Adaptation of the "Attitudes Toward Physical Activity Scale" for Higher Education Students in Turkey

Sırrı Cem Dinc[1], Fatma Sacli Uzunoz[1], Magdalena Mo Ching Mok[2,3] & Ming-Kai Chin[4,5]

[1] Nevşehir Hacı Bektaş Veli University, School of Sport Sciences and Technology, Nevşehir, Turkey

[2] The Education University of Hong Kong, Department of Psychology and Assessment Research Centre, Hong Kong, China

[3] Graduate Institute of Educational Information and Measurement, National Taichung University of Education, Taichung, Taiwan

[4] The Foundation for Global Community Health (GCH), Las Vegas, Nevada, USA

[5] HOPSports, Inc., Las Vegas, Nevada, USA

Correspondence: Fatma SAÇLI UZUNÖZ, School of Sport Sciences and Technology, Nevsehir Haci Bektas Veli University, 2000 Evler Mah. Damat İbrahim Pasa Kampüsü H Blok. Turkey. E-mail: fatmasacli@gmail.com

Abstract

The purpose of this study was to adapt the "Attitudes toward Physical Activity Scale" (APAS) for Turkish higher education students. Study was conducted during 2018–2019 autumn semester at a public university in the central Anatolia region of Turkey. The APAS was applied to 1021 voluntary university students from eleven different faculties and departments of the university. Descriptive statistics, exploratory and confirmatory factor analyses, internal consistency coefficients were used in statistical analysis. Exploratory factor analysis revealed a six factor solution explaining 60.2% of the variance. Then, confirmatory factor analysis on the 38 items showed good fit to the 6-dimension model according to the goodness-of-fit criteria. The psychometric data of the scale showed that the Turkish version of the scale for higher education students reached the required levels. As a result, the "Attitudes toward Physical Activity Scale" can be used in reliable and valid way at higher education students in Turkey at national or cross-cultural studies in examining physical activity attitudes.

Keywords: physical activity, attitudes, measurement, higher education

1. Introductıon

As in the whole world, in Turkey, inactivity is increasingly prevalent in every period from childhood to old age. According to the press release of Turkish Statistical Institute, the results of Turkey Health Interview Survey showed that the percentage of obese individuals aged 15 and over was 19.9% in Turkey in 2014, it decreased to 19.6% in 2016. When the most recent data of the European Union (EU) was examined in 2014, this rate was 15.4% in the EU. Among the selected EU countries, ranks of Malta was first with 25.2%, Latvia was second with 20.8%, followed by Hungary and Turkey with 20.6% and 19.9%. This shows that one out of five people struggles with obesity in Turkey (TurkStat, 2017). According to the results of Poobalan et al. (2012), 18–25 year olds have low levels of physical activity and consequently are vulnerable to weight gain. Physical activity levels also decreased with age and the time spent on computers/game consoles, whether for work/study or pleasure, increased gradually within this age group. Results also revealed that many did not commence any new sport after moving to university in spite of being active at school.

Regarding this problem, technology is being integrated into the learning environments at universities just like the schools as a necessity of being in the age of new millennium to promote physical activity and movement culture. Because studies showed that implementing short physical activity breaks in classroom can be a way to improve student physical activity behavior in schools (Carlson et al., 2015; Käll, Nilsson, & Lindén, 2014; Turner & Chaloupka, 2017). As Poobalan et al. (2012) mentioned, 18–25 year olds preferred doing physical activity for enjoyment rather than meeting social expectations. Therefore, that might be a starting point to improve positive attitudes towards physical activity and promote healthy living in this age group as well.

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Recently, On-Line-Streaming (OLS) Brain Breaks (BB) videos in classrooms all around the world is being served to make children more active and better learners (Lithuania [Emeljanovas et al., 2018], Poland [Glapa et al., 2018], Malaysia [Kuan et al., 2019], Macedonia [Popeska et al., 2018], Turkey [Sacli Uzunoz et al., 2017]). In the framework of collaborative action research, projects had been conducted using this technology supported programs at national and global levels since 2014 in Turkey as well. Positive results obtained from school kids and related studies in literature mentioned before encouraged the initiation of this applications into the teaching process at higher education. As the first step of a large project, it was necessary to have a reliable and a valid scale measurements that could be used at higher education level as well.

Attitudes toward Physical Activity Scale (APAS) has been using at many countries (Emeljanovas et al., 2018; Glapa et al., 2018; Kuan et al., 2019; Popeska et al., 2018; Sacli Uzunoz et al.) to measure school childrens' attitudes toward physical activity, particularly on personally estimate level of physical fitness, self-efficacy, goal orientation, interest for physical activity, self-awareness for the importance and benefits from physical activity and its contribution in learning for health and holistic development. Mok et al. (2015) revealed psychometric properties of the scale after a rasch analysis based on data from five countries (Lithuania, Poland, Serbia, Singapore and Zimbabwe) at global level. Rasch analysis showed empirical evidence in support of measurement validity and reliability of the APAS for school childrens in classroom settings at various geographical locations globally. Therefore, the purpose of this study was to examine the realibility and validity of the "Attitudes toward Physical Activity Scale" (Mok et al., 2015) for measurements of Turkish higher education students.

2. Method

2.1 Participants

In the current study, APAS was applied to 1021 (40% males n =411, 60% females n =610) voluntary university students at each class level (Mage =20.8 years, SD =2.24 years) from twelve different faculties and departments during 2018-2019 autumn semester at a public university in the central Anatolia region of Turkey. The sampling distribution across faculties and departments is presented below in Table 1.

Table 1. Distribution of participants across faculties and departments

Faculties and Departments	n	%
Nursing	194	19.0
Economics & Administrative	40	3.9
Elementary Education	36	3.5
Physical Education	186	18.2
Foreign Languages	59	5.8
Science and Literature	116	11.4
Theology	107	10.5
Sport Sciences & Technology	70	6.9
Turkish and Social Sciences Education	86	8.4
Tourism	53	5.2
Engineering	24	2.4
Vocational Training	50	4.9
Total	1021	100

The student number with the most weight in sample were nursing, physical education, science and literature, theology, Turkish and social sciences education, respectively. According to class level, the distribution was similar for the freshman, sophomore and junior however, it was the least for senior as it was seen below in Table 2.

Table 2. Distribution of participants across class level

Class Level	n	%
Freshman	340	33.3
Sophomore	251	24.6
Junior	339	33.2
Senior	91	8.9
Total	1021	100

2.2 Instrument and Procedure

The "Attitudes toward Physical Activity Scale" (APAS) (Mok et al., 2015) was used in this study which was designed in English for larger global projects. A total of 58-item APAS is 4-point Likert-type scale ranging from Strongly Disagree, Disagree, Agree, and Strongly Agree. There are seven subscales: Benefits (10 items): Students' perceived benefits of physical activity. An example item is, "Being physically active helps to give me more willpower." Importance (5 items): Students' perceived importance of physical activity. An example item is, "It is important to be physically active for my health." Learning (11 items): Students' learning from the Brain Break® videos. An example item is, "I learned about music through video exercise." Self-efficacy (4 items): Students' self-efficacy in selecting video exercises for themselves. An example item is, "I know how to do physical activity if there is a video exercise to follow." Fun (14 items): Students' interest in doing physical activity. An example item is, "I think physical activity is fun." Fitness (8 items): Students' confidence in their own fitness. An example item is, "I am confident with my balance." Personal Best (5 items): Students' personal best goal orientation when engaging in physical activity. An example item is, "I keep striving for breakthroughs in physical activity." After translation (with back-translation) process of APAS, reliability and validity of the data obtained from school childrens had already been completed by Sacli Uzunoz et al. (2017) in Turkey. Therefore, the translation process was not required again, so validity and reliability analyses were applied directly on the data obtained from university students in the current study.

2.3 Analysis

Once the participants' responses were collected, the data were analyzed using IBM SPSS for Windows (Version 20). In order to examine the reliability of the instrument, the internal consistency (Cronbach's alpha) method was used. Spearman-Brown and the Guttman Split-Half correlation values were also calculated. Lastly, it was decided to undertake exploratory and confirmatory factor analyses in order to evaluate the construct validity of the instrument. Descriptive statistics were also used to show distribution of the participants.

3. Results

To establish an initial factor structure for the Turkish version of the APAS for higher education students, an exploratory factor analysis was conducted using a principal components method. Initially, 58 items of the original questionnaire (Mok et al., 2015) were submitted for analysis. Factor criteria included: (1) items should correlate with the factor with loading >.50; (2) items should not cross-load on the other factors with factor loading > .30; and (3) each factor should be composed of not less than three items. Following a priori criteria, twenty items (a1, a6, a9, b1, b2, b3, b4, b5, c4, c6, c7, d3, e4, e1, e2, e5, e8, e12, e13, e15) were deleted from further analysis for failure to match in these criteria construct validity (Field, 2009; Huang, 2005; Liu,2003; Tsai & Chai, 2005). The items extracted from each sub-scale were given below (see Table 3).

Table 3. Extracted items from the APAS for higher education students

Sub-scales & Extracted items from the scale
Fun
e1: I think physical activity is fun.
e2: I look forward to doing physical activity.
e4: I achieve my physical activity goals even if I am tired.
e5: I persuade my friends to join me in doing physical activity.
e8: I think better after physical activity.
e12: I think my classmates enjoy doing physical activity.
e13: I think other children enjoy doing physical activity.
e15: I think my parents/guardians enjoy physical activity.
Learning
c4: I learned about arithmetic through video exercise.
c6: I learned about writing through video exercise.
c7: I learned about composition through video exercise.
Benefits
a1: Being physically active helps to make me fit.
a6: Being physically active helps to give me new experience every time.
a9: Being physically active helps to improve my sleep.
Self-efficacy
d3: I can follow physical activity in video exercise with minimal mistakes even without a teacher.

Importance
b1: It is important to spend time to be physically active.
b2: It is important to form a habit of being physically active.
b3: It is important to be physically active for my health.
b4: Being physically active is something I would not give up in my life.
b5: Even if I have a lot of work to do, I still keep being physically active.

The procedure was then repeated. The exploratory factor analysis revealed a six factor solution with eigenvalues from 16.27 to 1.37 explaining 60.2% of the variance with 38 items (see Table 4).

Table 4. Factor structure of the APAS from exploratory factor analysis (n =1021)

Sub-scales & Items	Factors					
	1	2	3	4	5	6
Fun						
e3 I enjoy doing physical activity with my classmates	.52					
e6 I feel better after physical activity	.52					
e7 I feel stronger after physical activity	.57					
e9 I think better after physical activity	.57					
e10 I improve on my school work after physical activity	.63					
e11 I think my good friends enjoy doing physical activity	.70					
e14 I think my teachers enjoy doing physical activity	.62					
Learning						
c1 I learned about culture through video exercise		.60				
c2 I learned about music through video exercise		.69				
c3 I learned about art through video exercise		.76				
c5 I learned about language through video exercise		.72				
c8 I learned about healthy lifestyle from video exercise		.56				
c9 I learned about healthy diet from video exercise		.58				
c10 I learned about hygiene from video exercise		.67				
c11 I learned about environmental protection from video exercise		.70				
Benefits						
a2 Being physically active helps to relax me			.80			
a3 Being physically active helps to improve my thinking			.83			
a4 Being physically active helps to improve my analytic skills			.80			
a5 Being physically active helps to enhance my self-concept			.73			
a7 Being physically active helps to give me more willpower			.68			
a8 Being physically active helps to give me good health			.66			
a10 Being physically active helps to improve my school work			.59			
Fitness						
f1 I am confident with my strength				.79		
f2 I am confident with my endurance				.81		
f3 I am confident with my balance				.83		
f4 I am confident with my agility				.87		
f5 I am confident with my flexibility				.80		
f6 I am confident with my rhythm				.78		
f7 I am confident with my hand-eye coordination				.72		
f8 I am confident in doing physical activity elegantly				.58		
Self-efficacy						
d1 I know how to choose physical activity in video exercise that suits me					.68	
d2 I know how to do physical activity if there is a video exercise to follow					.66	
d4 I know which is my favorite physical activity in video exercise					.61	
Personal best						
g1 I try my best to engage in physical activity						.78
g2 My target is to go beyond what I have achieved in physical activity						.85
g3 I keep striving for breakthroughs in physical activity						.79
g4 I just do my personal best in physical activity						.79
g5 I seek to explore my best potential in physical activity						.82
Eigenvalues	16.27	3.69	3.37	2.42	2.17	1.37
Percentage of explained variance	35.5	7.7	5.4	4.9	3.5	3.2
Percentage of total explained variance	35.5	43.2	48.6	53.5	57.0	60.2
Internal consistency (Cronbach's alpha)	.84	.88	.88	.91	.82	.90

Internal consistency (Cronbach's alpha) of each factor ranged from .82 to .91, and it was .94 for the whole scale. Two-Half (Split-Half) test reliability was also calculated the data obtained from 1021 participants by using the Spearman-Brown formula [r Test $=(2r/1+ r)$, where r stands for correlation]. According to the results of the Spearman-Brown correlation value was .88; The Guttman Split-Half correlation value was .88. The obtained internal consistency scores were higher than the original version of the APAS which ranged from .63 to .84 as reported by Mok et al. (2015).

When confirmatory factor analysis was conducted on the 38 items (using AMOS software) the results showed good fit to the 6-dimension model according to the goodness-of-fit criteria, with CFI equal to .95, with TLI equal to .95, RMSEA equal to .04 (90% Confidence Interval), and all standardized path coefficients were in the range of .54 and .86, and statistically significant (x^2/sd values >2.70, where x stands for a path coefficient, and sd is the standard deviation). Details were given at figure1 below.

Given that the APAS scale was designed according to a conceptual framework (Mok et al., 2015) and that previous studies have found evidence in support of the factor structure of the APAS scale as designed, a confirmatory factor analysis undertaken in this study also confirmed the factor structure of the scale for this sample of Turkey university students.
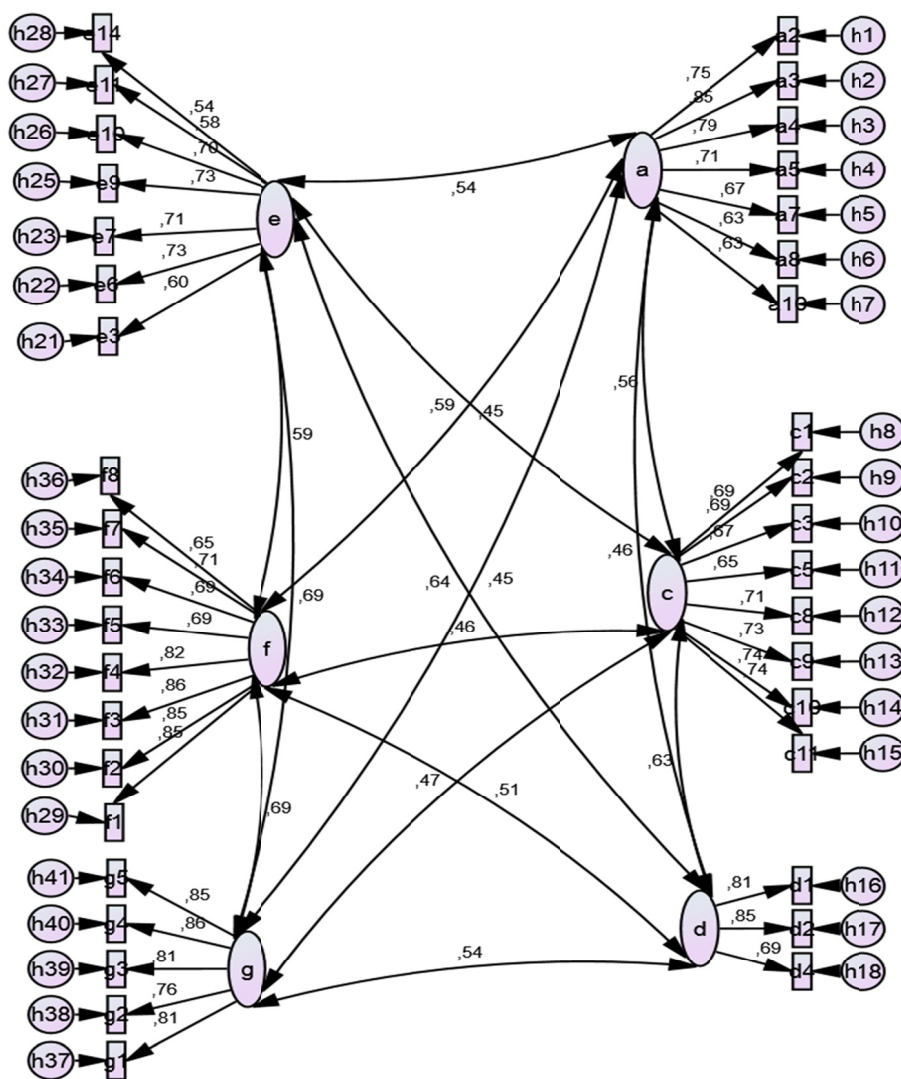

Figure 1. Results of confirmatory factor analysis (a= Benefits, c= Learning, d= Self-efficacy, e= Fun, f= Fitness, g= Personal Best subscales)

As the results of confirmatory factor analysis were examined in detail, model goodness-of-fit was considered adequate when fit statistics Comparative Fit Index (CFI) was ≥.95,Tucker-Lewis Index (TLI) was ≥.95, Root Mean Square Error of Approximation (RMSEA) was <.05, and standardized path coefficients were ≥.50 and statistically significant (x^2/sd values >2.70). These results show that the APAS sub-scales can be considered reliable and valid for use with Turkey university students on the basis of citeria recommended in the literature (Kline, 2016).

4. Discussion

The structure of the scale were examined by comparing with the original APAS scale (Mok et al., 2015) and Turkish version for the school children (Sacli Uzunoz et al., 2017), it would not be wrong to say that there was not a serious change in general. The most remarkable point was the "importance" sub-scale was completely out of the scale, even although it consisted of 5 items in original APAS scale and remained in place with 4 items in the Turkish version for the school children. Other substantial change was the sub-scales of "learning" and "self-efficacy" merged into 15 items in Turkish version for school children appeared as separate sub-scales in this study as in the original scale. The sub-dimension of "learning", which was 11 items on the original scale, was reduced to 8 items, and the sub-scale of "self-efficacy", which was 4 items on the original scale, was reduced to 3 items in the current study. The "fun" sub-scale, which consisted of 14 items on the original scale, was already reduced to 11 items in the Turkish version for school children and now consisted of 7 items for higher education students. The "personel best" sub-scale, which consisted of 5 items on the original scale, was already reduced to 4 items in the Turkish version for school children and now again consisted of 5 items as in the original scale. The "benefits" sub-scale, which consisted of 10 items on the original scale, was already reduced to 9 items in the Turkish version for school children and now consisted of 7 items in the current study. There was no any change in the item number of "fitness" sub-scale, both in the Turkish version for school children and Turkish version for higher education students it remained 8 items as in the original scale.

When examining the psychometric data of the scale, it can be concluded that the Turkish version of the scale for higher education students reached the required levels.

Exploratory and confirmatory factor analyses as well as internal reliability analyses demonstrated satisfactory results regarding the psychometric properties of the APAS for higher education students in Turkey. In this way, the implementation of Brain Breaks® can be examined at higher education level and its effect on students' attitudes being gauged using APAS. These studies can be spread to the whole country, then can also be conducted at cross-cultural level to promote physical activity participation in higher education level.

Taking into account the fact that the only attitudes to predict the physical activity participation is not enough, it can be said that there is still a lot of work to be done in order to obtain sufficient evidence regarding the impact of attitudes as a determinant of physical activity participation.

Acknowledgments

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