Psychometric Properties of the Farsi Version of the Gaming Disorder Scale for Adolescents

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Research Article

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Abstract

Background

Gaming disorder was added to the 11th international classification of disorders by the World Health Organization in early 2019. Adolescents are the most vulnerable group in this area, thus a screening tool for this age range is essential. This study aims to examine psychometric properties of the Gaming Disorder Scale for Adolescents (GADIS-A) in Iranian male sample.

Methods

260 students -7th to 12th grade- of Isfahan city in the academic year 2020-21 were selected using convenience sampling. The participants responded to the Farsi version of the GADIS-A and problematic online game questionnaire (POGQ). Thirty participants answered the scale again to assess validity of the retest. Pearson's correlation analysis, Cronbach's alpha and confirmatory factor analysis were used in this research. The data were analyzed by SPSS version 24 and LISREL version 8.8.

Results

Confirmatory factor analysis revealed that the two-factor model, which included cognitive-behavioral symptoms and negative consequences, had good fitness indices. The GADIS-A convergent validity is confirmed by the scale's significant correlation with the POGQ. Cronbach's alpha coefficient was used to determine the scale's validity, which was 0.85 for the full scale and 0.70 and 0.75 for two factors. The validity of the retest after two weeks also showed a correlation of 0.88.

Conclusion

The Farsi version of the Gaming Disorder Scale for adolescents has a two-factor structure and is valid for use in Iran.

Introduction

People play games for many reasons: relaxation, challenge, social interaction, and recreation [1]. For most, gaming is an enjoyable activity and can improve social and cognitive skills [2], and also are helpful in the teaching process [3]. Although gaming has some benefits [4], playing without limits can be addictive [5] and cause negative consequences [6]. As a result, "Internet Gaming Disorder" (IGD) was added to Section III of the DSM-5 as a diagnosis that needs further research in 2013 [7]. IGD consists of nine criteria that apply to online gaming or gaming on any electronic device: (1) preoccupation with gaming, (2) withdrawal when not playing, (3) tolerance, (4) unsuccessful attempts to reduce or stop gaming, (5) giving up other activities, (6) continued gaming despite problems, (7) deception or covering

up gaming, (8) gaming to escape negative moods, and (9) risking or losing relationships or career opportunities as a result of excessive gaming [8].

In addition, Gaming disorder was added to the 11th edition of the International Classification of Diseases (ICD-11) by the World Health Organization in early 2019. To diagnose gaming disorder, the following three criteria must be present: a consistent and recurrent pattern of gaming activity (digital or video games) offline or online; (1) inability to control the game, (2) prioritization of the game above other activities, and (3) continuation or escalation of the game despite negative consequences [9].

The criteria for this disorder are different in ICD-11 and DSM-5 [10, 11]. DSM, for example, highlights online games, but ICD states that these games can be played either offline or online. Studies examining the prevalence of IGD usually report lower rates than those investigating GD [12]; this is probably why Starcevic (2013) considers IGD as a subtype of GD [13]. As a result, IGD instruments aren't designed to detect this condition among offline players (e.g., consoles, smartphones, etc.) Due to considering the term "online" [12].

On the other hand, children and adolescents are more susceptible to GD due to immaturity and limited cognitive capacity [14–16]. The most prevalent concerns among GD adolescents include sleep disorders, unsatisfactory school grades, family disputes, emotional and behavioral problems [17]. According to neuroimaging findings, adolescents with GD and those with drug use disorders have similar brain functions [18, 19].

Epidemiological studies indicated adolescents have a higher prevalence rate of GD [20, 21]. GD prevalence among children and adolescents in different countries and samples is reported in the range of 2–13% [22, 23]. The meta-analysis shows that the prevalence rate among adolescents is about 4.6%. In this estimate, boys (6.8%) are more likely to show different clinical levels of gaming problems than girls (1.3%) [12]. It is important to note that being male is one of the risk factors for GD [24, 25], and also this disorder is five times more prevalent in boys than in girls [24]. According to the Digital Games Research Center (2019), 32 million Iranians play for an average of 93 minutes each day. Children and adolescents aged 3 to 17 account for 42% of the participants. Children spend an average of 86 minutes per day gaming, whereas adolescents spend 147 minutes [26].

According to the importance of research in the field of gaming disorder, this study aims to determine the validity and reliability of the Farsi version of the gaming disorder scale for adolescents (GADIS-A) [27] in Iranian male adolescents.

Methods

Participants and study design

Dr. Paschke permitted the scale to be translated and normalized in Iran. The researcher translated GADIS-A items into Farsi, and one psychologist fluent in English corrected them. The translation's authenticity

was also confirmed by having these items translated back into English by a professional translator. Seven psychology professors approved the content validity of the translated scale with clinical and psychometric experience.

By convenience sampling, 260 male Isfahan students in grades 7 to 12 were chosen to complete the GADIS-A. For convergent validity, 50 individuals were randomly chosen to fill out the problematic online gaming questionnaire (POGQ). For the reliability retest, 30 individuals were randomly selected among those who left their phone numbers, and two weeks after the first performance, they filled the scale again.

Measures

Gaming disorder scale for adolescents (GADIS-A)

This scale was developed in 2020 by Paschke and colleagues [27]. It contains nine symptom items with five (Likert-scale) response options (0-strongly disagree, 1- somewhat disagree, 2-partially disagree/partially agree, 3-somewhat agree, 4-strongly agree), as well as one additional question regarding symptoms frequency with four response options (0-not at all, 1- only on single days, 2-longer periods, 3-nearly daily). The ICD-11 criteria and corresponding DSM-5 criteria are taken into consideration in these statements. Cognitive-behavioral symptoms (CBS), which are examined with four questions, with a cut-off point of 9, and negative consequences (NS), which are assessed with five questions with a cut-off point of 5, are the two subscales. To be diagnosed with GD, someone must score over the cut-off in both CBS and NS, as well as pick "for longer period " or " nearly daily" in question 10.

Problematic Online Gaming Questionnaire (Pogq)

This questionnaire was developed by Demetrovics and colleagues in 2012, and it comprises 18 items [28]. There are five (Likert-scale) response options for each question. Nazari and colleagues (2015) standardized POGQ in a sample of 360 adolescent students of Tehran and reported Cronbach's alpha 0.85 [29].

Statistical analysis

The statistical methods utilized were Pearson correlation, Cronbach's alpha, and confirmatory factor analysis, and the software used was SPSS (V24) and LISREL (V8.8).

Results

The age of the participants had a mean of 15.1 and a standard deviation of 1.56. Other descriptive information of the subjects is shown in Table 1.

Validity

According to Table 2. The suitability of the items on this scale for factor analysis was evaluated using the correlation index of each item's score with the corrected total score, and This correlation for each item was more than 0.3. These correlation coefficients are all positive, indicating that all items are aligned with the total scale score [30].

Table 1
Descriptive information of subjects

	variable	N(%)	N(%)
Grade	Seventh		34 (13.1)
	Eighth		71 (27.3)
	Nineth		51 (19.6)
	Tenth		45 (17.3)
	Eleventh		43 (16.5)
	Twelveth		16 (6.2)
School type	non-profit		165 (63.5)
	Governmental		46 (17.7)
	Government model school		30 (11.5)
	Talented		19 (7.3)

Table 2
correlation items' score with the corrected total score

Item	Correlation with corrected total score	Item	Correlation with corrected total score	Item	Correlation with corrected total score
1	0.47	4	0.63	7	0.54
2	0.53	5	0.64	8	0.57
3	0.44	6	0.62	9	0.62

The Bartlett spherical and Kaiser-Meyer-Olkin (KMO) Sampling Adequacy tests were employed to test the data's suitability for factor analysis. The results of the Bartlett test ($X^2=771.05$, $P<0.0001$) were significant, indicating that factor analysis was justified. KMO=0.85, indicating that the sample is adequate.

Confirmatory factor analysis was conducted to evaluate structural validity. In this study, chi-square, the ratio of chi-square to the degree of freedom, RMSEA, GFI, CFI, NFI, NNFI, and IFI were used to evaluate the model's goodness of fitness, as shown in Table 3. Chi-square is a standard index for evaluating model fitness, and its lack of significance at the level of 0.05 implies optimal model fitness [31]. The following index is RMSEA, which, if less than 0.1, demonstrates acceptable model fitness [32] and indicates that measurement error is controlled in the model, and in this case is 0.087. GFI, CFI, NFI, NNFI, and IFI, are other indicators, can have values ranging from zero to one, with values closer to one implying better model fitness. These indicators have calculated values of 0.88, 0.84, 0.88, 0.86, and 0.85, which shows that the model is efficient. This two-factor model has good fitness, according to the confirmatory factor analysis results as shown in figure1.

Convergent validity was evaluated using the correlation of GADIS-A scores with the POGQ. The correlation between the GADIS-A and the POGQ was 0.74, which was statistically significant ($P<0.001$).

Reliability

Internal consistency and retest reliability were used to evaluate the scale's reliability. The GADIS-A has a Cronbach's alpha of 0.85, suggesting that the scale has high internal consistency. Cronbach's alpha of subscales cognitive-behavioral symptoms and negative consequences were 0.75 and 0.70, respectively. The scale was retested on 30 participants two weeks after the first performance to determine retest reliability, and the findings had a significant correlation of 0.88 ($P>0.001$), Indicating good retest reliability for this scale.

Table 3
goodness of fitness indices for confirmatory factor analysis

Goodness of fitness indices	Calculated values
Chi-square	65.77
Degree of freedom	24
P Value	0.00001
ratio of chi-square to the degree of freedom	2.74
Root Mean Square Error of Approximation (RMSEA)	0.087
Goodness of Fit Index (GFI)	0.88
Comparative Fit Index (CFI)	0.84
Normed Fit Index (NFI)	0.88
Non-normed Fit Index (NNFI)	0.86
Incremental Fit Index (IFI)	0.85

Discussion

This study aimed to examine the psychometric properties of the gaming disorder scale for adolescents.

The confirmatory factor analysis results revealed that this instrument could be utilized to assess gaming disorder according to ICD-11 criteria. Questions 1, 2, 4, and 5 are part of the first factor, referred to as cognitive-behavioral symptoms. These questions reflect an inability to control the amount of time spent playing despite the negative consequences. Research literature shows GD can cause a drop in school grade, jeopardize family, friendly and emotional relationships, and affect leisure activities [5, 33–36]. These adverse outcomes assessed in second-factor negative consequences is identified in questions 3, 6, 7, 8, and 9. The scale's final item assesses the frequency and severity of problems caused by playing for the individual. These questions are based on the ICD-11 criteria and cover all of them. On the other hand, the scale items cover the corresponding DSM-5 criteria as well.

In this study, Problematic online gaming questionnaire was used to assess convergent validity so that increasing the score in this questionnaire leads to increasing the score of the GADIS-A.

The use of a large number of samples per question was one of the study's strengths. The use of convenience sampling method and non-use of female subjects has been the limitations of this study. Future research should examine samples of adolescent girls because the lack of research in this area is significant [37]. In addition, there is a major paucity of epidemiological research on gaming disorder or internet gaming disorder in Iran. The current study's standardized scale can be used in future epidemiological studies.

Conclusion

Eventually, The Gaming Disorder Scale for Adolescents in Persian has a two-factor structure and is appropriate for use in Iran.

Declarations

Ethics approval and consent to participate

This research is based on the psychometric part of the master's dissertation in clinical psychology and was approved by the ethics committee of the psychology and educational sciences faculty of the University of Tehran (code:IR.UT.PSYEDU.REC.1399.025). Participants gave their informed consent to participate in the study, and they were informed that their information would be kept confidential. All methods were carried out in accordance with the Declaration of Helsinki and relevant guidelines and regulations. Another article related to a qualitative study on internet gaming disorder will be taken from this dissertation.

Consent to publish

Not applicable as no personal information is provided in the manuscript.

Availability of data and materials

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Conflict of interest

The authors declare that they have no conflict of interests.

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Author contribution

Data collection and writing the article: Ali Mazaherizadeh, data analysis: Hojatollah Farahani, Supervision: Zahra Taherifar.

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Figures

Figure 1. Confirmatory Factor Analysis (CFA) of the two -factor structure proposed in this study using AMOS software

Figure 1

See image above for figure legend