



## Vietnamese validation of the short version of Internet Addiction Test



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### ARTICLE INFO

#### Keywords:

Factor analysis

Short-version

Internet Addiction Test

Psychometric properties

Vietnamese

### ABSTRACT

**Background and aims:** The main goal of the present study was to examine the psychometric properties of a Vietnamese version of the short-version of Internet Addiction Test (s-IAT) and to assess the relationship between s-IAT scores and demographics, health related quality of life and perceived stress scores in young Vietnamese.

**Methods:** The Vietnamese version of s-IAT was administered to a sample of 589 participants. Exploratory factor and reliability analyses were performed. Regression analysis was used to identify the associated factors.

**Results:** The two-factor model of Vietnamese version of s-IAT demonstrated good psychometric properties. The internal consistency of Factor 1 (loss of control/time management) was high (Cronbach's alpha = 0.82) and Factor 2 (craving/social problems) was satisfactory (Cronbach's alpha = 0.75). Findings indicated that 20.9% youths were addicted to the Internet. Regression analysis revealed significant associations between Internet addiction and having problems in self-care, lower quality of life and high perceived stress scores.

**Discussion and conclusions:** The Vietnamese version of s-IAT is a valid and reliable instrument to assess IA in Vietnamese population. Due to the high prevalence of IA among Vietnamese youths, IA should be paid attention in future intervention programs. s-IAT can be a useful screening tool for IA to promptly inform and treat the IA among Vietnamese youths.

### 1. Introduction

Internet addiction (IA) is increasingly prevalent among young people worldwide (Lam, Peng, Mai, & Jing, 2009). IA is characterized by the core symptoms of Internet overuse and associated problems such as alcohol abuse, attention deficit and hyperactivity, depression and anxiety (Ho et al., 2014; Mak, Lai, Ko, et al., 2014), leading to negative health related quality of life (B. X. Tran et al., 2017). In 2012–2013, a total of 5366 adolescents aged 12–18 years were recruited from six Asian countries: China, Hong Kong, Japan, South Korea, Malaysia, and the Philippines (Mak, Lai, Watanabe, et al., 2014). The prevalence of IA was highest in the Philippines (21%). In Vietnam, a previous study indicated that 21.2% of young Vietnamese experienced IA (B. X. Tran et al., 2017). In evidence, mental health was an important factor to predict IA, that people experiencing psychological problems had a higher likelihood to suffer IA (Ni, Yan, Chen, & Liu, 2009; B. X. Tran et al., 2017; Wu et al., 2016). Moreover, people were more likely to

suffer from IA if they had online relationships, used Internet for social network or had poor social support (Cao, Sun, Wan, Hao, & Tao, 2011; Chaudhari, Menon, Saldanha, Tewari, & Bhattacharya, 2015; Krishnamurthy & Chetlapalli, 2015). In terms of socio-economic characteristics, male, having low household income, living in private accommodation and living in the city area (Chaudhari et al., 2015; Krishnamurthy & Chetlapalli, 2015; Wu et al., 2016) were associated with detecting IA. Therefore, estimating the prevalence of IA, and identifying factors associated with IA are crucial for clinicians and public health planners to develop tailored interventions to address IA in each population.

To measure IA, Young (1998) developed an Internet Addiction Test (IAT) by using DSM-IV criteria for diagnosing pathological gambling (Young, 1998). IAT mentions several issues related to excessive Internet utilization such as loss of control of using Internet leading to neglecting work and relationships, addictive symptoms (i.e. craving) when being offline etc. (Young, 1998). This tool consists of 20 questions, pertaining

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<http://dx.doi.org/10.1016/j.abrep.2017.07.001>

Received 10 May 2017; Received in revised form 21 June 2017; Accepted 5 July 2017

Available online 08 July 2017

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to problematic behavior regarding Internet use (Young, 1998). It has been published and validated in various languages such as English (Widyanto & McMurran, 2004), French (Khazaal et al., 2008), German (Barke, Nyenhuis, & Kroner-Herwig, 2012), Italian (Ferraro, Caci, D'Amico, & Di Blasi, 2007), Arabic (Hawi, 2013), Chinese (Lai et al., 2013), Korean (Lee et al., 2013), Malay (Lai et al., 2015) and Japanese (Lai et al., 2015). However, the psychometric properties of IAT are still under debate due to the variation in its factorial structures (Pawlikowski, Altstötter-Gleich, & Brand, 2013). Pawlikowski et al. (2013) identified the following problems in the 20-item IAT. First, it contains outdated questions on checking e-mails by computers because e-mails can be checked by other electronic communication methods (Pawlikowski et al., 2013). Second, there were several redundancies across some questions, which potentially led to an overestimation of the IAT score. Furthermore, a shorter version would enhance efficiency of data collection in large epidemiological survey. As a result, Pawlikowski et al. (2013) developed a short version of the IAT (s-IAT), that consists of 12 items and a two-factor model (“loss of control/time management” and “craving/social problems”), which has good psychometric properties. These results were also found in a study of Wery et al. in France (Wery, Burnay, Karila, & Billieux, 2016).

In Vietnam, there were approximately 49 million Internet users in 2016 and the Internet penetration rate was 52%, constituting 1.4% of world Internet users (Stats, 2017). However, these has been limited understanding about a validate and reliable approach to measure IA in Vietnam. A comprehensive scale to assess IA is urgently needed to further advance the development of assessment, treatment and prevention of IA. Therefore, the main objective of the present study was to investigate the psychometric properties of a Vietnamese version of the s-IAT and establish its factor structure using exploratory factor analysis. Moreover, the study also determined the association between IA and potential factors.

## 2. Methods

### 2.1. Participants and recruitment

The study design of this study was described elsewhere (B. X. Tran et al., 2017; Zhang et al., 2017). Briefly, we applied the respondent-driven sampling technique (RDS) to recruit participants. Four eligibility criteria for participants were the following: 1) between 15 and 25 years of age; 2) a resident in Vietnam and ability to understand Vietnamese; 3) agreement to participant in this study, 4) access to email or social media network and agreement to recruit other participants who fulfilled the eligibility criteria to participant in this study.

We designed questionnaire using Google form (available at <https://docs.google.com/forms>). Information about the study purposes, methods and information of investigators were included in Google form. A participant must answer at least 24 out of 40 questions (60%) in the survey in order for the survey to be considered valid and included in the analysis.

### 2.2. Measures and procedure

Demographic information such as age, gender, education, occupation, marital status, ethnicity and religion were collected.

Health-related quality of life (HRQOL) was measured by using EuroQol - five dimensions - five levels (EQ-5D-5L) instrument which comprises of five main domains (Mobility, self-care, usual activities, pain/discomfort and anxiety/depression) with five levels of response: no problems, slight problems, moderate problems, severe problems, and extreme problems. People who answered “No problems” were classified into “No problems” group, while others were classified into “Having problems” group (Bach Xuan Tran, Nguyen, Nong, & Nguyen, 2016; B. X. Tran, Nguyen, Nong, Nguyen, Phan, and Latkin, 2016).

The Short-form Perceived Stress Scale (PSS) was used to measure

stress levels of participants in the last 30 days. This instrument consists of 4 items to be rated on a 5-point Likert scale ranging from 0 (never) to 4 (very often). Total scores range from 0 to 16 and higher scores indicate higher levels of stress (Karam et al., 2012).

We used the s-IAT that was validated by Pawlikowski et al. to assess IA. The s-IAT consists of 12 items to be rated on a 5-point Likert scale ranging from 1 (rarely) to 5 (always). The s-IAT has good psychometric properties and represents the key diagnostic criteria of IA (Pawlikowski et al., 2013). Total score of the s-IAT ranges from 12 to 60 and represents an individual's tendency to or the degree of IA (Pawlikowski et al., 2013). We used the cut-off point of 36 to classify a participant as suffering from IA (Meerkerk, 2007; Zhang et al., 2017). This questionnaire was translated into Vietnamese based on the guidelines of WHO in translation and adaptation of research instrument (WHO). Two experts who are bilingual in English and Vietnamese from medicine and psychology disciplines translated this questionnaire. Based on the WHO guidelines, forward-translation, expert panel discussion and back-translation were performed (organization). The Cronbach's alpha of the Vietnamese version of s-IAT was 0.87. The translation process of this tool was described in the previous study (B. X. Tran et al., 2017).

### 2.3. Statistical analysis

Data were analyzed by using STATA version 12.0. The construct validity of the s-IAT was examined by exploratory factor analysis (EFA). Factors were extracted through Principle component analysis. An eigenvalue of 0.90, which was detected via the scree test, was used to define a threshold. The cut-off point of 0.40 was used for factor loadings. Additionally, a cross-loading in one item was implemented and this item was assigned to the suitable domain based on the content of question and the overarching dimension. The internal consistency of scales and its subscales were assessed by computing the Cronbach's alpha value.

Chi-squared, and *t*-test were used to explore the differences between participants with and without IA. The total score of each subscale was calculated by summing scores of all items of each subscale. Because score of each subscale as well as total score of the whole scale were censored data, multivariate Tobit regression was utilized to identify factors associated with the total score of each subscale. Moreover, a logistic regression was used to identify the factors associated with IA. The potential associated factors included: age, gender, education attainment, current living location, having problems in self-care/usual activities/mobility, suffering pain/discomfort, EQ-5D index and perceived stress score. In this study, we applied a stepwise forward model strategy to select variables for the reduced models (Hosmer & Sturdivant, 2013). A value of 0.2 for *p*-value of log-likelihood ratio test was used to select variables into the final regression models in order to avoid removing significant factors.

### 2.4. Ethics

Proposal of this research was approved by IRB of the Vietnam Authority of HIV/AIDS Control. Participants were asked to give E-informed consent and were informed that they could withdraw at any time. Their contact information was coded and ensured to be confidential.

## 3. Results

### 3.1. Exploratory factor analysis of the 12-item s-IAT

Of the 589 participants, 123 (20.9%) participants with s-IAT score > 36 were classified as cases of IA. The exploratory factor analysis was performed to assess construct validity of 12-item IAT (Table 1). The maximum loading of each item was > 0.40 and the factor analysis explained 64.6% of the total variance. Bartlett's test of

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