



A Study of the Psychometric Properties of the Persian Version of the Online Gambling Symptom Assessment Scale in the Iranian Population

Mohammadreza Davoudi¹, Tayebeh Azarmehr², Fatemeh Abdoli¹, AmirHossein Sadeghi³, Sarah Salehi Inanloo¹, Fereshte Momeni¹, Zahra Khalili¹, Sahar Aliyaki¹

¹Department of Clinical Psychology, University of Social Welfare and Rehabilitation Sciences, Tehran, Iran

²Operating Room Instructor, Faculty of Paramedicine, Zabol University of Medical Sciences, Zabol, Iran

³Department of Clinical Psychology, Iran University Medical Sciences, Tehran, Iran

*Corresponding Author: Sahar Aliyaki, Email: h.aliyaki67@gmail.com

Abstract

Background: The primary objective of the current paper was to assess the psychometric attributes of the Persian version of the Online Gambling Symptom Assessment Scale (P-OGSAS) within the Iranian population.

Methods: The current study was conducted through a convenient sampling method between September and November 2021, involving 187 participants who had experienced online gambling at least once a month for the last 3 months. OGSAS was translated from English into Persian using the forward-backward translation method. Cronbach's alpha coefficient and principal component analysis (PCA) were employed to evaluate the reliability and validity of the scale, respectively. Participants were administered a battery of assessments, including P-OGSAS, Persian Gambling Disorder Screening Questionnaire (GDSQ-P), Patient Health Questionnaire-9 Items (PHQ-9), and Generalized Anxiety Disorder Questionnaire (GADQ-7), to assess validity and reliability.

Findings: The results showed that the 3-factor model of this scale provides the highest level of predictability. The 3-factor model accounts for 54.8% of the square load. With a Cronbach's alpha coefficient of 0.807, P-OGSAS demonstrated satisfactory reliability. Finally, OGSAS has a significant correlation with other scales, and as a result, this scale has suitable convergent validity.

Conclusion: P-OGSAS can adequately assess the symptoms and severity of online gambling. Therefore, clinicians could use this scale to evaluate the problems related to online gambling in the Iranian population.

Keywords: Gambling, Internet addiction, Psychometric properties, Addiction

Citation: Davoudi M, Azarmehr T, Abdoli F, Sadeghi A, Salehi Inanloo S, Momeni F, et al. A study of the psychometric properties of the Persian version of the online gambling symptom assessment scale in the Iranian population. *Addict Health*. 2024;16(2):76–82. doi:10.34172/ahj.2024.1458

Received: April 12, 2023, **Accepted:** April 15, 2024, **ePublished:** May 1, 2024

Introduction

Gambling and chance-based games have been popular entertainments and activities in most different cultures throughout the history of humanity.¹ In the fourth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV), pathological gambling was categorized as an impulse control disorder. However, DSM-5 introduces a new classification that encompasses non-substance-related disorders alongside addictive and substance-related disorders.²

Substances were formed, and gambling disorder is placed as the first behavioral addiction in this category; thus, pathological gambling as a gambling disorder is placed in the category of behavioral addiction in the group of addictive and substance-related disorders.³

The American Psychiatric Association rationalizes that behaviors such as gambling can activate the brain's reward system, akin to substance abuse. Gambling disorder symptoms are somewhat similar to substance

use disorder (symptoms such as tolerance, withdrawal, change in mood, and loss of control), a mental disorder caused by gambling behavior.⁴

The results of studies show that the rate of major depression and dysthymia, as well as generalized anxiety, phobia, and panic, in pathological gamblers is 3 times higher than in non-gamblers. Pathological gamblers report more other problems such as job dismissal, divorce, mental problems, poor public health, and bankruptcy,^{5,6} and even people who gamble recreationally have a high rate of abuse; they report dependence on alcohol and drugs, depression, and even imprisonment.⁷

Presently, the internet is used by over 4.5 billion individuals globally,⁸ including more than 70% of Iranians, much more than in other countries.⁹ It represents a novel style and lifestyle,¹⁰ permeating various facets of human existence, encompassing work, education, entertainment, and science.¹¹

The rapid global expansion of the internet has led



to much research and studies in the field of problems related to the increase in popularity and frequency of internet use.¹²

One of the negative and problematic aspects of internet use is related to online gambling. This type of gambling is due to lack of identity recognition, convenience and ease of use, easy access with lower cost and playing games at home and at any time and place, social acceptance, attractiveness and structure of the game, and a greater number of products and greater flexibility of this type of gambling. It is increasing day by day, along with small bets.¹³⁻¹⁷

It also provides gamblers with more opportunities for multiple games because there are opportunities for players to participate in multiple games at the same time, and the additional betting opportunities (e.g. various casino games, sports betting, poker) lead to a higher perception of winning through multiple opportunities.¹³

According to surveys, the number of gambling websites per year increased from 15 in 1995 to 2,335 in 2010.¹⁸ According to annual surveys, the value of the global online gambling market reached 25 billion euros between 2017 and 2020. It is expected to exceed 100 billion dollars by 2025, indicating a substantial increase in revenue. This revenue is primarily generated through sports betting, lotteries, and casinos.^{14,19}

Studies have shown that gambling problems, including problems related to sleep and its quality, due to 24-hour access and playing during regular sleeping hours,²⁰ increase in gambling, followed by an increase in risk and financial losses and the risk of continued problem behavior self-organization to a critical point due to the use of digital forms of money such as payment through credit cards or electronic wallets and lack of understanding of real money,^{17,21,22} disordered eating patterns²³ simultaneity of other behaviors high risk with gambling such as alcohol and cannabis consumption¹⁸ simultaneous participation in several different forms of gambling among online gambling participants was significantly higher than offline gambling participants; thus, online gambling can be a risk factor for gambling problems,^{17,21,24} and one of the significant and worrying aspects of online gambling is that online gamblers are less likely to recognize their gambling-related problems than offline gamblers.²⁵

This type of gambling is growing significantly due to the advancement of technology and increasing access to the internet and having devices equipped with the internet such as mobile phones, laptops, computers, etc.¹⁶ In this model of gambling, people can play and bet in a private space without social interaction at any time and place only by connecting to the internet at high speed and receive immediate feedback.

As a result, gamblers can gamble continuously, and most online sites are linked to each other. They encourage gamblers to play other types as well. These conditions

increase gambling prevalence and even cause a significant jump in the number of people who gamble recreationally. Therefore, these conditions may be an opportunity for people who regularly gamble. Do not let them gamble pathologically.^{16,17,26-28}

Based on the evidence, a clear correlation exists between the availability of gambling opportunities and the escalation of associated problems.²¹ Consequently, online gambling, offering greater accessibility, serves as a catalyst for the development and exacerbation of gambling issues.^{26,29,30}

Despite these conditions, one of the most critical limitations of this field (online gambling) is the lack of questionnaires specific to online gambling. Currently, tools related to physical gambling are usually used to measure the characteristics and metrics of online gambling. Recently, a scientific approach has been taken toward using online gambling tools with online gambling topics. To the best of our knowledge, there are currently no instruments to assess the consequences of problematic online gambling.

However, in the study conducted by Kalkan and Griffiths,³¹ the physical gambling consequence tool was updated, and changes were made to its items. The final version of this tool included 12 items. These items were scored from 0 (not at all) to 4 (extremely). This tool was evaluated in 326 American students (in English). The results of exploratory factor analysis (EFA) showed that this tool has 3 factors and has appropriate psychometric characteristics. As mentioned from the beginning, the trend of online gambling in Iran is increasing widely. In light of the aforementioned description, the present study sought to examine the psychometric properties of this scale within an Iranian population.

Methods

Participants

One hundred eighty-seven participants (aged 18 to 76 years) volunteered to participate in the present study through an online survey on the Porsline survey site (a Persian site similar to Google form but more comprehensive). In addition to Porsline, the Porsline form was published on social media (Telegram, WhatsApp, and Instagram). This online questionnaire took about 15 minutes to complete. Data collection lasted from the 23rd of September 2021 to the 20th of November 2021.

Study criteria

Inclusion criteria included self-confirmation of (a) being at least 18 years old, (b) being a citizen of Iran, and (c) being present and betting on one of the online gambling sites at least once a month for 3 months (this criterion was confirmed based on 2 questions: first, confirming that he/she was active in online gambling sites once a month. Second, more than 3 months have passed since

this activity). All participants completed the study anonymously and provided informed consent online.

Exclusion criteria included (a) unwillingness to continue participating in the study, (b) existence of a random answering pattern, and (c) having neurological problems, which were evaluated as self-report.

Sample size

According to the research guidelines, between 10 and 20 people should be included in the study for each item.³² Accordingly, 15 people were selected for each item. Finally, a sample size of 180 subjects was initially selected, accounting for a 10% attrition rate, resulting in a final sample of 198 individuals.

Measures

Demographic characteristics: Demographic characteristics related to people's social aspects (e.g., age, gender, education level) were placed at the beginning of the online survey form.

Online Gambling Symptom Assessment Scale (OGSAS): The OGSAS used in this study aims to evaluate the psychometric characteristics of this tool. This scale assesses symptoms of gambling behavior within the context of online gambling activity over the preceding week. Items 1 to 4 appraise the typical utilization of online gambling, while items 5 to 7 evaluate the frequency of online gambling. Item 8 quantifies the duration spent engaging in online gambling activities or related behaviors, item 9 measures the level of excitement derived from online gambling, and item 10 examines the satisfaction derived from winning online. Emotional distress attributed to online gambling is evaluated in item 11, while item 12 focuses on personal difficulties arising from online gambling. Each item is assessed on a scale spanning from 0 to 4. The total score ranges from 0 to 48, with individuals classified into mild symptoms (8 to 20), moderate symptoms (21 to 30), severe symptoms (31 to 40), or extreme symptoms (41 to 48) of online gambling behavior. All items inquire about the average symptoms experienced over the preceding 7 days. The validity and reliability of this scale have been evaluated in the current study.

Gambling Severity Scale: Gambling severity was assessed using the Persian Gambling Disorder Screening Questionnaire (GDSQ-P). GDSQ-P consists of 27 questions designed according to DSM-5. These 27 questions are scored as "yes = 1 and no = 0". Scores ranging from 0 to 3 indicate the absence of pathological gambling disorder, while scores of 4 and 5 indicate a mild disorder. Scores of 6 and 7 suggest moderate severity, and scores above 7 indicate a severe pathological gambling disorder. According to Maarefvand et al., this scale is suitable for use in the Iranian population with a high reliability level ($\alpha = 0.95$). In addition, the cutoff threshold for GDSQ-P

was determined to be 98.9% for sensitivity and 98.3% for specificity.³³

Patient Health Questionnaire-9 Items (PHQ-9): The World Health Organization (WHO) has recently recommended PHQ-9 as a useful tool with high specificity and ease of use for the screening and assessment of depression and anxiety that is based on the diagnostic criteria for major depressive disorder. Farrahi et al found that the Persian version of this scale is highly suitable for use in the Iranian population. They found that all questions were included in 1 factor and explained 47.59% of the total variance. Also, they found that this scale has suitable convergent and divergent validity.³⁴

Generalized Anxiety Disorder Questionnaire: In this study, the seven-question scale of Generalized Anxiety Disorder (GADQ-7) was employed. GADQ-7 was originally designed and developed by Spitzer et al in 2006.³⁵ The initial version of the questionnaire comprised 13 items and underwent evaluation between 2004 and 2005 across 15 primary care clinics in the United States, involving 2,740 adult patients. Finally, 7 phrases were selected for the final version. The findings of the initial study underscored the appropriate validity, reliability, and high diagnostic accuracy of this tool. Comprising a total of 7 items, the Persian version's outcomes, as elucidated in the research by Naeinian et al,³⁶ align with this assessment, showing that GADQ-7 has a suitable Cronbach's alpha, and the reliability coefficient of the scale was also evaluated based on the test-retest. Based on the obtained results, Cronbach's alpha coefficient was calculated to be 0.85, while the intraclass correlation coefficient was determined to be 0.48. These values suggest a high level of internal consistency and retest reliability for GADQ-7.

Persian translation

The translation of the instrument was conducted by a doctoral student specializing in clinical psychology alongside an English teacher possessing over 10 years of experience in English language instruction. Then, 2 PhDs in clinical psychology compared and approved this test's original and translated versions. Then, this tool was presented to 30 psychology students, and they were asked to identify ambiguous items while answering the questions. Ultimately, the tool was rewritten according to the changes approved by the people and a PhD in clinical psychology.

Statistical analysis

The data underwent analysis using SPSS software version 25 and Lisrel software. The analysis included descriptive statistics to summarize the data, Cronbach's alpha to assess internal consistency, correlation analysis between PHQ-9 and GADQ-7 to evaluate convergent validity, and confirmatory factor analysis to examine construct validity.

Results

Demographic profile

This study was conducted on 198 people who met inclusion criteria. After receiving completed online questionnaires, 11 people were excluded due to contradictions in the information provided. Finally, the results were analyzed on 187 people. The average age of the participants was 5.58 ± 25 years, of whom 75 (40.1%) were women. In terms of education, 69 people (36.9%) had a diploma or sub-diploma, 57 people (30.5%) were undergraduate or medical students, and 61 people (32.6%) were in the graduate level (graduated or graduate student) or doctorate. Questionnaires were collected from different places online. The demographic and gambling-related characteristics are shown in detail in Table 1.

Exploratory factor analysis

In this study, EFA was first investigated. In this regard, factor analysis was done using SPSS software. In this method, correlations below 0.4 were suppressed and removed. The ecomax rotation method (one of the orthogonal rotations) was used. This method combines varimax and covarimax, simplifying the components (columns) and variables (rows) in a factor matrix. In fact, this method pays attention to both the simple structure inside the variables (rows) and the simple structure inside the factors (columns).

The Kaiser-Meyer-Olkin (KMO) results showed that the proximity of this value to number 1 indicates the strength of the prediction model and justifies the possibility of using EFA (KMO=0.843). Finally, using the EcoMax rotation, the results showed that the 3-factor model of this scale provided the highest level of predictability. In fact, the 3-factor model includes 54.8% of the squared load. Table 2 shows the items related to each subscale in detail.

Table 1. Description of demographic variables

Variable	Types	Number (%)
Gender	Male	112 (59.9%)
	Female	75 (40.1%)
Economic situation	Low	51 (27.3%)
	Medium	80 (42.3%)
	Good	56 (29.9%)
Educational status	Diploma or sub-diploma	69 (36.9%)
	Bachelor or medical student	57 (30.5%)
	Master's degree or PhD	61 (32.6%)
The most favorite type of game	Crash	53 (28.3%)
	Roulette	10 (5.3%)
	Poker	10 (5.3%)
	Magic wheel	16 (8.6%)
	Dice game	18 (9.6%)
	Sports betting	77 (41.2%)
	Other	3 (1.6%)

As indicated in this table, items 4 and 7 of the second subscale, 9 and 10 of the third subscale, and the remaining items (including 8 items) make up the first subscale.

Reliability

To assess reliability, internal consistency was evaluated using Cronbach's alpha method. The findings indicated that the internal consistency, as measured by Cronbach's alpha, was 0.807. It was observed that the removal of all questions (except question 9) would decrease the alpha level, suggesting the suitability of the questions (Table 3). Also, for the first subscale, Cronbach's alpha is 0.83; for the second subscale, this amount was 0.62, and finally, the last subscale (third scale) had Cronbach's alpha of 0.34.

Validity

To evaluate convergent validity, correlations between OGSAS, GDSQ-P, PHQ-9, and GADQ-7 were examined. As presented in Table 4, OGSAS displayed notable correlations with the other scales, affirming its convergent validity.

Discussion

The results of the present study showed that P-OGSAS had appropriate psychometric characteristics. In addition, this scale, like the original version, has 3 subscales, and these scales have convergent/divergent validity. In the Persian version, as in the original version, the first subscale includes items 2, 6, 11, 12, 3, 5, 1, and 8, the second subscale includes 9 and 10, and finally, the third subscale includes items 4 and 7 (consists of subscales). As shown in the results, it includes 54.8% of the squared load in the 3-factor version, while in the original version, this amount is about 60%. Despite the lower squared load in the Persian version, this amount (54.8%) is a significant

Table 2. Matrix of rotated components

	Subscales		
	1	2	3
OGSAS1	0.588		
OGSAS2	0.458		
OGSAS3	0.712		
OGSAS4		0.857	
OGSAS5	0.674		
OGSAS6	0.617		
OGSAS7		0.790	
OGSAS8	0.734		
OGSAS9			0.690
OGSAS10			0.825
OGSAS11	0.679		
OGSAS12	0.674		

proportion to the number of items (12).³⁷

Initial evaluations were conducted to assess the reliability of P-OGSAS. OGSAS exhibited a commendable level of reliability in this investigation ($\alpha=0.807$). In comparison, the developers of the original OGSAS reported a Cronbach's alpha reliability coefficient of 0.83. The original physical gambling-based version of the G-SAS instrument reported both 1- and 2-factor models, whereas the most recent psychometric study of the G-SAS did not present any factor solution. However, the original version of the OGSAS documented a 3-factor solution, suggesting the suitability of this adaptation. The replication of these findings in the Persian version indicates that P-OGSAS preserves the same factors across both Persian and English cultures, underscoring the explanatory efficacy of these items.

We found that gambling symptoms significantly correlate with depression (PHQ-9), worry, and anxiety symptoms (GADQ-7). These findings corroborate those of prior investigations. For example, in a systematic review, authors showed that pathological gambling is highly associated with the presence and severity of depressive symptoms, which aligns with our paper's results.³⁸ Regarding anxiety, a study

in non-treatment-seeking young adults found a significant association between gambling severity and anxiety/worry level in these patients, which was in line with the present study results.³⁹

A person who develops a gambling addiction may quickly show signs of despair. Losing money, experiencing conflicts in personal relationships, or encountering other negative effects of gambling may lead a person to become unhappy and anxious about their circumstances, ultimately contributing to the formation of a vicious cycle.³⁸

Despite the encouraging findings of the present investigation, several limitations were identified. A notable constraint pertained to the veracity of participant responses to the items within the Persian version. Certain elements of the instrument may have elicited discomfort or apprehension among participants, given the illegal status of online gambling in Iran, thus potentially influencing the precision of their responses. Furthermore, online self-report data are vulnerable to an array of biases, encompassing memory recall and social desirability biases. Furthermore, it pertained to the sample selection process, which used non-probability sampling, potentially resulting in a biased sample. Additionally, the sample size was modest, albeit considerably smaller than the original OGSAS study. The study's data were sourced from individuals within social networks; hence, they were not necessarily reflective of the broader population across the country and all demographic strata. Future psychometric investigations of OGSAS should aim for more representative samples encompassing diverse age groups and patterns of online gambling behavior. Further research into online gambling should also focus on refining this culturally adapted version and identifying individuals at risk of online gambling problems. Please refer to the Appendix for a comprehensive list of all items in the OGSAS.

Conclusion

The findings of the current paper demonstrate that the adapted OGSAS tool is both reliable and valid for assessing symptoms of online gambling disorder within the Iranian population. Student counseling centers and

Table 3. Analysis of each item for the questionnaire

Items	Mean if this item is removed	Squared multiple correlation	Item correlation correction	Cronbach's alpha if the item is removed
OGSAS1	19.5829	73.406	0.630	0.777
OGSAS2	19.7005	75.888	0.474	0.791
OGSAS3	19.5936	74.630	0.512	0.787
OGSAS4	19.6203	79.430	0.330	0.803
OGSAS5	19.6631	73.364	0.568	0.782
OGSAS6	19.6203	71.871	0.594	0.779
OGSAS7	19.5775	79.192	0.357	0.801
OGSAS8	19.6203	74.527	0.537	0.785
OGSAS9	19.1176	80.760	0.256	0.810
OGSAS10	19.2888	84.142	0.129	0.802
OGSAS11	19.5936	73.350	0.561	0.782
OGSAS12	19.7273	75.264	0.508	0.788

Table 4. Pearson correlation between OGSAS subscales

	OGSAS general score	OGSAS first subscale	OGSAS subscale II	OGSAS subscale III	GADQ-7	PHQ-9	GDSQ-P
OGSAS general score	1	0.95**	0.55**	0.32**	0.31**	0.43**	0.54**
OGSAS first subscale		1	0.35**	0.21**	0.27**	0.40**	0.46**
OGSAS subscale II			1	0.11	0.16**	0.22**	0.49**
OGSAS subscale III				1	0.15*	0.13	0.28**
GADQ-7					1	0.25**	0.22**
PHQ-9						1	0.26**
GDSQ-P							1

OGSAS, Online Gambling Symptom Assessment Scale; PHQ-9, The Patient Health Questionnaire-9 Items; GDSQ-P, Persian Gambling Disorder Screening Questionnaire; GADQ-7, Generalized Anxiety Disorder Questionnaire.

psychiatrists can use the Persian version of this scale to identify individuals exhibiting potential symptoms of online gambling disorder, enabling the development of tailored treatment approaches for those experiencing adverse consequences, particularly in the online realm.

Acknowledgments

The authors would also like to acknowledge the contribution of all subjects who participated in this research.

Authors' Contribution

Conceptualization: Mohammadreza Davoudi, Sahar Aliyaki.

Formal analysis: Tayebeh Azarmehr, Zahra Khalili, Sarah Salehi Inanloo.

Investigation: Sahar Aliyaki, AmirHossein Sadeghi, Fereshte Momeni.

Methodology: Tayebeh Azarmehr, Zahra Khalili, Fereshte Momeni.

Project administration: Mohammadreza Davoudi, Sahar Aliyaki.

Resources: Tayebeh Azarmehr, Zahra Khalili, AmirHossein Sadeghi.

Supervision: Sahar Aliyaki, Fatemeh Abdoli, Sarah Salehi Inanloo, Fereshte Momeni.

Validation: Mohammadreza Davoudi, Zahra Khalili, Sarah Salehi Inanloo, AmirHossein Sadeghi.

Visualization: Fatemeh Abdoli, Zahra Khalili, AmirHossein Sadeghi, Fereshte Momeni.

Writing—original draft: Mohammadreza Davoudi, Tayebeh Azarmehr, Fereshte Momeni.

Writing—review & editing: Mohammadreza Davoudi, Fatemeh Abdoli, Fereshte Momeni.

Competing Interests

The authors affirm that they do not possess any competing interests.

Data Availability Statement

Upon reasonable request, the corresponding author will furnish the datasets utilized and/or analyzed during the course of the present study.

Ethical Approval

All methodologies employed in this study involving human participants strictly adhered to the ethical standards set forth by the research committee of the Kerman Neuroscience Research Center (code: EC/1400-75/KNRC). Prior to the initiation of research procedures, written informed consent was obtained from all participants, ensuring their right to withdraw from the project at any stage without facing any adverse consequences. The entire study was conducted in strict accordance with relevant guidelines, regulations, and the principles outlined in the Declaration of Helsinki.

Funding

None.

References

- Ashley LL, Boehlke KK. Pathological gambling: a general overview. *J Psychoactive Drugs*. 2012;44(1):27-37. doi: [10.1080/02791072.2012.662078](https://doi.org/10.1080/02791072.2012.662078).
- First MB. *DSM-5-TR® Handbook of Differential Diagnosis*. Washington, DC: American Psychiatric Association (APA); 2024.
- Dowling NA. Issues raised by the DSM-5 internet gaming disorder classification and proposed diagnostic criteria. *Addiction*. 2014;109(9):1408-9. doi: [10.1111/add.12554](https://doi.org/10.1111/add.12554).
- Maclaren VV, Fugelsang JA, Harrigan KA, Dixon MJ. The personality of pathological gamblers: a meta-analysis. *Clin Psychol Rev*. 2011;31(6):1057-67. doi: [10.1016/j.cpr.2011.02.002](https://doi.org/10.1016/j.cpr.2011.02.002).
- Corbeil O, Anderson É, Bécharde L, Desmeules C, Huot-Lavoie M, Bachand L, et al. Problem gambling in psychotic disorders: a systematic review and meta-analysis of prevalence. *Acta Psychiatr Scand*. 2024. doi: [10.1111/acps.13686](https://doi.org/10.1111/acps.13686).
- Brodeur M, Audette-Chapdelaine S, Savard AC, Kairouz S. Gambling and the COVID-19 pandemic: a scoping review. *Prog Neuropsychopharmacol Biol Psychiatry*. 2021;111:110389. doi: [10.1016/j.pnpbp.2021.110389](https://doi.org/10.1016/j.pnpbp.2021.110389).
- Desai RA, Maciejewski PK, Dausey DJ, Caldarone BJ, Potenza MN. Health correlates of recreational gambling in older adults. *Am J Psychiatry*. 2004;161(9):1672-9. doi: [10.1176/appi.ajp.161.9.1672](https://doi.org/10.1176/appi.ajp.161.9.1672).
- Çetin M, Gümüş R. Research into the relationship between digital health literacy and healthy lifestyle behaviors: an intergenerational comparison. *Front Public Health*. 2023;11:1259412. doi: [10.3389/fpubh.2023.1259412](https://doi.org/10.3389/fpubh.2023.1259412).
- Modara F, Rezaee-Nour J, Sayehmiri N, Maleki F, Aghakhani N, Sayehmiri K, et al. Prevalence of internet addiction in Iran: a systematic review and meta-analysis. *Addict Health*. 2017;9(4):243-52.
- Priego-Parra BA, Triana-Romero A, Pinto-Gálvez SM, Ramos CD, Salas-Nolasco O, Reyes MM, et al. Anxiety, depression, attitudes, and internet addiction during the initial phase of the 2019 coronavirus disease (COVID-19) epidemic: a cross-sectional study in México. *medRxiv [Preprint]*. May 15, 2020. Available from: <https://www.medrxiv.org/content/10.1101/2020.05.10.20095844v1>.
- Chou C, Condron L, Belland JC. A review of the research on internet addiction. *Educ Psychol Rev*. 2005;17(4):363-88. doi: [10.1007/s10648-005-8138-1](https://doi.org/10.1007/s10648-005-8138-1).
- Fumero A, Marrero RJ, Voltes D, Peñate W. Personal and social factors involved in internet addiction among adolescents: a meta-analysis. *Comput Human Behav*. 2018;86:387-400. doi: [10.1016/j.chb.2018.05.005](https://doi.org/10.1016/j.chb.2018.05.005).
- McCormack A, Shorter GW, Griffiths MD. An examination of participation in online gambling activities and the relationship with problem gambling. *J Behav Addict*. 2013;2(1):31-41. doi: [10.1556/jba.2.2013.1.5](https://doi.org/10.1556/jba.2.2013.1.5).
- Díaz A, Pérez L. Online gambling-related harm: findings from the study on the prevalence, behavior and characteristics of gamblers in Spain. *J Gamb Stud*. 2021;37(2):599-607. doi: [10.1007/s10899-020-09966-x](https://doi.org/10.1007/s10899-020-09966-x).
- Davoudi M, Shirvani S, Foroughi A, Rajaeiramsheh F. Online gambling in Iranian social media users: prevalence, related variables and psychiatric correlations. *J Gamb Stud*. 2022;38(2):397-409. doi: [10.1007/s10899-021-10020-7](https://doi.org/10.1007/s10899-021-10020-7).
- Gainsbury SM. Online gambling addiction: the relationship between internet gambling and disordered gambling. *Curr Addict Rep*. 2015;2(2):185-93. doi: [10.1007/s40429-015-0057-8](https://doi.org/10.1007/s40429-015-0057-8).
- Gainsbury SM, Russell A, Hing N, Wood R, Blaszczynski A. The impact of internet gambling on gambling problems: a comparison of moderate-risk and problem internet and non-internet gamblers. *Psychol Addict Behav*. 2013;27(4):1092-101. doi: [10.1037/a0031475](https://doi.org/10.1037/a0031475).
- Kairouz S, Paradis C, Nadeau L. Are online gamblers more at risk than offline gamblers? *Cyberpsychol Behav Soc Netw*. 2012;15(3):175-80. doi: [10.1089/cyber.2011.0260](https://doi.org/10.1089/cyber.2011.0260).
- Jiménez-Murcia S, Giménez M, Granero R, López-González H, Gómez-Peña M, Moragas L, et al. Psychopathological status and personality correlates of problem gambling severity in sports bettors undergoing treatment for gambling disorder. *J Behav Addict*. 2021;10(3):422-34. doi: [10.1556/2006.2020.00101](https://doi.org/10.1556/2006.2020.00101).

20. Hamel A, Bastien C, Jacques C, Moreau A, Giroux I. Sleep or play online poker?: Gambling behaviors and tilt symptoms while sleep deprived. *Front Psychiatry*. 2020;11:600092. doi: [10.3389/fpsy.2020.600092](https://doi.org/10.3389/fpsy.2020.600092).
21. Matthews N, Farnsworth B, Griffiths MD. A pilot study of problem gambling among student online gamblers: mood states as predictors of problematic behavior. *Cyberpsychol Behav*. 2009;12(6):741-5. doi: [10.1089/cpb.2009.0050](https://doi.org/10.1089/cpb.2009.0050).
22. Wood RT, Williams RJ, Lawton PK. Why do internet gamblers prefer online versus land-based venues? Some preliminary findings and implications. *J Gambl Issues*. 2007;20:235-52.
23. Gainsbury S, Parke J, Suhonen N. Consumer attitudes towards internet gambling: perceptions of responsible gambling policies, consumer protection, and regulation of online gambling sites. *Comput Human Behav*. 2013;29(1):235-45. doi: [10.1016/j.chb.2012.08.010](https://doi.org/10.1016/j.chb.2012.08.010).
24. Wood RT, Williams RJ. Problem gambling on the internet: implications for internet gambling policy in North America. *New Media Soc*. 2007;9(3):520-42. doi: [10.1177/1461444807076987](https://doi.org/10.1177/1461444807076987).
25. Petry NM. Internet gambling: an emerging concern in family practice medicine? *Fam Pract*. 2006;23(4):421-6. doi: [10.1093/fampra/cml005](https://doi.org/10.1093/fampra/cml005).
26. Gainsbury S, Wood R. Internet gambling policy in critical comparative perspective: the effectiveness of existing regulatory frameworks. *Int Gambl Stud*. 2011;11(3):309-23. doi: [10.1080/14459795.2011.619553](https://doi.org/10.1080/14459795.2011.619553).
27. Bonnaire C. [Internet gambling: what are the risks?]. *Encephale*. 2012;38(1):42-9. doi: [10.1016/j.encep.2011.01.014](https://doi.org/10.1016/j.encep.2011.01.014). [French].
28. Griffiths MD, Kuss DJ, Pontes HM, Billieux J. Where do gambling and internet 'addictions' belong? The status of 'other' addictions. In: Wolff K, White J, Karch S, eds. *The SAGE Handbook of Drug & Alcohol Studies: Biological Approaches*. SAGE Publications Ltd; 2016. p. 446-70.
29. Adams GR, Sullivan AM, Horton KD, Menna R, Guilmette AM. A study of differences in Canadian university students' gambling and proximity to a casino. *J Gambl Issues*. 2007;19(19):9-17.
30. Hing N, Cherney L, Gainsbury SM, Lubman DI, Wood RT, Blaszczynski A. Maintaining and losing control during internet gambling: a qualitative study of gamblers' experiences. *New Media Soc*. 2015;17(7):1075-95. doi: [10.1177/1461444814521140](https://doi.org/10.1177/1461444814521140).
31. Kalkan B, Griffiths MD. The psychometric properties of the Online Gambling Symptom Assessment Scale (OGSAS). *Int J Ment Health Addict*. 2021;19(2):303-13. doi: [10.1007/s11469-018-9981-x](https://doi.org/10.1007/s11469-018-9981-x).
32. Anthoine E, Moret L, Regnault A, Sébille V, Hardouin JB. Sample size used to validate a scale: a review of publications on newly-developed patient reported outcomes measures. *Health Qual Life Outcomes*. 2014;12:176. doi: [10.1186/s12955-014-0176-2](https://doi.org/10.1186/s12955-014-0176-2).
33. Maarefvand M, Mardaneh-Jobehdar M, Ghiabi M, Rafimanesh H, Mohammadi A, Morshedi Z, et al. Designing and evaluating the validity and reliability of the Persian gambling disorder screening questionnaire. *Addict Health*. 2019;11(2):110-9. doi: [10.22122/ahj.v11i2.235](https://doi.org/10.22122/ahj.v11i2.235).
34. Farrahi H, Gharraee B, Oghabian MA, Zare R, Pirmoradi MR, Najibi SM, et al. Psychometric properties of the Persian version of patient health questionnaire-9. *Iran J Psychiatry Clin Psychol*. 2021;27(2):248-63.
35. Spitzer RL, Kroenke K, Williams JB, Löwe B. A brief measure for assessing generalized anxiety disorder: the GAD-7. *Arch Intern Med*. 2006;166(10):1092-7. doi: [10.1001/archinte.166.10.1092](https://doi.org/10.1001/archinte.166.10.1092).
36. Naeinian MR, Shaeiri MR, Sharif M, Hadian M. To study reliability and validity for a brief measure for assessing generalized anxiety disorder (GAD-7). *Clinical Psychology and Personality*. 2011;9(1):41-50. [Persian].
37. Beavers AS, Lounsbury JW, Richards JK, Huck SW, Skolits GJ, Esquivel SL. Practical considerations for using exploratory factor analysis in educational research. *Pract Assess Res Eval*. 2019;18(1):6. doi: [10.7275/qv2q-rk76](https://doi.org/10.7275/qv2q-rk76).
38. Richard J, Fletcher É, Boutin S, Derevensky J, Temcheff C. Conduct problems and depressive symptoms in association with problem gambling and gaming: a systematic review. *J Behav Addict*. 2020;9(3):497-533. doi: [10.1556/2006.2020.00045](https://doi.org/10.1556/2006.2020.00045).
39. Medeiros GC, Sampaio DG, Leppink EW, Chamberlain SR, Grant JE. Anxiety, gambling activity, and neurocognition: a dimensional approach to a non-treatment-seeking sample. *J Behav Addict*. 2016;5(2):261-70. doi: [10.1556/2006.5.2016.044](https://doi.org/10.1556/2006.5.2016.044).