

Translation and Validation Study of the Chen Internet Addiction Scale (CIAS) among Malaysian college students

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Abstract

Due to the convenience and availability of internet in universities, internet use has become one of the most common methods of entertainment and studying for college students. However, using the internet excessively leading to internet addiction may result in negative consequences such as decline in academic performance, social isolation, and emotional disturbances. Hence there is a real need to have a validated scale to address this issue. The aims of this study are to translate and validate the Chen Internet Addiction Scale (CIAS) into Malay language (BM).

Two forward and backward translations were done in BM, and its validation was determined by using confirmatory factor analysis. A total of 268 medical students were approached to represent Malaysian adult population for reliability and validity purposes.

Reliability of the Malaysian version of Chen Internet Addiction Scale (CIAS) revealed excellent Cronbach's alpha value of 0.89. Construct validity, evaluated using exploratory factor analysis, had good factor loadings for most of its 26 items except 4. These 4 items had been discussed thoroughly and few suggestions were highlighted.

The Malaysian version of Chen Internet Addiction Scale is correctly and adequately translated to Bahasa Malaysia with high psychometric properties among the tested population. Further studies are needed to verify these preliminary outcomes especially for higher analysis such as confirmatory factor analysis to affirm the validity among Malaysian population.

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Introduction

There is a massive growth of internet use as the internet has become an essential part of our life and due to its multiple purposes, people spend more time online. Owing to the convenience and availability of internet in universities, internet use has become one of the most common methods of entertainment and studying among students. Alongside with its great benefits on various aspects, the disadvantages of internet use should not be overlooked. Griffiths signposted that "excessive

use of the Internet may not be problematic in most cases but the limited case study evidence suggests that for some individuals, excessive Internet use is a real addiction and of genuine concern".¹ Many terms have been coined to describe the pathological maladaptive pattern of heavy Internet use such as "Internet addiction"² "problematic Internet use"³ or "pathological Internet use"⁴. Internet addiction is the most widely used term to describe this maladaptive Internet use.

Internet addiction is characterized by excessive or poorly controlled preoccupations, urges or behaviours regarding internet use that lead to impairment or distress⁵. Using the internet excessively leading to internet addiction may result in negative consequences such as decline in academic performance⁶, social isolation, and emotional disturbances such as depression⁵. Students with pathological internet use who spent significantly longer time on internet had extremely higher level of depression

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than those with no pathological internet use.⁷ Based on that, internet addiction has become an important issue of mental health for college students. Besides, college students have been one of the most mentioned target groups as well as adolescents as online users in previous reports for Internet addiction.³

In Previous studies, self-rated questionnaires have been developed and used to assess the prevalence and severity of internet addiction^{4,8}. One of the important tool used to assess internet addiction is Chen Internet Addiction Scale (CIAC). The CIAS is a four-point, 26-item self-reported scale, it measures internet addiction with good reliability and validity for college students. It assesses five dimensions of Internet-related symptoms and problems, including symptoms of compulsive use, withdrawal, tolerance, and problems in interpersonal relationships and health/time management⁹. The total score of the CIAS ranges from 26–104. Higher CIAS scores indicate increased severity of addiction to Internet activity. Among college students, 63/64 and 67/68 cutoff points of the CIAS were evaluated to be the best screening and diagnostic cutoff points, respectively¹⁰. While for adolescents, the (57/58) and (63/64) cut-off points of the CIAS were reported to be the best screening and diagnostic cut-off points respectively.¹¹ CIAS is a known validated scale for assessing Internet use problems in Chinese populations¹²⁻¹⁵ and previous studies revealed that CIAS is a reliable instrument for identifying the core symptoms and related problems of Internet addiction^{9,10}

Based on the above, the need for assessment of internet addition among Malaysian population is crucial and this can be only implemented if we have a valid and reliable assessing instrument such as CIAS, therefore this study aims to translate the Chen Internet Addiction Scale and to validate it among college students by using construct validity and exploratory factor analysis.

Materials and methods

This is a cross sectional study conducted among university students. Permission was acquired from the original author of CIAS (Sue-Huei Chen) prior to conducting this study. The target number is 250 medical students from

Kulliyah (faculty) of Medicine, International Islamic University Malaysia (IIUM). A research grant sponsored by IIUM was obtained for conducting this research. Ethical approval was obtained from the Research Ethics Committee of IIUM prior to conducting the study. The participation was entirely on voluntary basis. Participants were given the consent form and BM CIAS. The minimum number of subjects for validation of the 26-item Malaysian the Chen Internet Addiction Scale is 260. Informed consent was obtained from the participants after the nature of the procedure was fully explained. The subjects were ensured of the confidentiality of the study.

Translation Procedure of CIAS

The translation process included two forward and two backward translations done in parallel by four bilingual independent translators, which included two medical and two language experts. This method was performed to ensure the translated version is grammatically sound and the terms used are correct. At the same time the meaning and contents of the original Chen Internet Addiction Scale are well preserved.

Inclusion criteria are respondents who are proficient in Bahasa Malaysia and are at least 18 years old.

Questionnaires

1. Demographic questionnaire: age, gender, marital status, family monthly income and accommodation.

2. Finalized BM-CIAS Version.

The reliability and validity tests:

The Data was analyzed using SPSS software version 24. The finalized BM-CIAS was tested for its reliability and validity. Reliability in this study was determined by good Cronbach alpha values, while validity was determined by good factor analysis of all 26 items in the questionnaire (Factor loadings of 0.4 or more were considered good). In this study, we are also looking at the adequacy of sample size which is tested by SPSS software using the Keiser-Meyer-Olkin and Hotelling's T-squared values.

Results

A total of 268 out of 292 (91.8%) medical students who participated and completed the questionnaires were included in the analysis. Participants' socioeconomic information is summarized in table I. The mean age of the

participants is 22.87 year-old. Out of 168 participants, 82 (30.6%) were females, 261 (97.4%) were single, 131 (49.15) have high family income. The majority of the students (159 (96.6) stayed at the hostel and more than half of them spent 20-40 hours per week using the internet.

	No.	%	Total
Age			
22.87 years (SD ± 1.31)			268
Gender			
Male	82	30.6	268
Female	186	69.4	
Year of Study			
Second year	131	48.9	268
Fourth year	137	51.1	
Marital status			
Single	261	97.4	268
Married	6	2.2	
Nationality			
Malaysian	265	98.9	268
Non-Malaysian	3	1.1	
Family income			
< RM 1500	33	12.4	267
RM 1501-5000	103	38.6	
>RM 5000	131	49.1	
Accommodation			
hostel	159	96.6	268
Not in the hostel	9	3.4	
Age of first exposure to internet			
12.3 years (SD ± 2.78)			267
Time of Internet use per week			
> 40 hours	90	33.6	268
20-40 hours	140	52.2	
<20 hours	38	14.2	

Table 1. Socio-demographic data.

Item	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Item 1	57.29	117.597	.412	0.887
Item 2	57.33	117.086	.478	0.886
Item 3	56.53	117.639	.518	0.885
Item 4	56.63	117.516	.438	.887
Item 5	57.38	117.023	.410	.888
Item 6	56.33	118.673	.487	.886
Item 7	57.32	114.415	.576	.884
Item 8	57.40	114.348	.435	.888
Item 9	57.65	115.779	.528	.885
Item 10	57.69	115.267	.557	.884
Item 11	57.29	113.960	.627	.882
Item 12	57.87	118.276	.395	.888
Item 13	57.46	118.509	.316	.890
Item 14	57.61	117.514	.374	.888
Item 15	57.16	119.394	.273	.891
Item 16	57.13	116.309	.479	.886
Item 17	57.78	119.483	.314	.890
Item 18	57.45	116.577	.423	.887
Item 19	57.42	114.466	.597	.883
Item 20	57.52	113.266	.534	.884
Item 21	57.44	116.095	.449	.887
Item 22	57.15	113.458	.621	.882
Item 23	58.08	116.982	.494	.886
Item 24	57.94	115.984	.558	.884
Item 25	58.23	120.270	.299	.890
Item 26	57.79	115.349	.477	.886

Table 2. Corrected item–Total correlations and Cronbach's alpha if item was deleted for the CIAS.

Reliability of Bahasa Malaysia version CIAS

The reliability (internal consistency) of BM CIAS was determined by looking at Cronbach's alpha values. Cronbach's alpha value for overall items was very good .89 (CI 95%) and the respective Cronbach's alpha coefficients for the five domains were .74, .74, .63, .67, and .71 which represent compulsive symptoms, withdrawal symptoms, tolerance, interpersonal & health problems and time management problems respectively. Deletion of any of the items did not increase the internal consistency of the total score 0.89 (table II)

Validity test

The construct validity was evaluated by using confirmatory factor analysis. Factor loadings of 0.4 or more were considered good. Kaiser-Meyer-Olkin value obtained was 0.88 which is statistically significant (p=0.001). Similarly Hotelling's T-squared value measured was 2143.3 with p=0.001. Therefore, these measurements indicate the adequacy of sample size in this study. The analysis without force based on the Varimax rotation revealed there are 6 components. However based on the manual there are actually 5 domains. With forced analysis, we obtained these results; Based on the table III, 4 items namely item 12, 13, 22 and 24 are having low factor loadings (< 0.2) to their respective domain.

Item	Withdrawal	Tolerance	Time management problem	Compulsive behavior	Interpersonal & health problems
Item 1		0.44	0.24		
Item 2	0.58				
Item 3		0.71			
Item 4	0.75				
Item 5	0.27			0.36	
Item 6		0.65			
Item 7		0.49		0.27	0.23
Item 8			0.62		
Item 9		0.33			
Item 10	0.65				
Item 11				0.32	
Item 12				0.74	0.12
Item 13		0.51			0.17
Item 14				0.72	
Item 15					0.37
Item 16	0.76				
Item 17					0.78
Item 18					0.60
Item 19				0.30	
Item 20	0.64			0.31	
Item 21					0.58
Item 22		.49		0.11	
Item 23			0.81		
Item 24		.10	0.66		
Item 25			0.66		
Item 26			0.71		

Table 3. Factor loading of each item in the questionnaire.

The factor loading of item 12 was 0.12 in its respective domain (interpersonal and health problems). This item "Saya mendapati bahawa saya perlu melayari Internet pada waktu sepatutnya saya keluar bersama kawan-kawan saya/ I find myself compelled to use the Internet at the cost of hanging out with friends." was not cross culturally sensitive to assess interpersonal and health problems domain but rather had high factor loading for the compulsive domain (0.74). Item 13 "Selepas melayari laman web, saya berasa sakit-sakit dan belakang badan saya lenguh atau saya mengalami ketidakselesaan fizikal yang lain/ After surfing the Web, I am achy and my back is sore, or I experience other physical discomforts" was found to have a low factor loading of 0.18 on its respective domain (Interpersonal and health problem) while had higher factor loading for the tolerance domain (0.51). Regarding item 22 "Saya cuba untuk mengurangkan masa melayari Internet tetapi saya tidak mampu/ I try to spend less time online, but I can't help it", the factor loading was low (0.11) for its respective domain (compulsive) but it was higher for the tolerance domain (0.49). In assessing item 24 "Saya perlu meluangkan lebih banyak masa melayari Internet untuk mencapai kepuasan yang sama seperti sebelum ini/ I need to spend more and more time on the Internet to achieve same satisfaction as before", the results revealed low loading factors (0.10) for the respective domain (tolerance) while it was higher for the time management domain (0.66).

The factor loading for Item 5 "Saya rasa bertenaga apabila melayari Internet tidak kira betapa penatnya saya/ I feel energized when I'm online, regardless of how tired I am" was found to be 0.27 for its respective domain (withdrawal) which in fact it was higher for the compulsive domain (0.36).

Item 7 "Walaupun penggunaan Internet memberi kesan negatif kepada perhubungan saya, masa yang saya gunakan untuk melayari Internet tidak berubah/ Although using the Internet has had negative effects on my interpersonal relationships, the amount of time I spend online remains the same" had factor loading of 0.23 in its respective domain (interpersonal and health problems) while 0.27 and 0.49 for compulsive and tolerance domains respectively.

Although the factor loading for item 20 "Hidup saya tidak akan bahagia tanpa Internet/

My life would have no joy without the Internet" was acceptable (0.31) for its respective domain (compulsive) but it was higher (0.64) for the withdrawal domain.

Discussion

In this study, the Cronbach's alpha coefficients for the total scale and the subscales of compulsive, withdrawal, tolerance, interpersonal & health problems, and time management problems were 0.89, 0.74, 0.74, 0.63, 0.67, and 0.71 respectively which was slightly low as compared to other studies such as a study done among students in Taiwan in which the internal consistency were found to be 0.94., 0.80, 0.82, 0.75, 0.82, and 0.79¹⁷. In another study conducted by Ramazani among medical students in Iran that the value of Cronbach's alpha for subscales which was between 0.67 and 0.85, and 0.93 for that total scale.¹⁸ while the Cronbach's alpha coefficients of the total scale and the subscales in the original study ranged from 0.79 to 0.93⁹.

Generally most of items in our BM version of CIAS were having good confirmatory factor analysis values except 4 items^{12,13,22,24}. Items 13 and 24 had low factor loading for their respective domains. Although the translation was accurate for these items, but the subjects perceived it wrongly. These two items require to be retested. Item 12 "Saya mendapati bahawa saya perlu melayari Internet pada waktu sepatutnya saya keluar bersama kawan-kawan saya/ I find myself compelled to use the Internet at the cost of hanging out with friends." was found in this study more sensitive to assess compulsive domain by having higher factor loading than its respective interpersonal and health problems domain. We think that this item is more representative for compulsive behaviour than interpersonal and health problem and since compulsive behaviour is integral or core symptoms of addiction and widely been measured on individuals with alcohol dependence¹⁹ and Internet addiction,²⁰ we suggest this item to be included in the compulsive domain. We suggest the same for item 5 "Saya rasa bertenaga apabila melayari Internet tidak kira betapa penatnya saya/ I feel energized when I'm online, regardless of how tired I am" as it is more culturally sensitive to gauge compulsive rather than withdrawal domain.

Regarding item 22 “Saya cuba untuk mengurangkan masa melayari Internet tetapi saya tidak mampu/ I try to spend less time online, but I can’t help it”, we found that the factor loading was low for its respective domain (compulsive) but it was higher for the tolerance domain. When we assessed this item thoroughly, although it is under compulsive domain but we feel that there is some overlap understanding this item as a need to spend more and more time in internet which falls under tolerance domain.

Regarding item 7 “Walaupun penggunaan Internet memberi kesan negatif kepada perhubungan saya, masa yang saya gunakan untuk melayari Internet tidak berubah/ Although using the Internet has had negative effects on my interpersonal relationships, the amount of time I spend online remains the same”, the factor loading were higher in other domains rather than its respective one. We think that there was a difficulty in perceiving this question, although it designated to be under interpersonal problems but it is also can be fall under compulsive behaviour as that compulsive internet use could not be stopped even when the addicted individuals alert about the negative outcomes, this is supported previous study done in Taiwan in assessing the reliability and validity of the Smartphone Addiction Inventory based on CIAS²¹, therefore, we suggest this item to one of the core features of internet addiction and specifically under compulsive domain

Item 20 in this study “Hidup saya tidak akan bahagia tanpa Internet/ My life would have no joy without the Internet” had better factor loadings for withdrawal than compulsive domain which we feel that it will be much better if it’s under withdrawal domain than compulsive one.

The present study is providing a preliminary milestone to the future development of BM CIAS version where some changes may be needed to achieve better results. This BM version of CIAS has been translated with good quality and it is validated for this small group of college students. However to generalize it to Malaysian population, it needs more extensive studies in which we need to include Malaysian adolescents.

Conclusions

The psychometric properties of the Malaysian version of CIAS were reported to be

acceptable in terms of reliability (internal consistency) and validity. The scale is considered as validated and reliable to our population.

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Declaration of Interest

The authors report no conflict of interest.

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