Addictive Behaviors 64 (2017) 247–252

Contents lists available at ScienceDirect

Addictive Behaviors

journal homepage: www.elsevier.com/locate/addictbeh

Psychometric properties of the Turkish version of the Internet Addiction Test (IAT)

Murat Boysan [a,*], Daria J. Kuss [b], Yaşar Barut [c], Nafi Ayköse [d], Mustafa Güleç [e], Osman Özdemir [f]

[a] Yüzüncü Yıl University, Faculty of Arts, Department of Psychology, Van, Turkey
[b] Nottingham Trent University, Department of Psychology, Nottingham, England
[c] Ondokuz Mayıs University, Department of Psychological Counseling, Samsun, Turkey
[d] Ankara University, Department of Psychological Counseling, Ankara, Turkey
[e] İzmir Kâtip Çelebi University, Faculty of Medicine, Department of Psychiatry, İzmir, Turkey
[f] Yüzüncü Yıl University, Faculty of Medicine, Department of Psychiatry, Van, Turkey

HIGHLIGHTS

- The Turkish version of the Internet Addiction Test (IAT) has sound psychometric properties.
- Of the studies to date, the IAT revealed the highest internal and temporal reliability.
- Internet addiction is correlated with pathological dissociation and obsessionality.
- Internet addicts are more likely to cope emotionally with stressful situations.

ARTICLE INFO

Article history:
Received 21 February 2015
Received in revised form 18 August 2015
Accepted 3 September 2015
Available online 8 September 2015

Keywords:
Dissociation
Obsessive–compulsive disorder
Internet addiction
Coping
Reliability
Validity

ABSTRACT

Objective: Of many instruments developed to assess Internet addiction, the Internet Addiction Test (IAT), an expanded version of the Internet Addiction Diagnostic Questionnaire (IADQ), has been the most widely used scale in English and non-English speaking populations. In this study, our aim was to investigate the psychometric properties of short and expanded versions of the IAT in a Turkish undergraduate sample.
Method: Overall, 455 undergraduate students from Turkey aged between 18 and 30 participated in the study (63.53% were females). Explanatory and confirmatory factor analytic procedures investigated factor structures of the IADQ and IAT. The Internet Addiction Scale (IAS), Coping Inventory for Stressful Situations (CISS), Obsessive Compulsive Inventory—Revised (OCI-R) and Dissociative Experiences Scale (DES) were administered to assess convergent and divergent validities of the IADQ and IAT. Internal consistency and 15-day test–retest reliability were computed.
Results: In the factorial analytic investigation, we found a unidimensional factor structure for each measure fit the current data best. Significant but weak to moderate correlations of the IADQ and the IAT with the CISS, OCI-R and DES provided empirical evidence for divergent validity, whereas strong associations with the subscales of the IAS pointed to the convergent validity of Young's Internet addiction construct. Internal consistency of the IADQ was weak ($\alpha = 0.67$) and of the IAT was high ($\alpha = 0.93$). Temporal reliability of both instruments was very high ($\alpha = 0.81$ and $\alpha = 0.87$; respectively).
Conclusion: The IAT revealed promising and sound psychometric properties in a Turkish sample.

1. Introduction

Internet addiction is characterized by excessive and uncontrollable Internet use, and has been identified as a severe problem among young populations (Young, 1998a). Internet addiction prevalence estimates vary across countries due to differences in diagnostic criteria as well as the psychometric tools utilized in assessment (Kuss, van Rooij, Shorter, Griffiths, & van de Mheen, 2013). A recent systematic literature review has indicated currently 21 different instruments that exist to measure Internet addiction (Kuss, Griffiths, Karila, & Billieux, 2014).

Young's Internet addiction construct appears as one of the earliest conceptualizations and is still adopted nowadays. The ambiguity in a clinical diagnosis of Internet addiction has led to a lack of consensus on a gold standard, making Young's tools more popular as well-known and

* Corresponding author at: Yüzüncü Yıl University, Faculty of Arts, Department of Psychology, P.O. Box. 65080 Campus, Van, Turkey.
E-mail addresses: boysan.murat@gmail.com (M. Boysan), daria.kuss@ntu.ac.uk (D.J. Kuss), yasarbarut@yahoo.com (Y. Barut), nafiaykose@hotmail.com (N. Ayköse), mustafagulec78@yahoo.com (M. Güleç), drosmanozdemir@yahoo.com (O. Özdemir).

http://dx.doi.org/10.1016/j.addbeh.2015.09.002
0306-4603/

frequently utilized in the field. The Internet Addiction Test has been translated into many languages and its psychometric properties have been widely studied. Its internal consistency is reported as high, and ranges from Cronbach's α = .85 (Conti et al., 2012) to α = .93 (Lai et al., 2013). Its temporal reliability is also good, ranging from r = .73 (Lee et al., 2013) to r = .85 (Widyanto & McMurran, 2004), whereas its factorial structure significantly varies across studies. Some researchers report unidimensionality (Hawi, 2013; Khazaal et al., 2008; Panayides & Walker, 2012), and two- (Pawlikowski, Altstotter-Gleich, & Brand, 2013), three- (Lai et al., 2013), four- (Lee et al., 2013), five- (Ng, Saramah, Aili, Subash, & Manveen, 2012), and six- (Widyanto & McMurran, 2004) dimensional solutions. It is worth noting that psychometric investigations of the IAT generally report good reliability and validity for the scale. However, the scale's associations with related psychological constructs have not been studied sufficiently.

Individuals with Internet addiction demonstrate high comorbidity with pathological conditions, such as obsessive–compulsive disorder (Shapira et al., 2003), dissociative pathology (Canan, Ataoglu, Ozcetin, & Icmeli, 2012), and neurotic coping style (Senormanci et al., 2014). Dissociation and obsessive–compulsive disorder are two closely related clinical entities sharing central emotional regulation problems (Boysan, 2014).

Owing to previous literature, the present study had two main aims. First, based on the stress-diathesis model of pathological Internet use and previous findings regarding comorbid conditions, in this study, obsessive–compulsive disorder, dissociative experiences and generic coping styles in response to stressful situations were used to test criterion, construct and divergent validity of the IAT. Second, given the ambiguity in research concerning the factor structure of Internet addiction, in the present study it was aimed to investigate its factor structure through explanatory and confirmatory factor analyses.

2. Methods

2.1. Participants

Overall, 455 college students studying different subjects at the Ondokuz Mayıs University and Yüzüncü Yıl University aged between 18 and 30 participated in the study, of which 47 filled in the IAT and IADQ 15 days later as well. Mean age was 21.89 (SD ± 1.96). Table 1 reports socio-demographic characteristics of the sample.

Following information provision and informed consent declaration, volunteers completed a pen-and-paper questionnaire at the end of their lectures. This research received approval from the Ethical Committee of Ondokuz Mayıs University.

Table 1
Socio-demographic characteristics.

		N	%
Gender	Male	166	36.48
	Female	289	63.52
Income	Low	37	8.13
	Average	396	87.03
	High	22	4.84
Father's education	Illiterate	2	0.44
	Primary school	168	36.92
	Secondary school	67	14.73
	High school	137	30.11
	University	81	17.80
Mother's education	Illiterate	15	3.30
	Primary school	273	60.00
	Secondary school	63	13.85
	High school	73	16.04
	University	31	6.81

2.2. Psychometric instruments

2.2.1. Internet Addiction Diagnostic Questionnaire (IADQ)

The IADQ adapted from pathological gambling is an eight dichotomous item questionnaire designed to assess problematic Internet use (such as item 1, Do you feel preoccupied with the Internet — think about previous online activity or anticipate next online session?). The presence of five or more symptoms has been suggested as indicative of addictive Internet use (Young, 1998b).

2.2.2. Internet Addiction Test (IAT)

The IAT is the expanded version of the IADQ and consists of 20 items rated on a six-point Likert scale, ranging from 0 (does not apply) to 5 (always applies) (Young, 1998a). The IAT includes questions such as "How often do you find that you stay online longer than you intended?" A cut-off value of 50 or higher has been suggested as indicative of problematic Internet use and of 80 or higher as indicative of pathological use (Ngai, 2012; Young, 1998a).

2.2.3. Internet Addiction Scale (IAS)

The IAS developed by Gunuc and Kayri (2010) consists of 35 items rated on a five-point scale, ranging from 0 = never to 4 = very often. The IAS assesses Internet addiction using four symptom clusters: i) withdrawal, ii) control difficulty, iii) functional impairment and iv) social isolation. The instrument has good internal reliability of α = 0.94 and convergent validity.

2.2.4. Coping Inventory for Stressful Situations (CISS)

The CISS is a 48-item self-report questionnaire rated on a 5-point Likert scale to assess three generic coping strategies in stressful situations: task-oriented, emotion-oriented, and avoidance-oriented. The instrument was developed by Endler and Parker (1990) and has been adapted for use in Turkish populations by Boysan (2012), who demonstrated that it has good reliability (Cronbach's αs = .90, .86, and .83, respectively) and validity.

2.2.5. Obsessive Compulsive Inventory—Revised (OCI-R)

The OCI-R is an 18-item questionnaire developed by Foa et al. (2002). Participants rate the degree to which they are distressed by obsessive–compulsive symptoms in the past month on a 5-point scale from 0 (not at all) to 4 (extremely). The psychometric properties of its Turkish version were demonstrated to be good (α = .89). Overall scale scores successfully distinguished the OCD group from depressive outpatients and controls (Aydin et al., 2014).

2.2.6. Dissociative Experiences Scale (DES)

The DES is a valid and reliable measure of dissociative experiences (Carlson & Putnam, 1993). Items are rated on a scale ranging from 0–100. Pathological dissociation with DES scores between 30 and 100 has been associated with severe disturbances in affect regulation (Boysan, 2014). The scale was translated into Turkish by Yargic, Tutkun, and SAR (1995) and had excellent reliability (α = 97) and validity.

2.3. Procedure and statistical analysis

A transcultural adaptation strategy was adopted, in line with the procedures proposed by Hambleton (2005). The relevant literature on the IADQ and IAT was searched and discussed with experts to achieve conceptual equivalence in the Turkish version. Subsequently, the two measures were translated from English to Turkish by four experts in the field. The items were translated into English upon expert consensus.

Initially, descriptive statistics for the data were computed using SPSS. Using LISREL, explanatory (EFA) and confirmatory factor analyses (CFA) were run to investigate the dimensional structure of the IADQ and IAT. The criterion validity of Young's Internet addiction measures was

explored by Pearson correlations with the IAS, OCI-R, CISS, and the DES scores. The sample was separately classified into two groups based on an IAT cut-off score greater than ≥50 (Young, 1998a). One-way ANOVAs were used to compare mean scores of the measures between groups. Internal consistency and test–retest intra-correlations between two applications with 15 days intervals among 47 university students were computed to evaluate the reliability of the IADQ and IAT (Hambleton, 2005). The significance threshold was held at $p < .05$.

3. Results

3.1. EFA analyses

The sample was randomly split into two groups. Using one sub-sample, principal components analyses (PCAs) were run to explore the dimensional structure of the IADQ and IAT and the second sub-sample was subjected to CFA. The Kaiser–Meyer–Olkin measure of sampling adequacy indicated good values of 0.70 for the IADQ and 0.93 for the IAT, respectively. Moreover, item structures of both scales were favorable for explanatory analysis and Bartlett's test of sphericity indicated a chi square value of 314.538, $p < .001$ and 2311.072, $p < .001$, respectively.

Using ViSta 7, the number of factors for the IADQ items was defined through Horn's parallel analysis (Ledesma & Valero-Mora, 2007). Only one observed eigenvalue was higher than the 95th percentile random data eigenvalues. A principal components analysis was performed. The one-factor solution explained 33.14% of the variance. Unrotated factor loadings were higher than .41.

The same statistical procedure was used for the IAT. Horn's parallel analysis indicated a one-factor structure. The unidimensional structure explained 44.94% of the variance in the principal components analysis. All unrotated factor loadings were higher than .50. Findings are presented in Table 2.

3.2. CFA analyses

To validate and test the fit of the derived unidimensional factor structures for the IADQ and the IAT, Satorra–Bentler corrected maximum likelihood CFAs that were carried out. The sample was randomly split into two groups and structural equation modeling was used to test the unidimensional factor structure for the measures relying on the data from the second sub-sample. All CFA goodness-of-fit indices for the one-factor solution of the IADQ and the IAT fell within a good range. All parameter estimates were significant ($p < .01$). Based on the examination of residuals and modification indices, no parameters were misspecified. All items of the IADQ loaded moderately to strongly (.24 to .71) onto the one-factor, with the same being true for the IAT items (.50 to .78). Goodness-of-fit indices for the CFA models are reported in Table 3.

Table 2
Factor loadings for explanatory and confirmatory factor analyses.

	Internet Addiction Diagnostic Questionnaire		Internet Addiction Test	
	φ	λ	φ	λ
Item 1	0.69	0.71	0.57	0.67
Item 2	0.73	0.69	0.68	0.69
Item 3	0.59	0.46	0.50	0.52
Item 4	0.57	0.59	0.66	0.51
Item 5	0.41	0.24	0.74	0.75
Item 6	0.47	0.31	0.74	0.66
Item 7	0.57	0.33	0.52	0.50
Item 8	0.51	0.32	0.70	0.68
Item 9			0.72	0.73
Item 10			0.56	0.64
Item 11			0.75	0.78
Item 12			0.65	0.66
Item 13			0.63	0.51
Item 14			0.68	0.60
Item 15			0.71	0.73
Item 16			0.66	0.76
Item 17			0.72	0.68
Item 18			0.72	0.72
Item 19			0.68	0.65
Item 20			0.75	0.68

φ = factor loadings from principal components analysis; λ = standardized factor loadings from confirmatory factor analysis.

3.3. Descriptives and item statistics

Table 4 presents descriptive statistics for total and subscale scores and item statistics. Good item discrimination index values in terms of corrected item total correlation coefficients for the IADQ and IAT were computed (≥0.24). Specifically, the IAT items revealed excellent item total correlations at >.48. The IADQ had an adequate internal consistency ($\alpha = 0.67$). On the contrary, the internal reliability of the IAT was excellent ($\alpha = 0.93$). Both the IADQ and IAT demonstrated good temporal reliability in terms of intra-correlations ($r = 0.81$, $p < .001$ and $r = 0.87$, $p < .001$, respectively).

According to the IADQ, 52 participants scored five or greater than five (Young, 1998b) and were identified as addicted to using the Internet (11.43%). In contrast, according to the IAT cut-off value of ≥50 (Ngai, 2012; Young, 1998a), 43 participants reported pathological levels of excessive Internet use (9.45%). Although the kappa value was significant and the agreement between participants diagnosed through the IADQ and IAT was moderate ($\kappa = 0.448$, $p < .001$), the correspondence rate was not high (33.8%).

According to the DES, 35 Internet addicts (81.40%) who scored greater than 50 on the IAT had pathological levels (DES ≥ 30) of dissociative experiences (OR = 7.642, 95% CI = 3.46–16.90, $p < .01$).

3.4. Concurrent validity

Respondents with ≥50 IAT scores scored higher on the IADQ and IAS in comparison to respondents who scored lower, and reported higher mean scores on measures of obsessive–compulsive symptoms and dissociative symptomatology than those scoring lower, and were more prone to adhere to emotion-oriented coping in stressful situations, whereas there were no significant differences between the groups on task-oriented and avoidance-oriented coping styles (see Table 5).

3.5. Convergent and divergent validity

Strong correlations between the IADQ and the IAT with total and subscale scores of another Internet addiction measure were suggestive of convergent validity. Generic coping style scores were strongly correlated with the IADQ and IAT, with an exception of weak emotion-oriented coping correlations. Obsessive compulsive symptoms and dissociative experiences were significantly correlated with Young's Internet addiction scale scores (see Table 6).

Table 3
Model-fit results of confirmatory factor analyses for the Internet Addiction Diagnostic Questionnaire and Internet Addiction Test.

	df	S-B χ^2	p	RMSEA	CFI	IFI	SRMR
Internet Addiction Diagnostic Questionnaire	20	44.26	<0.01	0.073	0.93	0.93	0.070
Internet Addiction Test	170	297.72	<0.001	0.058	0.98	0.98	0.051

df = degrees of freedom; S-B χ^2 = Satorra–Bentler scaled χ^2; p = probability value; RMSEA = root mean square of approximation; CFI = comparative fit index; IFI = incremental fit index; SRMR = standardized root mean residuals.

Table 4
Descriptives and item statistics of the measures.

	N	α	Intra r	Rjt	Inter-item r	M	SD	M range (items)	SD range (items)
Internet Addiction									
Diagnostic Questionnaire	455	.67	.81	.24–.49	.03–.56	2.16	1.75	0.10–0.73	0.30–0.49
Internet Addiction Test	453	.93	.87	.48–.74	.22–.61	24.79	16.92	0.82–2.17	1.13–1.44
Internet Addiction Scale	448	.95	–	.41–.71	.04–.75	65.92	22.68	1.43–3.05	0.80–.1.33
Withdrawal	454	.87	–	.45–.66	.22–.57	24.50	8.63	1.81–3.05	0.99–1.33
Control difficulty	450	.87	–	.50–.70	.24–.60	21.25	8.11	1.64–2.53	0.92–1.25
Disorder in functionality	450	.90	–	.66–.75	.44–.75	11.95	5.59	1.52–1.81	0.90–1.11
Social isolation	453	.85	–	.51–.67	.30–.63	10.57	4.55	1.43–1.72	0.80–1.01
Coping Inventory for Stressful Situations									
Task oriented coping	446	.90	–	.42–.67	.21–.61	51.78	12.26	2.71–3.63	1.10–1.33
Emotion oriented coping	451	.85	–	.29–.59	.01–.52	43.21	11.52	2.01–3.41	1.13–1.32
Avoidance oriented coping	443	.84	–	.30–.60	.06–.47	47.00	11.54	2.43–3.44	1.21–1.41
Obsessive Compulsive Inventory—Revised	455	.88	–	.34–.57	.10–.58	27.70	12.43	0.80–2.14	1.10–1.46
Dissociative Experiences Scale	455	.95	–	.36–.71	.03–.72	27.73	16.96	17.44–43.33	22.63–28.78

N = sample size; α = internal consistency; Intra r = 15-day interval test re-test intra-correlations; Rjt = corrected item-total correlations (range); inter-item r = Spearman inter-item correlations (range); M = mean; SD = standard deviation; M range (items) = item means (range); SD range (items) = item standard deviations (range).

4. Discussion

The aim of this study was to investigate the psychometric properties of Turkish translations of the IADQ and the IAT. Using parallel analysis and EFA, the data suggested unidimensional solutions for the IADQ and IAT. The unidimensionality for the IADQ and the IAT was confirmed in subsequent multi-sample CFAs. The factor loadings indicated construct validity of Young's Internet addiction measures. Although the findings of previous IAT factor structure studies have been mixed, the present solution is in line with psychometric studies of Arabic, French and Greek versions of the instrument (Hawi, 2013; Khazaal et al., 2008; Panayides & Walker, 2012).

To date, the concurrent validity of Young's Internet addiction scales has not been addressed. In this preliminary study, it was demonstrated that addicted users reported higher mean scores on the IADQ, IAT and on the total and the subscales of the IAS as well as the OCI-R, DES, and emotion-oriented coping subscale of the CISS in comparison to non-pathological Internet users. In light of these findings, it seems reasonable to suggest that the Turkish version of the IAT satisfactorily distinguishes individuals with problematic Internet use, supporting the measure's sensitivity.

Strong correlation coefficients of the IADQ and IAT with the total and subscale scores of the IAS were predictive of convergent validity. In accordance with Senormanci et al. (2014), Internet overuse was significantly associated with an emotional coping style. The total score on the IAT was inversely linked with a problem-focused coping style. Avoidance-oriented coping was not significantly correlated with Internet addiction. These findings were in line with previous studies (Lee et al., 2013; Pawlikowski et al., 2013; Sung, Shin, & Cho, 2014).

Mild to moderate correlations with obsessive–compulsive symptoms and dissociative experiences were found. Co-occurring psychopathology along with Internet addiction has gradually received more scientific interest. Of note, irrespective of demographic and other Internet related factors, the presence of OCD seems to be the most severe risk factor for problematic Internet use in comparison to other psychiatric symptom dimensions (Jang, Hwang, & Choi, 2008; Yang, 2001). Harm avoidance is central in OCD and is a substantial correlate of Internet addiction symptom severity (Ha et al., 2007). Based on the consistent observations of significant connections between obsessive–compulsive symptoms and the presence of repetitive behaviors in Internet addiction, researchers have suggested that Internet addiction may be considered as another OCD form within the obsessive–compulsive spectrum (Ha et al., 2007; Pratarelli, Browne, & Johnson, 1999).

Connections between obsessive–compulsive symptoms and dissociative experiences were well-established and both clinical entities were strongly tied to problematic Internet use (Bernardi & Pallanti, 2009; Canan et al., 2012). Focusing on the role of dissociation, significant associations between dissociation and Internet addiction may represent a reciprocal relationship. Aardema, O'Connor, Côté, and Taillon (2010) showed that those with initial dissociative tendencies exhibited a

Table 5
One-way ANOVA comparisons of psychological variables.

	IAT ≥ 50						
	Not problematic (n = 412)		Problematic users (n = 43)				
	Mean	SD	Mean	SD	F(1, 453)	*p*	η^2
Internet Addiction Diagnostic Questionnaire	1.90	1.51	4.58	2.01	113.736	<.001	.201
Internet Addiction Test	21.14	12.94	59.79	8.39	367.070	<.001	.448
Internet Addiction Scale	61.86	18.68	104.86	20.71	202.013	<.001	.308
Withdrawal	23.36	7.89	35.42	7.82	91.007	<.001	.167
Control Difficulty	19.83	6.82	34.91	6.67	191.187	<.001	.297
Disorder in Functionality	11.01	4.58	20.91	6.46	166.564	<.001	.269
Social Isolation	9.89	3.81	17.02	5.91	120.503	<.001	.210
Coping Inventory for Stressful Situations							
Task Oriented Coping	52.02	12.37	49.51	11.06	1.635	.202	.004
Emotion Oriented Coping	42.59	11.53	49.09	9.72	12.711	<.001	.027
Avoidance Oriented Coping	46.93	11.70	47.63	10.02	0.142	.706	.000
Obsessive Compulsive Inventory—Revised	26.74	11.93	36.83	13.57	27.084	<.001	.056
Dissociative Experiences Scale	25.75	15.81	46.70	15.97	68.245	<.001	.131

Table 6
Pearson product–moment correlation coefficients of the Internet Addiction Diagnostic Questionnaire and Internet Addiction Test with psychological variables.

	Internet Addiction Diagnostic Questionnaire	Internet Addiction Test
Internet Addiction Diagnostic Questionnaire	–	.67**
Internet Addiction Test	.67**	–
Internet Addiction Scale	.66**	.78**
Withdrawal	.60**	.64**
Control Difficulty	.62**	.76**
Disorder in Functionality	.54**	.69**
Social Isolation	.50**	.62**
Coping Inventory for Stressful Situations		
Task Oriented Coping	−.07	−.13**
Emotion Oriented Coping	.15**	.14**
Avoidance Oriented Coping	.06	.02
Obsessive Compulsive Inventory—Revised	.22**	.33**
Dissociative Experiences Scale	.30**	.41**

** $p < .01$.

greater increase in depersonalization/derealization following virtual reality exposure. Supporting the virtual reality induced dissociation paradigm, previous studies consistently reported significant associations between duration of Internet use and severity of dissociative experiences (Bernardi & Pallanti, 2009; Canan et al., 2012). Our findings were in accordance with previous reports suggesting that problematic Internet use was significantly tied to severe dissociative and obsessive–compulsive symptomatology.

The current study suggests that the IAT has good internal and temporal reliability, but only the test–retest reliability was high for the IADQ, and its internal consistency was one of the highest Cronbach's alphas for the IAT ($\alpha = .93$), and was comparable to that of two studies carried out in Canadian and Chinese samples (Lai et al., 2013; Watters, Keefer, Kloosterman, Summerfeldt, & Parker, 2013). Of the temporal reliability correlation coefficients that have been reported so far, the highest two-week intra-correlation coefficient of $r = .87$ was found in the present study. Results evidence that the Turkish version of the IADQ has an adequate, and the IAT has excellent internal reliability.

The present study has several drawbacks. First, further studies are needed for the diagnostic utility of the Turkish translation of the OCI-R. Second, Young's Internet addiction instruments were not translated back to English. Third, the data included a Turkish sample only. A comparative study with data from other cultures might have provided a more profound knowledge of the utilized scales. Finally, although the lack of cut-off scores and the questionable credibility of the cut-off scores for assessment tools of Internet addiction have been called into question in the literature (Lortie & Guitton, 2013), we used a cut-off score ≥50 rather than a more robust cut-off ≥70 or 80 (Young, 1998a) as an indicator of pathological Internet use because less than one percent of the sample scored ≥70 ($N = 5$).

This study has several implications. The Turkish version of the IAT has sound psychometric properties with high reliability and validity. A Turkish adaptation of the IAT may stimulate further investigations including various aspects of Internet addiction in Turkish samples. There is still ambiguity regarding a clinical definition of Internet addiction. The IAT has been a widely utilized scale, and it allows comparing results with findings from previous studies and other countries.

The present study demonstrates that emotional disturbances, specifically dissociative pathology, are significantly associated with Internet addiction. Risk and preventive factors related to emotional problems in Internet addiction should be assessed in further research. Also, specifically longitudinal designs are needed to (i) understand the symptoms of Internet addiction, (ii) whether they have continuity or discontinuity, and to (iii) differentiate between trait and state psychological characteristics of Internet addiction.

Role of funding sources
None declared.

Contributors
Murat Boysan, Daria J. Kuss, Yaşar Barut, Mustafa Güleç, and Osman Özdemir developed the aims and planned the analyses. Murat Boysan and Daria J. Kuss designed the parent study and refined the aims and analytical strategy. Murat Boysan, Yaşar Barut, Mustafa Güleç and Osman Özdemir conducted the translation. Yaşar Barut collected, and Nafi Ayköse input data into statistical software. Murat Boysan, Daria J. Kuss and Nafi Ayköse conducted the statistical analysis and refined the analytical approach. Murat Boysan and Daria J. Kuss wrote the first draft of the manuscript; all other authors contributed to and have approved the final manuscript.

Conflict of interest
All authors declare that they have no conflicts of interest.

References

Aardema, F., O'Connor, K., Côté, S., & Taillon, A. (2010). Virtual reality induces dissociation and lowers sense of presence in objective reality. *Cyberpsychology, Behavior and Social Networking*, *13*, 429–435.
Aydin, A., Boysan, M., Kalafat, T., Selvi, Y., Beşiroğlu, L., & Kagan, M. (2014). Validation of the Turkish version of the Obsessive–Compulsive Inventory—Revised (OCI-R) in clinical and non-clinical samples. *Archives of Neuropsychiatry*, *51*, 15–22.
Bernardi, S., & Pallanti, S. (2009). Internet addiction: A descriptive clinical study focusing on comorbidities and dissociative symptoms. *Comprehensive Psychiatry*, *50*(6), 510–516.
Boysan, M. (2012). Psychometric properties of the Turkish version of the coping inventory for stressful situations. *Archives of Neuropsychiatry*, *49*, 196–202.
Boysan, M. (2014). Dissociative experiences are associated with obsessive–compulsive symptoms in a non-clinical sample: A latent profile analysis. *Archieves of Neuropsychiatry*, *51*(3), 253–262.
Canan, F., Ataoglu, A., Ozcetin, A., & Icmeli, C. (2012). The association between Internet addiction and dissociation among Turkish college students. *Comprehensive Psychiatry*, *53*(5), 422–426.
Carlson, E. B., & Putnam, F. W. (1993). An update on the Dissociative Experiences Scale. *Dissociation*, *6*, 16–27.
Conti, M. A., Jardim, A. P., Hearst, N., Cordas, T. A., Tavares, H., & de Abreu, C. N. (2012). Evaluation of semantic equivalence and internal consistency of a Portuguese version of the Internet Addiction Test (IAT). *Revista De Psiquiatria Clinica*, *39*(3), 106–110.
Endler, N. S., & Parker, J. D. A. (1990). *Coping Inventory for Stressful Situations (CISS): Manual*. Toronto: Multi-Health Systems.
Foa, E. B., Huppert, J. D., Leiberg, S., Langner, R., Kichic, R., Hajcak, G., et al. (2002). The obsessive–compulsive inventory: Development and validation of a short version. *Psychological Assessment*, *14*, 485–496.
Gunuc, S., & Kayri, M. (2010). The profile of internet dependency in Turkey and development of internet addiction scale: Study of validity and reliability. *Hacettepe University Journal of Education*, *39*, 220–232.
Ha, J. H., Kim, S. Y., Bae, S. C., Bae, S., Kim, H., Sim, M., et al. (2007). Depression and Internet addiction in adolescents. *Psychopathology*, *40*(6), 424–430.
Hambleton, R. K. (2005). Issues, designs, and technical guidelines for adapting tests into multiple languages and cultures. In R. K. Hambleton, P. F. Merenda, & C. D. Spielberger (Eds.), *Adapting Educational and Psychological Tests for Cross-Cultural Assessment* (pp. 3–38). Mahwah: Lawrence Erlbaum Associates.
Hawi, N. S. (2013). Arabic validation of the Internet Addiction Test. *Cyberpsychology, Behavior and Social Networking*, *16*(3), 200–204.
Jang, K. S., Hwang, S. Y., & Choi, J. Y. (2008). Internet addiction and psychiatric symptoms among Korean adolescents. *Journal of School Health*, *78*(3), 165–171.
Khazaal, Y., Billieux, J., Thorens, G., Khan, R., Louati, Y., Scarlatti, E., et al. (2008). French validation of the Internet Addiction Test. *Cyberpsychology & Behavior*, *11*(6), 703–706.
Kuss, D. J., van Rooij, A. J., Shorter, G. W., Griffiths, M. D., & van de Mheen, D. (2013). Internet addiction in adolescents: Prevalence and risk factors. *Computers in Human Behavior*, *29*(5), 1987–1996.
Kuss, D. J., Griffiths, M. D., Karila, L., & Billieux, J. (2014). Internet addiction: A systematic review of epidemiological research for the last decade. *Current Pharmaceutical Design*, *20*(25), 4026–4052.
Lai, C. M., Mak, K. K., Watanabe, H., Ang, R. P., Pang, J. S., & Ho, R. C. M. (2013). Psychometric properties of the Internet Addiction Test in Chinese adolescents. *Journal of Pediatric Psychology*, *38*(7), 794–807.
Ledesma, R. D., & Valero-Mora, P. (2007). Determining the number of factors to retain in EFA: An easy-to-use computer program for carrying out parallel analysis *Practical Assessment. Research and Evaluation*, *12*(2), 1–11.
Lee, K., Lee, H. K., Gyeong, H., Yu, B., Song, Y. M., & Kim, D. (2013). Reliability and validity of the Korean version of the Internet Addiction Test among college students. *Journal of Korean Medical Science*, *28*(5), 763–768.
Lortie, C. L., & Guitton, M. J. (2013). Internet addiction assessment tools: Dimensional structure and methodological status. *Addiction*, *108*(7), 1207–1216.
Ng, C. G., Saramah, M. I., Aili, H. H., Subash, K. P., & Manveen, K. H. S. (2012). Validity of the Malay version of the Internet Addiction Test: A study on a group of medical students in Malaysia. *Asia-Pacific Journal of Public Health*.
Ngai, S. S. (2012). Exploring the validity of the internet addiction test for students in grades 5–9 in Hong Kong. *International Journal of Adolescence and Youth*, *13*(3), 221–237.

Panayides, P., & Walker, M. J. (2012). Evaluation of the psychometric properties of the Internet Addiction Test (IAT) in a sample of Cypriot high school students: The rasch measurement perspective. *Europe's Journal of Psychology*, *8*(3), 327–351.

Pawlikowski, M., Altstotter-Gleich, C., & Brand, M. (2013). Validation and psychometric properties of a short version of Young's Internet Addiction Test. *Computers in Human Behavior*, *29*(3), 1212–1223.

Pratarelli, M. E., Browne, B. L., & Johnson, K. (1999). The bits and bytes of computer Internet addiction: A factor analytic approach. *Behavior Research Methods, Instruments, & Computers*, *31*(2), 305–314.

Senormanci, O., Saracli, O., Atasoy, N., Senormanci, G., Kokturk, F., & Atik, L. (2014). Relationship of Internet addiction with cognitive style, personality, and, depression in university students. *Comprehensive Psychiatry*, *55*(6), 1385–1390.

Shapira, N. A., Lessig, M. C., Goldsmith, T. D., Szabo, S. T., Lazoritz, M., Gold, M. S., et al. (2003). Problematic internet use: Proposed classification and diagnostic criteria. *Depression and Anxiety*, *17*(4), 207–216.

Sung, M., Shin, Y. -M., & Cho, S. -M. (2014). Factor structure of the Internet Addiction Scale and its associations with psychiatric symptoms for Korean adolescents. *Community Mental Health Journal*, *50*, 612–618.

Watters, C. A., Keefer, K. V., Kloosterman, P. H., Summerfeldt, L. J., & Parker, J. D. A. (2013). Examining the structure of the Internet Addiction Test in adolescents: A bifactor approach. *Computers in Human Behavior*, *29*(6), 2294–2302.

Widyanto, L., & McMurran, M. (2004). The psychometric properties of the Internet Addiction Test. *Cyberpsychology & Behavior*, *7*(4), 443–450.

Yang, C. K. (2001). Sociopsychiatric characteristics of adolescents who use computers to excess. *Acta Psychiatrica Scandinavica*, *104*(3), 217–222.

Yargic, L. I., Tutkun, H., & Sar, V. (1995). The reliability and validity of the Turkish version of the Dissociative Experiences Scale. *Dissociation*, *8*, 10–13.

Young, K. S. (1998a). *Caught in the Net.* New York: John Wiley & Sons.

Young, K. S. (1998b). Internet addiction: The emergence of a new clinical disorder. *Cyberpsychology and Behavior*, *3*, 237–244.