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Extended Abstract

Adapting the Short Form of the Internet Gaming Disorder Scale into Turkish: Validity and Reliability*

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Abstract

The nine-item Internet Gaming Disorder Scale – Short Form (IGDS9-SF) is one of the most popular instruments developed based on DSM-5 to assess gaming addiction internationally. Given the number of common instruments to assess and diagnose gaming disorder cross-culturally, validity and reliability studies of instruments such as the IGDS9-SF have become more important. Therefore, the aim of the present study was to adapt and examine psychometric properties of IGDS9-SF in Turkish. A total of 455 participants aged between 10 and 29 years were recruited to take part in the present study. Validity of the IGDS9-SF was assessed in two ways: confirmatory factor analysis (CFA) and criterion-related validity. CFA revealed that IGDS9-SF was unidimensional. A significant correlation between IGDS9-SF and Internet Addiction Scale indicated criterion-related validity. One supportive finding for the validity was the significant difference found between the upper and lower 27-percentile groups in terms of IGDS9-SF scores. The IGDS9-SF also showed satisfactory levels of reliability using Cronbach's alpha (.82), Guttman's split-half (.75), and test-retest reliability coefficient (.78). It is concluded that the IGDS9-SF appears to be a valid and reliable scale to assess IGD among Turkish adolescents and young adults.

Keywords

Internet gaming disorder • Gaming addiction • Online gaming • Computer games • Video games • Adolescents • Young adults

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Video game addiction was first reported over 30 years ago (see Soper & Miller, 1983), and with the growth of online gaming has become a rapidly-spreading public health concern in the last 20 years, especially for children and youths (Gentile et al., 2017; Griffiths, 2000; Wu, Chen, Tong, Yu, & Lau, 2018; Young, 1998). Together with the increase in epidemiological studies carried out in different countries worldwide, the need has arisen to clinically define Internet Gaming Disorder (IGD), which was included as a tentative disorder in Section 3 ('Emerging Measures and Models') of the latest (fifth) edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) published by the American Psychiatric Association (APA, 2013). Because the DSM-5 emphasizes IGD as having major significance in terms of public health, it has also emphasized the need for further research validate IGD as a genuine disorder. IGD has become a highly studied topic in various countries, and has been defined in many ways by researchers. Its assessment with different psychometric tools has led to very different rates in prevalence studies being reported, even within the same country. When looking at the worldwide literature, 12 different scales have been developed with the aim of assessing IGD (Petry et al., 2014; Pontes, 2016). In Turkey, five scales have been used for assessing IGD separately from Internet addiction. In the present study, the Internet Gaming Disorder Scale- Short Form (IGDS9-SF) was considered to be the most favorable scale for use in intercultural studies because Pontes and Griffiths (2015) developed it by applying it over participants from 58 different countries, and it has been translated into different languages. Alongside this, and because it is based on the nine IGD DSM-5 diagnostic criteria, bringing the IGDS9-SF to Turkish is important. The present study contributes to the literature by providing a scale to experts working in Turkey that can be used in both diagnosing IGD as well as contributing to national and international research.

Method

Participants

Four different study groups were used in the present study. The first group comprised 35 individuals from whom data were collected for the IGDS9-SF's linguistic equivalence study. These participants consisted of students receiving education in a private institution that teaches in English in the province of Ankara. Of these students, 46% were male and 54% were female with an average age of 12.50 years (± 1.20 years). The second group comprised 33 young adults from whom data was collected for another IGDS9-SF's linguistic equivalence study. These participants consisted of individuals learning in English at a university in Gaziantep. Of these students, 58% were male and 42% were female, with an average age of 23.94 years (± 1.52 years). The third study group comprised 475 individuals ranging in age from 10 to 29 years and from whom data were collected for the validity and reliability analyses

of the adapted scale. However, after collecting the data, the number of participants included in the analysis dropped to 455 following the removal of 20 individuals who had missing data or extreme values that disrupted the normality of distribution. These participants comprised students that were educated in the provinces of Istanbul and Gaziantep, from a middle school's fifth grade up to the final year of university. Of the participants, 54% were male and 46% were female with an average age of 15.83 years (± 4.16 years). More specifically, 12.5% were 5th graders, 11% were 6th graders, 15.6% were 7th graders, 2.6% were 8th graders, 11.9% were 9th graders, 15.8% were 10th graders, 4% were 11th graders, 5.5% were 12th graders, and 21.1% were university students. Of the participants, 2.7% perceived themselves at a low socioeconomic level, 68.5% at a medium socioeconomic level, and 28.8% at a high socioeconomic level.The fourth study group was used for calculating the test-retest reliability coefficient of the scale and was a group of 64 individuals to whom the scale was administered two weeks later. This group comprised students educated at a private teaching institution in the province of Istanbul. Of the students, 52% were male and 48% were female with an average age of 13.84 years (± 1.59 years).

Instruments

In addition to personal information that included questions on participants' gender, birth date, grade level, and perceived socioeconomic level, the study also included the Internet Addiction Scale developed by Günüç and Kayri (2010) and the Turkish version of the IGDS9-SF (hereafter named the IGDS9-SF-TR).

Procedure

First the scale was translated from English to Turkish by four expert independent of each other. The translations were sent to six specialists from different universities working in the field of psychology in order to assess the suitability of the items included on the scale after being reviewed and edited by the first author in terms of being *semantic*, *idiomatic*, *experiential*, and *conceptual*. All six experts gave their approval for each item in line with the above criteria. The items were accepted after being corrected in line with the common suggestions provided, and the scale was then ready for psychometric testing.The second stage of the scale's linguistic equivalence study consisted of the scale being applied both in English and Turkish to an adolescent and young adult group across a two-week interval. The English scale was administered at the end of February 2017 and the Turkish scale was administered in the middle of March 2017 to 35 adolescents studying in English (M_{age} = 12.50 ± 1.20). For the young adult group, the scales were administered to 33 individuals studying English in May 2017 across a 2-week interval (M_{age} = 23.94 ± 1.52). While applying the scale, no identifying information was collected from the participants and they were asked to

use nicknames. The Pearson correlation coefficient obtained for the adolescent group was.84 ($p < .001$) and .78 ($p < .001$) for the young adult group. On the basis of these significant results, it was concluded that the Turkish form of the scale had linguistic equivalence and was ready to be tested psychometrically.The Turkish form of the scale was applied alongside the Internet Addiction Scale (Günüç & Kayri, 2010) to 475 individuals receiving education in four different educational institutions in Istanbul and Gaziantep between October and December of 2017. The test-retest reliability study of the scale was conducted by applying it to 64 individuals studying in the province of Istanbul in April 2018 across a two-week interval. No identifying information was received from the participants during the testing phases. All testing was performed in groups in a class environment, and the questions took an average of 15-20 minutes to complete depending upon age. Care was taken to ensure from start to finish that all preliminary testing was completed to the highest ethical standards.

Data Analysis

All data were analyzed using the SPSS 17 statistical package. Confirmatory factor analysis was conducted using AMOS 16 (Arbuckle, 2007). When examining the raw data obtained from the 475 individuals, a total of 11 individuals had missing data (2%) on the IGDS9-SF-TR. According to Çokluk, Şekercioğlu, and Büyüköztürk (2010), because this percentage was less than 5% of the sample, the individuals with missing data were removed from the data set. This left data from 465 individuals remaining. Mahalanobis distances were calculated for detecting outliers, and the lowest and highest ten outliers were removed from the data set. Thus analyses were continued with the 455 remaining individuals. Normality of distribution was examined through skewness and kurtosis coefficients and distributions were seen to be close to normal.

Results

Confirmatory Factor Analysis for Construct Validity

The structure of the IGDS9-SF, which Pontes and Griffiths (2015) reported as being one-dimensional, was tested using AMOS 16. Compliance indices related to the model were first examined and calculated ($\chi^2/df = 4.79$, $TLI = 0.87$, $CFI = 0.90$, and $RMSEA = 0.09$). Of these values, only the *TLI* was seen to be below the expected cut-off point. Factor loadings for the items of the scale ranged between 0.39 and 0.71, and the acceptability factor was greater than the load value of 0.32 (Tabachnick & Fidell, 2001). In the original study where Pontes and Griffiths (2015) first developed the IGDS9-SF, factor loadings ranged between 0.51 and 0.72.

Criterion-related Validity

To test the IGDS9-SF-TR's criterion-related validity, it was correlated with the total scores obtained from the Internet Addiction Scale (Günüç & Kayri, 2010), which is frequently used in Turkey. The correlation between the scores obtained from both scales, which had been applied simultaneously, was examined using the Pearson product-moment correlation analysis, and a positive and medium-level significant correlation was found between the two score distributions ($r = 0.57$, $p < .001$).

Reliability Analyses

In order to calculate the IGDS9-SF's internal consistency and reliability coefficients, Cronbach's alpha and split-half reliability analyses were performed. The Cronbach alpha reliability coefficient obtained for the nine items was found to be 0.82 and the Guttman split-half reliability coefficient was 0.75. To test the IGDS9-SF-TR's consistency, the scale was applied to 64 individuals across a two-week interval. The Pearson product-moment correlation coefficient calculated between the two measurements was found to be 0.78 ($p < .001$).

Floor and Ceiling Effects

The IGDS9-SF-TR's floor and ceiling effects were also examined. The floor effect examined the percentage of individuals who answered "never" (1 point) to all items and scored a total of 9 points, and the ceiling effect examined the percentage of individuals who answered "very often" (5 points) to all items and scored a total of 45 points. According to Pontes and Griffiths (2015), floor and ceiling effect percentages greater than 15% mean that the situation is undesirable. When examining the distribution of the obtained scores, a total of 41 participants (9%) scored 9 points (floor) and no participants scored 45 points (ceiling). This distribution shows the scores do not have floor and ceiling effects. The floor and ceiling effect in the IGDS9-SF's original study were found to be negligible – 4.7% and 0.5% respectively (Pontes & Griffiths, 2015).

IGD Percentages, the Difference between Gender, and the Age-IGD Relationship

The mean IGD score obtained from the distribution ($N = 455$) was calculated as 16.92 (± 6.35). In this situation, the +3 standard deviation value coincided with 36 (16.92 + [3x635]), which Pontes and Griffiths (2015) suggested as the cut-off point. Within the 455 individuals, a total of six individuals (4 male, 2 female) were found to have scores of 36 or higher. This suggests that 1.3% of the present sample were at risk for internet gaming disorder. The answers given to the items were also examined in terms of the DSM-5 diagnostic criteria. The answers participants gave to the items were encoded as 0 (absent) for "never," "rarely," and "sometimes," and

as 1 (present) for "often" and "very often." Thus, 17 individuals (13 males, 4 women) scored at least 5 points out of 9. When viewed from this perspective, 3.7% of the sample can be said to be at risk for internet gaming disorder.Independent group *t*-test were carried out to assess the difference between male and female participants. Male participants (18.44 ± 6.34) were seen to have significantly higher levels of internet gaming disorder than women (15.12 ± 5.90; $t_{(451)} = 5.73$, $p = .001$, $d = 0.54$). Finally, as a result of the correlation analysis carried out for age and IGDS9-SF scores, no significant correlation was found ($r = 0.026$, $p = .589$).

Conclusion

As a result of all the obtained findings, the IGDS9-SF-TR is thought to be a valid and reliable measurement tool for Turkish youth in the 10-29 year age group.

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