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Reliability and validity of the Persian version of the healthy lifestyle scale for university students

Nayyereh Aminisani[1,2], Seyed Morteza Shamshirgaran[1,3*], Mohammad Asghari Jafarabadi[1,4], Homayoun Sadeghi-Bazargani[1], Aboulghasem Amini[2], Leili Abedi[5], Safieh Kanani[6]

[1]Epidemiology and Statistics Department, Faculty of Health Sciences, Tabriz University of Medical Sciences, Tabriz, Iran
[2]Medical Education Research Centre, Center for Educational Research and Development, Tabriz University of Medical Sciences, Tabriz, Iran
[3]Road Traffic Injury Research Center, Tabriz University of Medical Sciences, Tabriz, Iran
[4]Tabriz Health Services Management Research Center, Tabriz University of Medical Sciences, Tabriz, Iran
[5]Epidemiology and Statistics Department, Faculty of Health Sciences, Kerman University of Medical Sciences, Kerman, Iran
[6]Health Education and Promotion Department, Faculty of Health Sciences, Tabriz University of Medical Sciences, Tabriz, Iran

Abstract

Background: Unhealthy lifestyle behaviors during young adulthood can have negative impacts on health for the rest of a person's life. University students are in a transition stage to adulthood and face considerable changes in their life during their time at university. Therefore, the evaluation of their lifestyle and its changes over time using a valid and reliable tool is very important. This study aimed at assessing reliability and validity of the Persian version of the Healthy Lifestyle Scale for University Students (HLSUS).

Methods: The HLSUS was developed by Wong et al, based on Pender's Health Promotion Model, and was translated into Persian using forward/backward translation methods. Content validity of the scale was assessed by a panel of eleven experts. Moreover, Cronbach α coefficient was calculated to examine internal consistency. The construct validity was assessed via detecting the factor structure of measurements on a sample of 400 students from different faculties of Tabriz University of Medical Sciences. Scale-item correlations and known group analyses were used to evaluate. convergent and discriminant validity

Results: The HLSUS demonstrated good content validity (content validity index [CVI] values 0.80-1.00 and content validity ratio [CVR] values 0.71-1.00), internal consistency ($\alpha = 0.87$) and test–retest reliability (intraclass correlation coefficient [ICC] = 0.89). Based on exploratory factor analysis, it was determined that the eight factor solution was optimal for distinguishing the underlying factors.

Conclusion: The Persian version of the HLSUS demonstrated initial reliability and validity.

Introduction

Over the last decades, lifestyle factors have received considerable attention worldwide because of their important impact on health.[1]

Studies showed that an unhealthy lifestyle has a negative impact on morbidity/multi-morbidity and premature mortality.[2-5] Correlation between sex, age, and socioeconomic factors with healthy lifestyle, health beliefs, and behaviors has been shown.[6,7] Furthermore, health-related quality of life is influenced by a healthy lifestyle.[8]

Lifelong healthy lifestyle choices, such as regular physical activity and a healthy diet, are usually formed during youth.[9] Young people usually start their university life around 18-21 years of age and face remarkable lifestyle modification.[10]

University life, a new social and competitive academic environment that can have both positive and negative impacts on students' health, brings new challenges. Experiencing adverse health behaviors during university years might be a pattern that is continued for the rest of their

Corresponding Author: Seyed Morteza Shamshirgaran, Email: m.shamshirgaran@hotmail.com

life, possibly leading to increased risk of various diseases. In addition, numerous studies reported that unhealthy behaviors such as unhealthy diet, insufficient physical activity, substance use, and smoking, as well as alcohol consumption, are common among university students,[11-14] while other health concerns are also frequently reported, such as poor quality of sleep, anxiety and depression,[15] stress due to academic progress or grades, social pressures, separation from family, and financial concerns.[16-18] Health promotion during university years is very important and is necessary to help young people to adopt a healthy lifestyle in order to decrease the degree of risk in adulthood. Measuring and monitoring of healthy behaviors among university students, who constitute a considerable number of the youth population and are in the transition stage of life towards adulthood using a valid and reliable scale is needed. Recently Wang et al introduced a new scale called the Healthy Lifestyle Scale for University Students (HLSUS).[19] The current study aim at assessing the reliability and validity of the Persian version of the HLSUS in order to use in further research in this setting.

Material and Methods

The current study was a cross-sectional, psychometric survey. This study was conducted in Tabriz University of Medical Science, located in East Azarbaijan province, northwest of Iran, which is ranked as one of Iran's top medical schools.

Data was collected between January and July of 2014. Content validity was assessed by a panel of eleven people from different academic backgrounds, including epidemiologists, biostatisticians, and health education and community health experts. They were selected based on their professional expertise in this field. Reliability and construct validity were examined using data from various university students. Oral consent was received from study participants, who were students from different faculties in Tabriz University of Medical Sciences. Two groups of students participated in this study; a total of 55 students were included in a pilot study in order to examine the reliability of the instrument. Construct validity was examined using data from 400 undergraduate students from different majors.

The HLSUS was developed based on Pender's Health Promotion Model in 2012 by Wang et al, and its validity and reliability have been assessed previously.[19] HLSUS is a self-administered instrument consisting of eight dimensions; exercise behavior, regular behavior, nutrition behavior, health risk behavior, health responsibility, social support, stress management, and life appreciation, 38 items in total. A five-point Likert scale; "never, rarely, sometimes, usually, and always" was used to measure the frequency of reported behaviors, with a rating score ranging from 1 to 5. Items 13, 14, 15, and 16 are scored inversely so that a higher number shows impairment (i.e., $1 = 5 - 4$, $4 = 5 - 1$, and $2 = 5 - 3$, etc.). The total score obtained from the scale indicates the level of healthy lifestyle behaviors. The to-

tal score can vary from 38 to 190. A higher score demonstrates that the subject performs a higher level on the indicated behaviors.

Translation procedure

Permission was received from Dr. Wang in order to use this questionnaire. For the first step, this questionnaire was translated from English into Persian by two independent professionals. Then a backwards translation was done by two different translators, and the final version was also checked by three epidemiologists who were fluent in both languages to check the differences between the Persian version and the original questionnaire.

Content validity procedure

Content validity, the extent to which an instrument reflects a particular content domain of what is being measured, was also assessed. A final version was provided and distributed to a panel of different experts for review of content validity. A panel of eleven people, including epidemiologists, biostatisticians, and health education and community health experts, reviewed the questionnaire and made minor corrections.

The content validity quantitatively was checked using content validity ratio (CVR) and content validity index (CVI). CVR related to the necessity of items and CVI is used to evaluate the simplicity, clarity and relevance of items for the purpose of research.[20]

Students were eligible to include in this study if they were enrolled as undergraduate students and were not temporary or guest students from other universities, and if they were willing to take part in the study.

Data analysis

To assess the internal consistency of the HLSUS, Cronbach alpha was calculated for all 38 items in 55 students who participated in the pilot study, and an alpha equal to or greater than 0.70 was considered satisfactory.[21]

Exploratory factor analysis (EFA) was conducted using data from 400 undergraduate students. Exploratory factor analysis with varimax rotation and principal axis factor in the extraction method were applied to assess the construct validity of HLSUS. Convergent and discriminant validity were evaluated using scale-item correlations and known group analyses. Analyses were performed using SPSS 17 (SPSS Inc./IBM, Chicago, IL, USA) software.

Results

Study participants

In order to check reliability, a total of 55 students from different departments (health sciences, paramedical, and rehabilitation) participated in the pilot study. The mean (standard deviation) age of students was 19.45 (±0.86). Almost 59.3% of them were single and living in a dormitory. The majority were female (76.0%) and the rest were male. In order to conduct factorial (construct) validity, a total of 400 undergraduate students took part from eight depart-

ments and various majors; the mean (standard deviation) age of students as 19.22 (1.29). Almost 58% of these students lived in the dormitory. The majority (68.0%) were female, and only 1.3% of students were married.

Content validity
The content validity of the HLSUS was approved based on both qualitative (comments from panel reviewers) and quantitative results (the level of agreement among expert board members, CVI values, and CVR values). According to the formula, all of items in CVI were within the range of 0.80-1.00, which was statistically acceptable and the CVR calculated for all items was between the0.71-1.00 , which, in comparison with the table of content validity, was acceptable.

Reliability
The reliability coefficient for the overall scale was 0.87. Reliability coefficients were also calculated for the eight subscales. The coefficients for the eight subscales were as follows: regular behavior (8 items, $\alpha = 0.77$), social support (6 items, $\alpha = 0.74$), health responsibility (6 items, $\alpha = 0.68$), exercise and nutritional behavior (6 items, $\alpha = 0.70$), life appreciation (4 items, $\alpha = 0.76$), stress management (4 items, $\alpha = 0.66$), health risk behavior (2 items, $\alpha = 0.76$), and inaccurate habits (2 items, $\alpha = 0.63$). Test-retest reliability (assessed by ICC) was also acceptable (intraclass correlation coefficient—ICC [95% CI] = 0.89 [0.84 to 0.93]).

Construct validity
EFA was conducted using data from the 400 undergraduate students. EFA with varimax rotation extracted eight factors from HLSUS. Based on the analysis of the scree plot, it was determined that an eight factor solution was optimal for distinguishing the underlying factors. These eight factors accounted for 53.3% of the variance. The eight factors consisted of the regular behavior factor (variance explained = 16.67), the health risk behavior factor (variance explained = 8.69), the social support factor (variance explained = 6.30), the health responsibility factor (variance explained = 5.30), the exercise and nutritional behavior factor (variance explained = 4.40), the life appreciation factor (variance explained = 4.27), the stress management factor (variance explained = 3.84), and inaccurate habits factor (variance explained = 3.78).

The Kaiser-Meyer-Olkin (KMO) measure of sampling sufficiency was applied, resulting in a value of 0.805; hence the adequacy of the model was supported; the variables measure common factors when the index value is higher than 0.60. Bartelet's test of sphericity was significant, with $P < 0.001$. Table 1 presents the factor loadings for the 38 items from the HLSUS questionnaire.

Discussion
Adoption of a healthy lifestyle is necessary for young adults in order to decrease the degree of risk in adulthood.

In 2012, Wang et al introduced the HLSUS as a new tool for assessment of healthy lifestyle among university students.[19] They developed and validated this scale and found that a good validity and reliability of the scale. Measuring and monitoring healthy behaviors among university student using a valid and reliable scale is necessary. This study aimed at assessing the reliability and validity of a Persian version of the HLSUS. The results of this study support the validity/ reliability and initial feasibility of an Iranian version of the HLSUS.

Overall, the HLSUS indicated good content validity (CVI values 0.80-1.00 and CVR values 0.71-1.00). It had also acceptable construct validity, which determined that an eight factor solution was optimal for distinguishing the underlying factors. These eight factors accounted for 53.3% of the variance. Our construct validity results was similar to the study of Wang et al study, in which an 8-factor instrument explained 55.02% of the variance across the 38 items. Reliability coefficient for the overall scale was 0.87 in the study of Wang et al. Calculated reliability coefficients for the eight subscales were from 0.63 to 0.77 and test–retest reliability was acceptable (ICC [95% CI] = 0.89 [0.84 to 0.93]).

We could not find any other validation studies using this scale. Other studies related to healthy lifestyle factors among university studies used different scales. One similar scale to the HLSUS is the Health-Promoting Lifestyle Profile II (HPLP-II) developed by Walker et al in 1987 and widely used in different settings.[22] The HPLP-II instrument has 52 health-promoting behaviors with a 4-point response scale (from "never" to "routinely") that is categorized into six health-promoting lifestyle subscales: (1) health responsibility (HR), (2) spiritual growth (SG), (3) physical activity, (4) interpersonal relations, (5) nutrition, and (6) stress management. This scale is for adult populations and is not specific for university students. We found that the HLSUS would be more useful for the purpose of this study because of fewer items (38 versus 52) and because it includes health risk behaviors as well.

All study participants in this study were undergraduate students, which limits the generalizability of our results to higher education levels such as master's or doctoral students, and might not be able to show the effect of some influential factors on lifestyle such as marital status; however, the number of undergraduate university students who participated was considerable and an educational program to enhance healthy lifestyles in the early stages of adulthood is important.

Conclusion
This study found that the Persian version of the HLSUS demonstrated initial reliability and validity and would be a useful tool to assess healthy lifestyles of undergraduate students in a university environment.

Ethical approval
This study received approval from the Institutional Review

Table 1. Exploratory factor loadings for the eight scales of the healthy lifestyle scale for university students

		Factor							
		1	2	3	4	5	6	7	8
Q8	Get enough sleep daily	0.738							
Q7	Keep regular study and resting times	0.711							
Q6	Eat three meals daily at regular intervals	0.697							
Q5	Eat breakfast daily	0.691							
Q29	Take time for relaxation daily	0.504							
Q32	Schedule study and leisure activities	0.442							
Q11	Eat foods rich in dietary fiber (e.g. fruit, vegetables)	0.440							
Q12	Consciously choose a diet low in fat, saturated fat, salt and cholesterol	0.420							
Q26	Talk about my troubles with others		0.753						
Q28	Express my own feelings in a inoffensive manner		0.704						
Q27	Pay attention to others' feelings when handling affairs		0.678						
Q24	Enjoy keeping in touch with relatives		0.607						
Q25	Take part in group activities with classmates		0.583						
Q23	Actively help classmates in trouble		0.453						
Q21	Cover mouth and nose when sneezing or coughing			0.636					
Q22	Keep public environments (e.g. classroom, library, laboratory) clean			0.625					
Q19	Brush teeth or use dental floss after meals			0.599					
Q18	Comply with doctor's advice and treatment			0.512					
Q20	Wash hands before meals			0.500					

Table 1. Continued

Q17	Go to a doctor promptly when any unusual sign or symptom appears	0.464			
Q2	Warm up before vigorous exercise		0.769		
Q1	Exercise vigorously 30 min (excluding warm up) at least 3 times per week		0.761		
Q9	Pay attention to replenishing fluids during exercise		0.647		
Q3	Take part in light–moderate physical activity (brisk walking, bicycling, aerobic dancing, stair climbing) 30–60 min at least 3 times per week		0.520		
Q4	Exercise vigorously within 30 min after meals		0.437		
Q10	Drink at least 800 mL (~5 disposable paper cups) of water daily		0.383		
Q37	Make an effort to feel growth in a positive direction			0.720	
Q36	Make an effort to take interest and be challenged in daily studies and life			0.713	
Q38	Clarify my own learning purpose			0.652	
Q35	Feel content			0.562	
Q34	Accept new experiences and challenges with pleasure			0.429	
Q31	Make an effort to monitor my emotional changes				0.675
Q33	Remain unruffled and respond calmly to frustrations				0.658
Q30	Accept unchangeable things in life				0.579
Q13	Drink alcohol excessively				0.868
Q14	Smoke or consume tobacco or marijuana				0.855
Q15	Listen continuously to headphones for more than 30 min				0.750
Q16	Read or use the computer continuously for more than 1 h				0.713

Extraction method: principal axis factoring; Rotation method: Varimax with Kaiser normalization.

Board and Tabriz University of Medical Sciences' Ethics Committee (Ethics Number TBZMED.1393.5/4/5430). The study has been fully explained to study participants and oral consents were given prior to data collection.

Competing interests
None to be declared.

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