISAAQ-10 Item	Estimate	SE	*Z*	*p*
1	1	1.000	0.000		
	2	1.153	0.057	20.140	< 0.001
	3	1.125	0.057	19.780	< 0.001
	4	1.198	0.054	22.047	< 0.001
	5	1.098	0.059	18.672	< 0.001
	6	1.267	0.061	20.852	< 0.001
	7	1.103	0.060	18.248	< 0.001
	8	1.138	0.060	18.962	< 0.001
	9	1.193	0.066	18.215	< 0.001
	10	1.030	0.055	18.575	< 0.001

Note: SE = standard error.

3.2.3. Concurrent validity

The calculation of the ISAAQ-10 individual activity scores revealed significant and positive correlations with the established measures for both online gaming and social networking. Specifically:

1. Online Gaming: The ISAAQ-10 gaming activity score (item 2: "Internet gaming including Massively-Multiplayer-Online-Role-Playing-Games [MMORPGs]") showed a strong correlation with the IGDS9-SF, $r = 0.873$ ($p < .001$).
2. Social Networking: The ISAAQ-10 social networking activity score (item 6: "Social networking, including browsing social media and messaging over online platforms") demonstrated a significant correlation with the BSMAS, $r = 0.670$ ($p < .001$).

These results support the concurrent validity of the ISAAQ-10, demonstrating that it correlates strongly and significantly with the established measures for PUI in both gaming and social networking contexts.

3.2.4. Nature of specific potentially problematic internet activities

The ISAAQ Part B items gauge the duration of involvement in various internet activities such as general surfing, gaming, time-wasting activities, online shopping, gambling, social network site use, cyberchondria, gambling, pornography, streaming, and cyberbullying. For exploratory purposes, an ad-hoc ISAAQ-10 severity cut-off score of ≥31 (i.e., 31–50) was applied to the Portuguese sample, categorizing participants into a 'high-PUI' group ($n = 48$) and a 'low-PUI' group ($n = 542$).

Fig. 1 illustrates that the high-PUI group spent more time on all ten online activities compared to the low-PUI group. Among these, SNS use ($p < .001$), followed by streaming ($p < .01$), general surfing ($p < .01$), cyberchondria ($p < .05$), and shopping ($p < .05$) were the most frequently engaged activities in both groups. However, the high-PUI group reported significantly higher involvement in these activities compared to the low-PUI group. Significant differences were also observed in pornography viewing ($p < .01$), although this was the third least performed activity overall, ranking only above cyberbullying and gambling.

Fig. 2 further explores SNS use by showing the weighted number of respondents across different usage levels. The high-PUI group demonstrates a clear upward trend, indicating a greater concentration of individuals in higher SNS usage categories. This pattern reinforces the idea that excessive SNS use is a key characteristic of the PUI (see Figs. 1 and 2 for a histogram and exploratory plot illustrations).

4. Discussion

The goals of this study were to translate the ISAAQ-10 into Portuguese, to examine the psychometric characteristics of this translated version, and to provide the first validation of the ISAAQ-10 social networking use activity score for identifying problematic social media

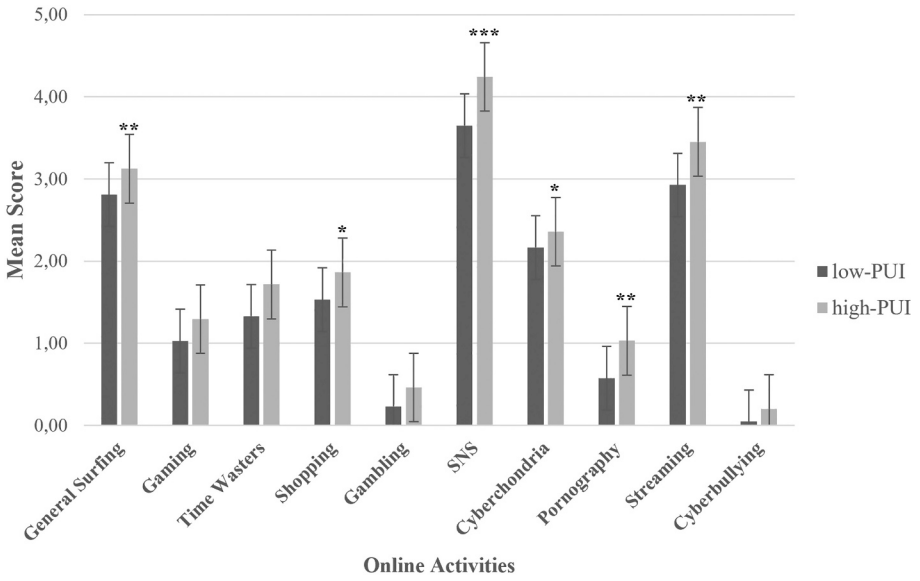

Fig. 1. ISAAQ Part B scores for time spent on different online activities.
Note: Mean scores of Internet Severity and Activities Questionnaire (6-point Likert scale from 0 to 5), Part B; "high-PUI" defined as having total ISAAQ Part A score ≥ 31 ($n = 48$). SNS = Social Network Sites use. PUI = Problematic usage of the internet. Error bars are standard errors. Significance: * = $p < .05$; ** = $p < .01$; *** = $p < .001$, student *t*-test.

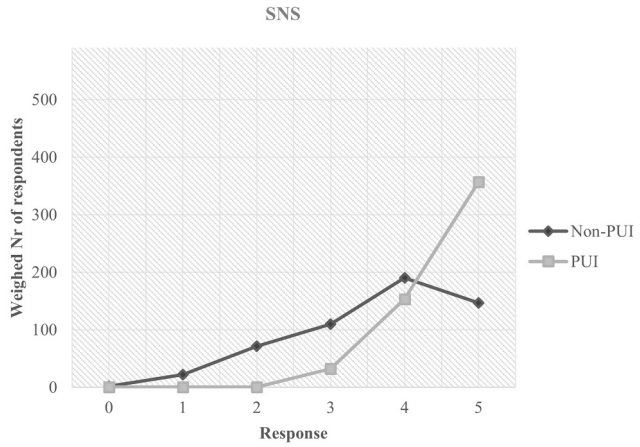

Fig. 2. Exploratory plot - Likert scores (count) for SNS of Internet Severity and Activities Questionnaire Part B.
Note: "High-PUI" was defined as having a total ISAAQ-10 Part A score ≥ 31. PUI = Problematic usage of the Internet. $N = 590$. "High-PUI" $n = 48$, "low-PUI" $n = 542$. SNS = Social Network Sites use. PUI participants were over-sampled to illustrate differences in responses between groups.

use. Data from a sample of 590 university students were collected for this purpose.

The ISAAQ-10 enables the assessment of overall PUI severity (Part A), as well as the frequency of individual activities undertaken online (Part B). The translated version of the ISAAQ (Part A) presented a good internal consistency, in line with values reported in previous literature [19,20].

The results confirmed a one-factor solution of the ISAAQ-10. The one-factor structure of ISAAQ's Part A was also found in a large dataset from South Africa, and in datasets from the United Kingdom and the United States [19]. This aligns with previous research, which also recommended that a one-factor IAT model adequately fits culture-specific groups and encompasses a broad spectrum of PUI characteristics [24]. The identified symptoms are also consistent with prior literature, indicating that the ISAAQ-10 offers a comprehensive measurement of PUI, encompassing diverse symptom categories in line with the prevailing psychological model of PUI (I-PACE) [20], rather than solely focusing on addiction symptomatology [46].

Cultural differences can influence how respondents interpret items, leading to variations in factor structures. One additional benefit from this work, is that the consistent factor structure remains consistent (i.e., factorial invariance or measurement invariance), in the Portuguese student sample, ensures that the scale measures the same constructs in the same way, thus allowing for meaningful cross-cultural comparisons.

The results also demonstrated convergent validity, indicating that ISAAQ-10's Part A is aligned with the well-established IAT-10 in measuring the severity of PUI, thereby enhancing the scale's external validity.

ISAAQ-10's gaming activity score also correlated positively and significantly with an established measure of internet gaming, as had happened in previous work [20], but also expanded on that work by showing a significant and positive correlation of ISAAQ-10's SNS use activity score with established measures of problematic social media use, which is a novel finding.

Regarding ISAAQ-10's Part B and the nature of specific potentially problematic internet activities, the Portuguese data showed patterns consistent with those found in South Africa, the United Kingdom, and the United States of America [19,26]. This consistency was found both in terms of the most frequent and least frequent activities, and regarding the previously defined "high-PUI" group being the one spending more time on these activities compared with the previously defined "low-PUI" group [19,26].

The online activities with the highest levels of engagement in both "high-PUI" and "low-PUI" groups were social networking, followed by streaming and general surfing. These online activities are in line with the literature and might be explained by the sample's gender characteristics (women composing 85.1 % of the sample). As mentioned earlier, the available literature suggests that women spend – on average – more time than do men on social networks [47,48]. Additionally, prior work suggests that women also spend more time reading and searching for medical information, such as symptomatology, diagnoses and treatments, and associated risks [49,50]. In referring to streaming habits, the literature has shown that there are no gender differences in its use. However, streaming content is distinct, with women preferring to

watch, for example, series and makeup tutorials while men prefer to watch games and movies [51,52]. In turn, the results showed that online shopping, skill games & time wasters and internet gaming including Massively-Multiplayer-Online-Role-Playing-Games had an intermediate percentage and pornography, gambling and cyberbullying had the lowest percentages. One might assume that online shopping would present a high percentage of participants with "high-PUI" levels, given that it is an activity mostly performed by women [53,54]. However, the observed moderate percentage can be explained by the monetary dependence factor, explained previously [55]. In the same line of thought, the small percentages of "high-PUI" participants found regarding gambling may be explained by the small percentage of men in the sample, since they are the ones who constitute the majority of gamblers [56].

Finally, the low percentage of cyberbullying can be explained by the relatively high educational level of the participants. Indeed, several studies have shown that cyberbullying has a decreasing trend from elementary school to university education [57,58].

This work is not without limitations. The study involved a convenience sample (recruited via social media and snowballing methods), and university students, and the findings may not generalize to other populations, or to the general population. Another limitation is the potential impact of gender bias on the results, particularly in the analysis of the psychometric properties of the ISAAQ-10, given that the sample is predominantly composed of women. However, when exploring the validity of the ISAAQ-10's social networking use activity score for identifying problematic social media use, it should be noted that this behaviour is more commonly reported among women.

The test-retest reliability method used in this study also has limitations. Specifically, the time interval between test administrations can introduce learning effects, which could artificially inflate reliability estimates. Additionally, external variables, such as life events occurring between the two testing sessions, may influence participants' responses and introduce variability unrelated to the instrument itself. Another consideration is the potential impact on participant engagement because completing the same instrument for a second time may affect motivation. To mitigate these limitations, we administered the second test only to participants who voluntarily agreed to participate in the retest phase, thereby ensuring a committed sample while aiming to minimize potential biases.

Since this was the first study using the Portuguese version of ISAAQ-10, future work should explore the properties of this version of the scale in other Portuguese samples across various settings. Additionally, as this study lack a clinical ascertainment of the sample's levels of PUI, we cannot determine whether those classified as the "high-PUI" group experience functional impairment due to their online usage or seek help for mental health. Future research could explore the impact of 'high-PUI' groups on mental health outcomes.

5. Conclusion

This work provided empirical evidence for the validity and reliability of the Portuguese translation of the ISAAQ-10, an instrument that assesses the severity of PUI alongside the various online activities. It also provided the first validation of the social network site use activity score of the ISAAQ-10, which correlated highly with established measures of problematic social media use. Future studies are needed in a range of other populations and settings to expand on the knowledge basis of the instrument.

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Ethics approval

The study was approved by the Ethics Committee of the ESS-P. PORTO (CE0100C) and followed the European Code of Conduct for Research Integrity and the General Data Protection Regulation recently approved for EU countries (Regulation 2016/679).

Consent to participate

Informed consent was obtained from all participants that were included in the study.

Disclosure section

SRC receives honoraria from Elsevier for journal editorial work. KI receives honoraria from Elsevier for journal editorial work.

CRediT authorship contribution statement

Artemisa R. Dores: Writing – original draft, Validation, Supervision, Resources, Project administration, Methodology, Investigation, Funding acquisition, Data curation, Conceptualization. **Cátia Antunes:** Formal analysis, Data curation. **Andreia Geraldo:** Writing – review & editing, Visualization, Methodology, Formal analysis. **Irene P. Carvalho:** Writing – review & editing, Investigation. **António Marques:** Writing – review & editing, Resources, Methodology, Investigation, Funding acquisition. **Ilídio Pereira:** Software, Formal analysis. **Samuel R. Chamberlain:** Writing – review & editing. **Christine Lochner:** Writing – review & editing, Methodology. **Konstantinos Ioannidis:** Writing – review & editing, Visualization, Validation, Supervision, Methodology, Conceptualization.

Appendix A. Translation and back-translation of the ISAAQ-10

	Original	Portuguese Translation	Back-translation
	Score	Pontuação	Score
0	Does not happen to me at all	Nunca me acontece	It never happens to me
1	Rarely happens to me	Raramente me acontece	It rarely happens to me
2	Occasionally happens to me	Acontece-me ocasionalmente	It sometimes happens to me
3	Frequently happens to me	Acontece-me frequentemente	It often happens to me
4	Very often happens to me	Acontece-me muito frequentemente	It very often happens to me
5	Happens to me all the time	Acontece-me sempre	It always happens to me

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	Original	Portuguese Translation	Back-translation
	Score	Pontuação	Score
1	**Original**: How often do you find yourself losing track of time while engaging in an internet related activity? **Portuguese**: Com que frequência dá por si a perder a noção do tempo enquanto está a realizar alguma atividade da internet? **Back-translation**: How often do you find yourself losing track of time when you are doing an internet activity?		
2	**Original**: How often do you use internet related activities to block out disturbing thoughts about your life and to soothe yourself? **Portuguese**: Com que frequência utiliza atividades na internet para bloquear pensamentos perturbadores acerca da sua vida e para se acalmar? **Back-translation**: How often do you use internet activities to block out disturbing thoughts about your life and to calm yourself down?		
3	**Original**: How often do you choose to spend time on internet related activities to battle loneliness or boredom? **Portuguese**: Com que frequência escolhe passar tempo em atividades na internet para combater a solidão ou o aborrecimento? **Back-translation**: How often do you choose to spend time on internet activities to fight loneliness or boredom?		
4	**Original**: How often do you neglect your normal day-to-day activities to spend more time on an internet related activity? **Portuguese**: Com que frequência negligencia as suas atividades diárias habituais para passar mais tempo numa atividade na internet? **Back-translation**: How often do you neglect your usual daily activities to spend more time on an internet activity?		
5	**Original**: How often do your school/study/work suffer because of the amount of time you spend on internet related activities? **Portuguese**: Com que frequência as atividades escolares/estudo/trabalho são prejudicadas por causa da quantidade de tempo que passa em atividades na internet? **Back-translation**: How often are school/study/work activities undermined because of the amount of time you spend on internet activities?		
6	**Original**: How often do you find yourself trying to stop an excessive or repetitive online activity but feeling an urge to continue? **Portuguese**: Com que frequência dá por si a tentar parar uma atividade online excessiva ou repetitiva, mas sente um impulso para continuar a fazê-la? **Back-translation**: How often do you try to interrupt an excessive or repetitive online activity, but feel a compulsion to continue doing it?		
7	**Original**: How often do you feel preoccupied with the Internet when offline, or fantasize or get repetitive urges to get online? **Portuguese**: Com que frequência se sente preocupado com a internet quando está offline, ou fantasia ou sente impulsos repetidos para se ir pôr/estar online? **Back-translation**: How often do you feel preoccupied about the internet when you are offline, or fantasize or feel repeated urges to go online?		
8	**Original**: How often do you lose sleep due to late-night internet related activities? **Portuguese**: Com que frequência perde o sono devido a atividades na internet até tarde, à noite? **Back-translation**: How often do you lose sleep due to internet activities late at night?		
9	**Original**: How often do you find yourself experiencing physical or psychological problems as a consequence of prolonged internet related activities? **Portuguese**: Com que frequência dá por si a ter problemas físicos ou psicológicos como consequência de atividades prolongadas na internet? **Back-translation**: How often do you experience physical or psychological problems as a consequence of prolonged internet activities?		
10	**Original**: How often do you try to cut down the amount of time you spend on-line and fail? **Portuguese**: Com que frequência tenta diminuir a quantidade de tempo que passa online e não consegue? **Back-translation**: How often do you try to reduce the amount of time you spend online and are unable to?		
	Original: Over the last 6 months, I have spent time on non-work or study related online activities as such: **Portuguese:** Nos últimos 6 meses, passei tempo em atividades on-line não relacionadas com trabalho ou o estudo, como: **Back-translation:** Over the last 6 months, I have spent time on online activities not related to work or study, such as:		
1	**Original:** General Surfing (includes any unstructured online activities) **Portuguese:** Navegação geral (inclui qualquer atividade online não estruturada) **Back-translation:** General browsing (includes any non-structured online activity)		
2	**Original:** Internet gaming including Massively-Multiplayer-Online-Role-Playing-Games (includes online gaming and gaming with multiple other players and role-playing format) **Portuguese:** Jogos na Internet (incluindo jogos online e jogos com múltiplos jogadores e em formato de interpretação de papéis) **Back-translation:** Internet gaming (includes online games and multiplayer, role-playing games)		
3	**Original:** Skill games & Time wasters (includes games & applications on computer, tablet, mobile phone or similar for which activity is without specific benefit) **Portuguese:** Jogos de perícia e de gasto de tempo (inclui jogos e aplicações no computador, tablet, telemóvel ou similar, para os quais a atividade não tem benefício específico) **Back-translation:** Skill and time-wasting games (includes games and apps on the computer, tablet, mobile phone or similar devices, in which the activity has no specific benefits).		
4	**Original:** Online Shopping (includes activity on online shopping platforms and auction websites) **Portuguese:** Compras online (inclui atividades em plataformas de compras online e em páginas de leilão) **Back-translation:** Online shopping (includes activities on online shopping platforms and auction websites)		
5	**Original:** Online gambling (includes any online activity in which there is a chance for monetary gain or other stakes) **Portuguese:** Jogos com apostas online (inclui qualquer atividade online em que existe a possibilidade de um ganho monetário ou outras apostas) **Back-translation:** Online betting games (includes any online activities in which there is a possibility of a monetary gain or other opportunities/bets)		
6	**Original:** Social networking (includes browsing social media and messaging/communicating over online social platforms) **Portuguese:** Redes sociais (inclui navegar nas redes sociais e enviar mensagens/comunicar através de plataformas sociais online) **Back-translation:** Social Media (includes browsing social media and sending messages/communicating through online social platforms)		
7	**Original:** Health & medicine (includes any online activity relating to reading & researching medical facts, diagnoses, treatments and risks) **Portuguese:** Saúde e medicina (inclui qualquer atividade online relacionada com a leitura e pesquisa de factos médicos, diagnósticos, tratamentos e riscos) **Back-translation:** Health and Medicine (includes any online activity related to reading and searching medical facts, diagnoses, treatments and risks)		
8	**Original:** Pornography (includes cybersex, cyber-texting, viewing pornography and other online sexual activities) **Portuguese:** Pornografia (inclui sexo virtual, mensagens de texto virtuais, ver pornografia e outras atividades sexuais online) **Back-translation:** Pornography (includes virtual sex, virtual text messages, watching pornography and other online sexual activities)		
9	**Original:** Streaming media (include music or video streaming activities on any platform) **Portuguese:** Meios de difusão (incluem atividades de difusão de música ou vídeo em qualquer plataforma) **Back-translation:** Streaming platforms (includes activities related to streaming music or video on any platform)		

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10	**Original:** Cyberbullying (includes exchange of insults, nasty texts/emails, unpleasant media, pranks) **Portuguese:** Ciberbullying (inclui troca de insultos, mensagens/emails mal intencionados, partilha de conteúdo desagradável, ou partidas) **Back-translation:** Cyberbullying (includes the exchange of insults, unpleasant messages or emails, sharing unpleasant content, or pranks)

Data availability

The data that support the findings of this study are available from the corresponding author, upon reasonable request.

References

[1] Dores AR, Geraldo A, Carvalho IP, Barbosa F. The use of new digital information and communication technologies in psychological counseling during the COVID-19 pandemic. IJERPH 2020;17:7663. https://doi.org/10.3390/ijerph17207663.

[2] Geraldo A, Dores AR, Carvalho IP, Guerreiro S, Castro-Caldas A, Barbosa F. At-distance neurocognitive rehabilitation during COVID-19 pandemic: a first glance of patients' perspectives about the process and an online platform. Appl Neuropsychol Adult 2022:1–10. https://doi.org/10.1080/23279095.2022.2100993.

[3] Fineberg N, Demetrovics Z, Stein D, Ioannidis K, Potenza M, Grünblatt E, et al. Manifesto for a European research network into problematic usage of the internet. Eur Neuropsychopharmacol 2018;28:1232–46. https://doi.org/10.1016/j.euroneuro.2018.08.004.

[4] Fineberg NA, Menchón JM, Hall N, Dell'Osso B, Brand M, Potenza MN, et al. Advances in problematic usage of the internet research – a narrative review by experts from the European network for problematic usage of the internet. Compr Psychiatry 2022;118:152346. https://doi.org/10.1016/j.comppsych.2022.152346.

[5] Floros GD, Ioannidis K. Editorial: the impact of online addiction on general health, well-being and associated societal costs. Front Public Health 2021. https://doi.org/10.3389/fpubh.2021.676498.

[6] Ioannidis K, Fineberg N, Chamberlain SR. Taming the chimaera-hydra: disconnecting from the net to fortify our mental health. Br J Psychiatry 2024:1–3. https://doi.org/10.1192/bjp.2024.159.

[7] Ioannidis K, Treder MS, Chamberlain SR, Kiraly F, Redden SA, Stein DJ, et al. Problematic internet use as an age-related multifaceted problem: evidence from a two-site survey. Addict Behav 2018;81:157–66. https://doi.org/10.1016/j.addbeh.2018.02.017.

[8] World Health Organization. International classification of diseases. 11th ed. 2023.

[9] American Psychiatric Association. Diagnostic and statistical manual of mental disorders. 5th ed. Washington (DC): American Psychiatric Association; 2022.

[10] Brand M, Rumpf H-J, Demetrovics Z, Müller A, Stark R, King DL, et al. Which conditions should be considered as disorders in the international classification of diseases (ICD-11) designation of "other specified disorders due to addictive behaviors"? J Behav Addict 2020. https://doi.org/10.1556/2006.2020.00035.

[11] Oberst U, Wegmann E, Stodt B, Brand M, Chamarro A. Negative consequences from heavy social networking in adolescents: the mediating role of fear of missing out. J Adolesc 2017;55:51–60. https://doi.org/10.1016/j.adolescence.2016.12.008.

[12] Statista. Most used social media platforms in Portugal in 3rd quarter 2023. 2023.

[13] Brand M, Wegmann E, Stark R, Müller A, Wölfling K, Robbins TW, et al. The interaction of person-affect-cognition-execution (I-PACE) model for addictive behaviors: update, generalization to addictive behaviors beyond internet-use disorders, and specification of the process character of addictive behaviors. Neurosci Biobehav Rev 2019;104:1–10. https://doi.org/10.1016/j.neubiorev.2019.06.032.

[14] Wegmann E, Brand M. Affective and cognitive processes involved in behavioral addictions. Addict Behav 2021;118:106885. https://doi.org/10.1016/j.addbeh.2021.106885.

[15] Oelker A, Rumpf HJ, Brand M, Müller SM. Validation of the ACSID-11 for consistent screening of specific internet-use disorders based on ICD-11 criteria for gaming disorder: a multitrait-multimethod approach. Compr Psychiatry 2024;132:152470. https://doi.org/10.1016/j.comppsych.2024.152470.

[16] Müller SM, Wegmann E, Oelker A, Stark R, Müller A, Montag C, et al. Assessment of criteria for specific internet-use disorders (ACSID-11): introduction of a new screening instrument capturing ICD-11 criteria for gaming disorder and other potential internet-use disorders. J Behav Addict 2022;11(2):427–50. https://doi.org/10.1556/2006.2022.00013.

[17] Young KS. Internet addiction: the emergence of a new clinical disorder. CyberPsychol Behav 1998;1:237–44. https://doi.org/10.1089/cpb.1998.1.237.

[18] Tiego J, Lochner C, Ioannidis K, Brand M, Stein DJ, Yücel M, et al. Measurement of the problematic usage of the internet unidimensional quasitrait continuum with item response theory. Psychol Assess 2021;33:652–71. https://doi.org/10.1037/pas0000870.

[19] Omrawo C, Ioannidis K, Grant JE, Lutz N, Chamberlain SR, Stein DJ, et al. A cross-national validation of the internet severity and activities addiction questionnaire (ISAAQ). Compr Psychiatry 2023;122:152378. https://doi.org/10.1016/j.comppsych.2023.152378.

[20] Ioannidis K, Tiego J, Lutz N, Omrawo C, Yücel M, Grant JE, et al. Internet severity and activities addiction questionnaire (ISAAQ): psychometrics of item response theory and clustering of online activities. Compr Psychiatry 2023;122:152366. https://doi.org/10.1016/j.comppsych.2023.152366.

[21] Pontes HM, Patrão IM, Griffiths MD. Portuguese validation of the internet addiction test: an empirical study. J Behav Addict 2014;3:107–14. https://doi.org/10.1556/JBA.3.2014.2.4.

[22] American Psychological Association. Publication manual of the American Psychological Association. 7th ed. Washington (DC): American Psychological Association; 2020. https://doi.org/10.1037/0000165-000.

[23] AERA, APA, NCME. Standards for educational and psychological testing: National council on measurement in education. American Educational Research Association; 2014.

[24] Andreassen CS, Torsheim T, Brunborg GS, Pallesen S. Development of a Facebook addiction scale. Psychol Rep 2012;110:501–17. https://doi.org/10.2466/02.09.18.PR0.110.2.501-517.

[25] Pontes HM, Andreassen CS, Griffiths MD. Portuguese validation of the Bergen Facebook addiction scale: an empirical study. Int J Ment Heal Addict 2016;14:1062–73. https://doi.org/10.1007/s11469-016-9694-y.

[26] Griffiths M. A 'components' model of addiction within a biopsychosocial framework. J Subst Use 2005;10:191–7. https://doi.org/10.1080/14659890500114359.

[27] Bányai F, Zsila Á, Király O, Maraz A, Elekes Z, Griffiths MD, et al. Problematic social media use: results from a large-scale nationally representative adolescent sample. PLoS One 2017;12:e0169839. https://doi.org/10.1371/journal.pone.0169839.

[28] Luo T, Qin L, Cheng L, Wang S, Zhu Z, Xu J, et al. Determination the cut-off point for the Bergen social media addiction (BSMAS): diagnostic contribution of the six criteria of the components model of addiction for social media disorder. JBA 2021;10:281–90. https://doi.org/10.1556/2006.2021.00025.

[29] Pontes HM, Griffiths MD. Measuring DSM-5 internet gaming disorder: development and validation of a short psychometric scale. Comput Hum Behav 2015;45:137–43. https://doi.org/10.1016/j.chb.2014.12.006.

[30] Pontes HM, Griffiths MD. Portuguese validation of the internet gaming disorder scale–short-form. Cyberpsychol Behav Soc Netw 2016;19:288–93. https://doi.org/10.1089/cyber.2015.0605.

[31] Creswell JW, Creswell JD. Research design: Qualitative, quantitative, and mixed methods approaches. SAGE; 2018.

[32] Jackson MR. Resistance to qual/quant parity: why the "paradigm" discussion can't be avoided. Qual Psychol 2015;2:181–98. https://doi.org/10.1037/qup0000031.

[33] IBM Corporation. IBM SPSS statistics for windows 2021.Version 28.0 [software]. 2021.

[34] The jamovi project. jamovi 2024.Version 2.5 [software]. 2024.

[35] Osborne JW, Costello AB. Sample size and subject to item ratio in principal components analysis. Pract Assess Res Eval 2004;9:11. https://doi.org/10.7275/ktzq-jq66.

[36] Streiner DL. Starting at the beginning: an introduction to coefficient alpha and internal consistency. J Pers Assess 2003;80:99–103. https://doi.org/10.1207/S15327752JPA8001_18.

[37] Tang W, Cui Y, Babenko O. Internal consistency: do we really know what it is and how to assess it? J Psychol Behav Sci 2014;2:205–20.

[38] Kimberlin CL, Winterstein AG. Validity and reliability of measurement instruments used in research. Am J Health Syst Pharm 2008;65:2276–84. https://doi.org/10.2146/ajhp070364.

[39] Vilagut G. Test-retest reliability. In: Michalos AC, editor. Encyclopedia of quality of life and well-being research. Dordrecht: Springer Netherlands; 2014. p. 6622–5. https://doi.org/10.1007/978-94-007-0753-5_3001.

[40] Koo TK, Li MY. A guideline of selecting and reporting intraclass correlation coefficients for reliability research. J Chiropr Med 2016;15:155–63. https://doi.org/10.1016/j.jcm.2016.02.012.

[41] Vanbelle S, Albert A. A note on the linearly weighted kappa coefficient for ordinal scales. Stat Methodol 2009;6:157–63. https://doi.org/10.1016/j.stamet.2008.06.001.

[42] Gallucci M, Jentschke S. SEMLj: jamovi SEM Analysis. 2021.

[43] Hu L, Bentler PM. Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives. Struct Equ Model Multidiscip J 1999;6(1):1–55. https://doi.org/10.1080/10705519909540118.

[44] De Vet HCW, Terwee CB, Mokkink LB, Knol DL. Measurement in medicine: A practical guide. 1st ed. Cambridge University Press; 2011. https://doi.org/10.1017/CBO9780511996214.

[45] Streiner DL, Norman GR, Cairney J. Health measurement scalesvol. 1. Oxford University Press; 2015. https://doi.org/10.1093/med/9780199685219.001.0001.

[46] Hook RW, Grant JE, Ioannidis K, Tiego J, Yücel M, Wilkinson P, et al. Trans-diagnostic measurement of impulsivity and compulsivity: a review of self-report tools. Neurosci Biobehav Rev 2021;120:455–69. https://doi.org/10.1016/j.neubiorev.2020.10.007.

[47] Burén J, Nutley SB, Sandberg D, Ström Wiman J, Thorell LB. Gaming and social media addiction in university students: sex differences, suitability of symptoms,

and association with psychosocial difficulties. Front Psychol 2021;12:740867. https://doi.org/10.3389/fpsyt.2021.740867.
[48] Kuss D, Griffiths M, Karila L, Billieux J. Internet addiction: a systematic review of epidemiological research for the last decade. CPD 2014;20:4026–52. https://doi.org/10.2174/1381612811319990617.
[49] Ivanova E. Internet addiction and cyberchondria - their relationship with well-being. JECS 2020;4:57–70. https://doi.org/10.15503/jecs20131.57.70.
[50] Khazaal Y, Chatton A, Rochat L, Hede V, Viswasam K, Penzenstadler L, et al. Compulsive health-related internet use and cyberchondria. Eur Addict Res 2021; 27:58–66. https://doi.org/10.1159/000510922.
[51] Austerberry D. The technology of video and audio streaming. 2nd ed. Focal Press; 2004.
[52] Long Q, Tefertiller AC. China's new mania for live streaming: gender differences in motives and uses of social live streaming services. Int J Hum Comput Interact 2020; 36:1314–24. https://doi.org/10.1080/10447318.2020.1746060.
[53] Claes L, Müller A, Luyckx K. Compulsive buying and hoarding as identity substitutes: the role of materialistic value endorsement and depression. Compr Psychiatry 2016;68:65–71. https://doi.org/10.1016/j.comppsych.2016.04.005.
[54] Trotzke P, Starcke K, Müller A, Brand M. Pathological buying online as a specific form of internet addiction: a model-based experimental investigation. PLoS One 2015;10:e0140296. https://doi.org/10.1371/journal.pone.0140296.
[55] Hauschildt K, Vögtle E, Gwosć C. Eurostudent VI overview and selected findings: Social and economic conditions of student life in Europe. 2018. https://doi.org/10.3278/104-274w.
[56] Calado F, Griffiths MD. Problem gambling worldwide: an update and systematic review of empirical research (2000–2015). J Behav Addict 2016;5:592–613. https://doi.org/10.1556/2006.5.2016.073.
[57] Kowalski RM, Limber SP. Electronic bullying among middle school students. J Adolesc Health 2007;41:S22–30. https://doi.org/10.1016/j.jadohealth.2007.08.017.
[58] Zalaquett CP, Chatters SJ. Cyberbullying in college: frequency, characteristics, and practical implications. SAGE Open 2014. https://doi.org/10.1177/2158244014526721.