

Trans-Cultural Validation of the “Physical Education and Sport Anxiety State Scale” (PESAS) in Arabic Language: Insights for Sport and Physical Education

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Abstract

Objective: Adaptation in Arabic language and empirical examination of the instrument for measuring the state anxiety in physical education and sport PSEAS among Tunisian students. **Methods:** A set of 623 athletic and non-athletic students (m age = 14.71, AND age = 2) from primary and secondary school completed an adapted version of the PSEAS Anxiety Scale in Arabic language. The subjects were recruited in two phases: exploratory (n = 161; m age = 14.59, ET age = 2) and confirmatory (n = 462; m age = 14.79, ET age = 1.99). **Results:** The PSESAS measurement scale was stable on exploratory factor analysis and no items were removed from the three dimensions of the scale. Likewise, reliability tests have shown that the internal consistency is adequate. The confirmatory factor analysis carried out showed the robustness of the measurement of the 18 items of the scale. Also, the three dimensions showed a moderate correlation, which confirms the first-order structure of the instrument. The sensitivity of the instrument for the variable gender, sport practice and gender interaction effect*sport practice was highlighted. Females and non-athletes showed higher levels of anxiety. **Conclusion:** The Arabic version of PSEAS is valid and reliable in terms of psychometrics and can be administered to assess state anxiety rates for primary and secondary students in physical education in Arab countries.

Keywords

Validation, Anxiety, Sport and Physical Education, Teenagers

1. Introduction

Currently, Physical and Sport Education (PSE) is an essential and compulsory school discipline in most countries of the world. This teaching activity plays an essential role in the development of children during the phase of childhood and adolescence in terms of the physical, psychological and social levels (Peralta et al., 2020; Opstoel et al., 2020; Lawson, 2020; Chiva-Bartoll, Salvador-García, & Ruiz-Montero, 2018). In this regard, several studies have shown that participation in Physical Education (PE) in school, high school and university can have an effect on physical practice during adulthood and during professional life (Barkoukis, Chatzisarantis, & Hagger, 2020; Wang & Chen, 2020; Dishman et al., 2005).

In physical education, a student's athletic performance is influenced by several psychological factors such as cognitive occurrence (Hatzigeorgiadis & Biddle, 2000). The authors designed a cognitive occurrence measurement scale for Sport (2000) which was subsequently validated in Arabic (Abbassi, Abbassi, & Naceur, 2021). The flow was introduced in the school setting (Czikszenmihalyi, 1990). An EduFlow scale has been developed (Heutte et al., 2016) and has been validated in Arabic (Abbassi, Abbassi, Fenouillet, & Naceur, 2021).

Anxiety is considered one of the most important factors which has a negative effect in any sport setting (Spielberger, 1972; Martens et al., 1990; Palazzolo, 2020), or in school (Barkoukis et al., 2005).

Besides, in a recent systemic review by McDowell et al. (2019), the random effects meta-analysis proved that self-reported anxiety symptoms and diagnosis of anxiety disorders are lower among adult physical practitioners.

From another perspective, relationships have been highlighted in several studies between PSE and academic performances, representing measures of academic performance, behavior, cognitive skills and attitudes. Thus, regular participation in PSE training sessions is recommended by all research.

PSE as a teaching subject is part of a school assessment system and leads to a grade in the learning curriculum and thus it can present an anxious challenge for students (Barkoukis et al., 2012, Danthony, Mascaret, & Cury, 2019). The state of anxiety of students participating in PSE training sessions may vary, due to threats of self-esteem, with negative evaluations from contemporaries and teachers, and also fear of failure, or the pressure exerted by parents to encourage them to have good grades in all educational subjects (Putwain et al., 2010; Zeidner, 2007). As a result, high rates of anxiety and threats may be encountered by students during PSE sessions and tests (Barkoukis et al., 2012). Precisely, the performance scores for PE exams are immediately available and accessible to students after taking the exams (Barkoukis et al., 2005).

The situational state is then different, compared to other school subjects where exam scores are often private and not immediate. This state can be a source of anxiety that is not present in other learning activities. Anxiety state is defined as an emotional state that presents itself as a temporary reaction caused by a potentially unfamiliar situation, whereas trait anxiety is presented as a feature of the individual's personality (Saviola et al., 2020; Julian, 2011; Spielberger, 1972).

The state of anxiety is viewed as an acute response to a potential threat or as a response in anticipation of a threat that may be triggered by acute stress, and has the primary function of avoiding dangerous situations and also of facilitating memory consolidation (Roozendaal et al., 2009, Barlow, 2013). This state is a heterogeneous emotion and presents a mixture of several negative emotions such as fear of failure, insecurity, flatness, grief, anger, shame, guilt, etc.

In the school context, research has suggested that a high state of anxiety can have negative impacts on the performance and academic success of students (Brook & Willoughby, 2015; Aritzeta et al., 2017; Chin, 2017; Plamondon & Martinussen, 2019; Lisnyj et al., 2020).

In physical education, the state of anxiety can be different compared to other contexts. Indeed, PSE has historically reproduced elements of absolute masculinity through sport-based instructional programs that provide benefits to habitual and stereotypical representations of masculinity (Azzarito & Solomon, 2005; Garret, 2004; Mennesson & Forté, 2018). Likewise, it is characterized, from other activities by the involvement of a set of physical, motor, cognitive, affective and relational skills. Indeed, in learning PE, athletic students with a high level of these skills are highly valued by teachers and may have advantages over other students (Brown, 1999; Emerald, 2016). On the other hand, a lack of capacity can lead to thoughts of doubt, failure or lack of self-confidence which can generally lead to continued feelings of anxiety (Palazzolo & Arnaud, 2013).

Concerning instruments for measuring anxiety state and anxiety treated in different contexts, several anxiety measuring tools have been developed and validated among healthy and pathological populations (Hallit et al., 2020). As an example, recent scales have appeared this year. Lee (2020) validated a measurement tool linked to the COVID-19 pandemic. Likewise, Scahill et al. (2019) validated a parent-rated anxiety scale for youth who has autism spectrum disorder.

In the context of competitive sport, the CSAI-2 and the revised CSAI 2 still remain the most used instruments when evaluating the anxiety state of athletes in terms of scientific work (Marshall & Gibson, 2017; Silva-Rocha et al., 2019; Bagherpour & Hashim, 2018; Agaoglu, 2016).

Several scales are still designed and validated to assess anxiety in the school context. For instance, Carey et al. (2017) and Pizzie & Kraemer (2019) developed two math anxiety self-reports. In another paper, Dressing et al. (2020) validated a scale measuring school anxiety after the concussion.

In sport, Martens et al. (1990) and Cox et al. (2003) developed respectively the two most remarkable specific scales in the field of sport.

The two instruments measuring competitive state anxiety CSAI-2 and the

revised CSAI-2 scale are used in both research and athletic training. They have been used so far as a self-report for anxiety in sport (Marwat & Marwat, 2020; Reigal et al., 2020; Mehrsafar et al., 2020).

Although, physical education in school presents a unique context of anxiety which differs in terms of goals, context and teaching methods from competitive sport and other school fields (e.g.: Biological sciences languages, technical sciences, mathematics, physics, etc.), quite a few tools have been adapted to measure anxiety levels in the context of physical education as a subject of instruction for school-children. As an example, the first measure of anxiety trait in the context of PE was proposed by (Tsorbatzoudis, Barkoukis, & Grouios, 2001) “Physical Education Trait Anxiety Scale” (PETAS) which presents the three dimensions of the cognitive anxiety, somatic anxiety and worry. In another Norton attempt, Norton, Hope, & Weeks (2004) developed the initial “Physical Activity and Sport Anxiety Scale” concept measurement tool. However, PSE and sport were presented as similar contexts.

In addition (Barkoukis et al., 2005) have developed the specific scale in the context of PES “Physical Education State Anxiety Scale” (PESAS) For many years, it was the most recent and credible tool to measure the state of anxiety during the formation of physical education.

The main objective of this research is to translate and adapt cultural PESAS in Arabic language for Tunisian pupils and verify the psychometric properties through two samples exploratory and confirmatory.

2. Methodology

2.1. Participants

A group of 623 pupils belonging to three preparatory schools and three public secondary school have volunteered participate in this research. The pupils, aged between 12 and 18 (A.âge = 14.71, SD âge = 2) who followed two regular courses of PES per week. The study population have been recruited for two phases: exploratory (n = 161; Average âge = 14.59, Standard deviation âge = 2) and confirmatory (n = 462; A. âge = 14.79, Sd âge = 1.99).

During the two stages of the research, the pupils have been made up of athletes and non athletes. The athletes trained for civils sport and practised many sport activities either individual or collective.

The obtained information concerning the characteristics of the population are obtained with a demographic survey. **Table 1** conclude the characteristics of the population during the two phases along with the demographic characteristics of the participants according to the gender and the sportive practice (see **Table 1** below).

2.2. Instrument

Physical Education State Anxiety Scale

An adapted Arabic language version of the PSE State Anxiety Scale was administered for a Tunisian student population at school. The Initial State Anxiety in

Table 1. Distribution of students according to gender and sports practice variables.

Gender	Athletes/Non athletes	Exploratory sample	Confirmatory sample
F	Non athletes	43	172
	Athletes	37	40
M	Non athletes	49	168
	Athletes	32	82
Total	Non athletes	82	340
	Athletes	69	122
	Total	161	462

the Context of PSE (PES) Scale was developed by [Barkoukis et al. \(2005\)](#) to assess state anxiety during physical education classes. The psychometric instrument measures three dimensions of anxiety using 18 items. The first dimension is somatic anxiety (6 items) assessed by feelings of tension and apprehension. The second component of the scale is worry (6 items), which measures negative expectations related to involvement in the activity. Whereas, the third component measures cognitive anxiety and the effects of anxiety mainly related to information processing (6 items), such as attention, memory and problem solving. Responses were received on a 5-point Likert scale (1: Strongly disagree and 5: Strongly agree). The psychometric properties of the scale were satisfactory in terms of structure, reliability, discriminant and convergent validity ([Barkoukis et al., 2005](#); [Barkoukis et al., 2008](#)).

2.3. Procedures

A translation committee was formed by a professional translator, two Arabic language teachers, two French teachers, and two academics in the humanities. The committee translated the 18 items of the initial version of PESAS. Then an expert in Arabic/English translation conducted a reverse translation to check the consistency between the two Arabic and original versions.

The developed version carefully checked whether the meaning of the items was adequate to measure the three dimensions of PESAS by making sure that each item conveyed the meaning that best suited to the meaning of the original version of the measuring tool.

After this step, 07 experienced teachers (more than 10 years of experience) who carry out the teaching activity in primary and secondary establishments evaluated if there were any ambiguities at the item level on a 5-point grid, ranging from 0 (no ambiguity) to 5 (very ambiguous). Members did not offer suggest any modification of the instrument as adapted by the expert group.

Two phases: exploratory and confirmatory were carried out. Therefore, two tests of the developed version of the PESAS anxiety scale were carried out before the start of the practical sessions of physical education and sport, at an interval

of one month, on two different groups of students. The parents of the students, school principals and PSE teachers presented their agreements for the conduct of the survey. The first test on the exploratory sample lasted one week, while the second test on the confirmatory sample was conducted over a period of 3 weeks.

2.4. Ethical Considerations

Participation in the study is voluntary and conforms to the standard ethical recommendations of the 1975 Helsinki Declaration. Also, this research is in accordance with the ethical conventions of the Tunisian university's educational science research protocols and the Tunisian continuing education. Parents of students agreed to have their children participate in this study.

2.5. Statistical Tools

All the statistics were carried out using SPSS version 26 software and Amos version 23 software. The significance level was retained for a p value less than 0.05 for the various statistical tests carried out.

Descriptive statistics were represented by tools and standard deviations for all observed and latent variables of PESAS.

The normality of the items was assessed by examining the two indices of Kurtosis and Skewness.

The factor structure was initially examined in the exploratory phase by performing Principal Component Analysis (PCA) and vari-max rotation with Kaiser's normalization. The Kaiser-Meyer-Olkin measure (KMO) was calculated to assess the adequacy of the sampling. Perfectly, the KMO should be greater than 0.60 (MacCallum et al., 1999).

The control of the possibility of factorization of the correlation matrix was carried out by the Bartlett sphericity test which is a statistical test relating to the whole independence of the components.

After checking the factorial loadings, the elements were removed in the event of unsatisfactory loading (<0.5) according to the recommendations of MacCallum et al. (1999).

Internal consistency is evaluated by Cronbackh's alpha coefficient which must be greater than 0.70 (Cortina, 1993).

The factor structure was also examined by the examinations of the confirmatory factor analysis adjustment indices χ^2 and χ^2/DDL : the χ^2 must be insignificant, but it is very sensitive to the size of the sample, likewise, χ^2/DDL must be less than 3. The relative fit indices GFI and AGFI are reasonable for values greater than 0.90. The TLI and CFI parsimony indices must be greater than 0.95 (Hu & Bentler, 1999). Both SRMR and RMSEA measurement error indices must be less than .060 for good model fit (Hu & Bentler, 1999).

The sensitivity of the instrument was verified by tests of univariate ANOVA for the variables gender, sport practice and gender*sport practice. The partial-squared Eta provided by SPSS was used to calculate the effect size.

3. Results

3.1. Exploratory Study

After visual examination of the data that did not present missing values during this step, we proceeded to calculate the descriptive statistics and the assessments of normality for the obtained scores.

Table 1 shows the tools, standard deviations and normality indices (Skewness and Kurtosis) for the 18 items of the Arabic version of PESAS. The items did not present any abnormality at Skewness (-2 and 2) and Kurtosis (between -1 and 1) (Kim, 2013).

Exploratory Factor Analysis

The 18-item, three-factor PESAS model was examined using principal component analysis with varimax rotation. VARIMAX rotation rotates the axes while preserving their orthogonality. It seeks to maximize the variance of the correlations.

The Kaiser-Meyer-Olkin Index for measuring sampling quality is .90 which is recommended for a value > 0.60 and 0.80 for an excellent value (Costello & Osborne, 2005). While Bartlett's Chi-squared test must be significant is 2295.98 (dof = 153 and $p < 0.001$) which proves that the factorial solution is adequate in the representation of data.

Eigenvalues of 6.60 , 4.26 and 4.47 and 2.70 were enrolled for the three factors. While the fourth eigenvalue is less than 1 (see Costello & Osborne, 2005). The analysis reveals three factors representing 75.33% of the total cumulative variance. The first factor of cognitive anxiety, which consisted of six items, accounted for 25.48% of the variance. The second factor is formed by the somatic anxiety items, which also included 6 items, accounted for 25.13% of the variance. The third one is formed by the items of the worry dimension, represents 24.71% of the total variance. **Figure 1** illustrates the eigenvalue diagram. The inflection point of the curve indicates that only 3 components should be retained (see **Figure 1** below).

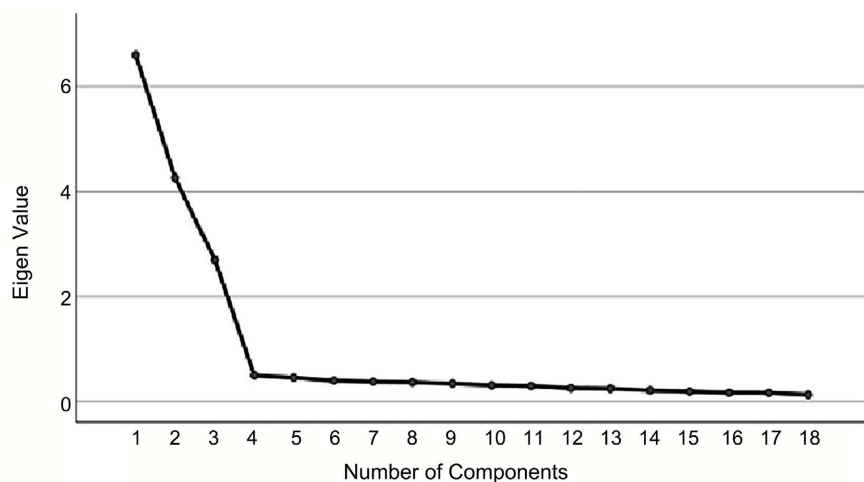


Figure 1. Eigenvalue diagram.

The component matrix which presents the factorial weight of each item after the vari-max rotation is shown in **Table 2**. Following the analysis, the factorial weights are arranged between 0.804 and 0.88 for cognitive anxiety, between 0.845 and 0.853 for somatic anxiety and finally between 0.84 and 0.87 for worry (see **Table 3**). All of these coefficients are adequate and demonstrate the factor stability of the instrument.

3.2. Confirmatory Study

At the start of the analysis a visual examination on the SPSS data sheet was performed to see the missing data. 23 copies of questionnaires with missing values were eliminated. Following this step, we carried out descriptive statistics analysis, normality tests and the internal consistency test.

Table 4 presents the tools, standard deviations, normality indices of Skewness and Kurtosis and internal consistency index for the 18 items of the initial version of PESAS adapted in the Arabic context (see **Table 4**).

The scores obtained on the scale were all greater than 2 and less than 3 and the standard deviations were between 1.09 and 1.21 for the three dimensions of

Table 2. Descriptive statistics and normality for the preliminary 27-item version of PESAS adapted to the context of physical activity (n = 161).

	Mean	Standard deviation	Skewness	Kurtosis
I1	2.70	1.26	0.31	-0.82
I2	2.48	1.19	0.59	-0.55
I3	2.66	1.24	0.33	-0.79
I4	2.68	1.20	0.41	-0.62
I5	2.65	1.28	0.36	-1.00
I6	2.68	1.22	0.40	-0.74
I7	2.65	1.18	0.31	-0.77
I8	2.24	0.98	0.54	-0.17
I9	2.27	1.04	0.62	-0.12
I10	2.28	1.05	0.40	-0.76
I11	2.23	0.96	0.71	0.32
I12	2.29	1.01	0.53	-0.19
I13	2.21	0.94	0.47	-0.43
I14	2.80	1.20	0.15	-0.79
I15	2.68	1.24	0.41	-0.79
I16	2.74	1.23	0.18	-0.81
I17	2.81	1.24	0.27	-0.85
I18	2.73	1.25	0.20	-0.94

Table 3. Matrix of components after a vari-max rotation.

Items	Somatic anxiety	Cognitive anxiety	Worry
I1		0.854	
I2		0.804	
I3		0.843	
I4		0.852	
I5		0.875	
I6		0.847	
I8			0.854
I9			0.870
I10			0.866
I11			0.854
I12			0.840
I13			0.843
I14	0.845		
I15	0.851		
I16	0.853		
I17	0.846		
I18	0.849		

Table 4. Descriptive statistics and normality for the 18-item version of PESAS adapted to the Arabic context (n = 439).

	Mean	Standard deviation	Skewness	Kurtosis	α
I1	2.61	1.18	0.38	-0.71	0.87
I2	2.64	1.15	0.35	-0.65	
I3	2.64	1.13	0.35	-0.57	
I4	2.54	1.11	0.28	-0.67	
I5	2.56	1.11	0.47	-0.42	
I6	2.46	1.08	0.62	-0.09	
I7	2.62	1.20	0.34	-0.82	0.92
I8	2.64	1.21	0.36	-0.76	
I9	2.62	1.14	0.42	-0.63	
I10	2.68	1.20	0.24	-0.82	
I11	2.67	1.14	0.30	-0.67	
I12	2.65	1.11	0.28	-0.64	
I13	2.82	1.16	0.16	-0.71	0.89
I14	2.76	1.11	0.23	-0.62	
I15	2.78	1.08	0.27	-0.50	
I16	2.81	1.17	0.19	-0.78	
I17	2.78	1.09	0.19	-0.66	
I18	2.77	1.15	0.24	-0.64	

the scale. Normality index values did not provide data normality. So, the distribution of scores follows the Gauss distribution.

The Cronbach alpha values are 0.87, 0.92, and 0.87 for cognitive anxiety, somatic anxiety, and worry, respectively. This demonstrates a good internal consistency of the measured three factors.

3.2.1. Scale Sensitivity

The averages of the obtained scores for the three dimensions of the scale were calculated according to the variable gender and sport practice.

The table shows descriptive statistics in terms of tools and standard deviations for cognitive anxiety, somatic anxiety, and worry.

The univariate analysis of variance was carried out to see if the variables of gender and sport practice and their interactions can vary for the three dimensions of the measurement scale.

Table 5 shows that there are significant differences between girls and boys for the dimension of cognitive anxiety ($F [1, 435] = 5.54, p \leq 0.05, \text{Eta}^2 = 0.013$). Indeed, girls are more anxious than boys. A significant effect of sport practice also appears ($F [1, 435] = 26.79, p < 0.001$ and $\text{Eta}^2 = 0.058$). Higher levels of cognitive anxiety are also found among non-athletic participants.

There is a gender interaction effect* sport practice was found with a value of $F [1, 435] = 6.71, (p < 0.01, \text{Eta}^2 = 0.015)$.

Table 6 shows the results of analysis of variance (Univariate Anova) for the dimension of somatic anxiety. The results show that there are no significant differences due to gender. There is no significant effect of playing sport. Finally, no gender* sport practice interaction effect was observed for the somatic anxiety variable.

Table 7 shows the results of the analysis of variance for the worry dimension. The results showed significant differences according to the gender variable, the value of $F = 13.58 (p < 0.001; \text{Eta}^2 = 0.086)$. Concerning sport practice, significant differences were highlighted with a value of $F = 2902.19 (p < 0.001; \text{Eta}^2 = 0.87)$ (see **Table 8**). Athletes have shown very low levels of worry compared to non-athletes.

For the worry dimension, very significant differences were highlighted concerning only the sport practice variable ($F = 89.48, p = 0.000$ and $\text{Eta}^2 = 0.17$).

Table 5. Descriptive statistics according to gender and sport practice variables for Arab PESAS.

Gender	Athletes/Non athletes	N	Cognitive anxiety		Somatic anxiety		Worry	
			Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation
F	Non athletes	166	2.93	0.93	2.79	1.07	3.08	0.92
	Athletes	37	2.19	0.68	2.65	1.31	2.52	0.94
M	Non athletes	159	2.80	0.94	2.76	1.12	2.98	0.95
	Athletes	77	2.46	0.75	2.55	0.93	2.74	0.84

Table 6. Analysis of variance (gender, sport practice and gender*sport practice) for cognitive anxiety.

	Degrees of freedom (df)	F	Signification	Partial eta-squared
Gender	1	5.54	0.019	0.013
Sport practice	1	26.79	0.000	0.058
Gender*sport practice	1	6.71	0.010	0.015
Error	435			
Total	439			

Table 7. Analysis of variance (gender, sport practice and gender*sport practice) for somatic anxiety.

Source	df	F	Signification	Partiel eta-square
Gender	1	2.63	0.105	0.006
Sport practice	1	0.70	0.402	0.002
Gender*sport practice	1	0.09	0.770	0.000
Error	435			
Total	439			

Table 8. Board. Analysis of variance (gender, sport practice and gender*sport practice) concerning worry.

Source	Df	F	Signification	Partiel Eta-square
Gender	3	13.58	0.000	0.086
Sport practice	1	2902.19	0.000	0.870
Gender*Sport practice	1	6.29	0.012	0.014
Error	1	21.71	0.000	0.048
Total	1	0.88	0.348	0.002

3.2.2. Correlation Matrix

The Pearson correlation matrix indicates the presence of a moderate significant positive correlation between cognitive anxiety and somatic anxiety ($r = 0.25$; $p < 0.01$). In addition, very significant positive associations were shown between worry, on the one hand, and cognitive anxiety and somatic anxiety on the other hand. The correlation coefficients were $r = 0.47$ ($p < 0.01$) and $r = 0.30$ respectively (see **Table 9** below). We notice that cognitive anxiety is closely related to worry.

3.2.3. Confirmatory Factor Analysis

Figure 2 describes the different relationships of the model as well as the adjustment measures of the constructs of the Arabic PESAS questionnaire adapted to the context of the activity. The adequacy of the model was tested using a number of adjustment indices. By using models of structural equations for testing, the null hypothesis is established such that a precedent expects the null value will not to be rejected (see **Figure 2**).

Table 9. Pearson’s correlation table between cognitive anxiety, somatic anxiety and worry.

	Cognitive anxiety	Somatic anxiety	Worry
Cognitive anxiety	-----		
Somatic anxiety	0.253**	-----	
Worry	0.472**	0.297**	-----

** The correlation is significant at the .01 bilateral level.

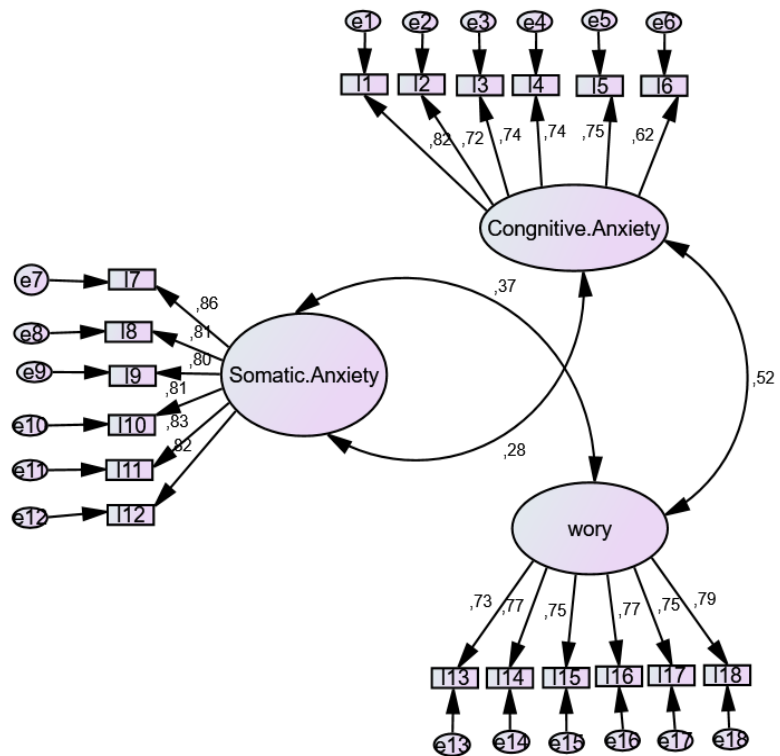


Figure 2. First order confirmatory factor analysis for Arabic PESAS.

First, the loadings’ factors were all good and statistically significant; they are settled from 0.62 to 0.86.

The adjustment-of-fit indices of the confirmatory factor analysis are $\chi^2 (204) = 191.10, p < 0.001, GFI = 0.94, AGFI = 0.92, CFI = 0.98, TLI = 0.97$ and $RMR = 0.048$. These fit indices are within the thresholds recommended by [Hu & Bentler \(1999\)](#) and prove that the model is stable.

For Standardized Root Mean Squared Residual (SRMR), greater than 0.90 is unacceptable, between 0.06 - 0.09 is acceptable, and less than 0.60 is good ([Hu & Bentler, 1999](#)).

Finally, the mean squared residual (RMSEA) shows the proportion of the variance which is not explained by the model. The model has a Root Mean Square Error of Approximation (RMSEA) of 0.044. In general, this value indicates a good adjustment since a value has been less than 0.05 is considered excellent ([Hu & Bentler, 1999](#)).

4. Discussion

The objective of this study was to test the psychometric properties of an adapted Arabic language version of the PESAS scale which assesses student anxiety in the context of PSE. The scale that is designed in Arabic PESAS, which presents the three dimensions of the initial scale, was evaluated on a population of Tunisian male and female students, some of whom practice sport in civilian clubs. A preliminary 18-item version of the instrument was examined by exploratory factor analysis which resulted in item and three-factor validation. Then the adapted model of PSEAS in Arabic was estimated, the GFI indices AGFI, CFI, TLI are all above the recommended value of 0.9, while RMSEA is below 0.08. These results prove the robustness of the factor structure of the instrument. The consistency value for cognitive, somatic, and anxiety per oneself were adequate and greater than 0.80 demonstrating the reliability of the instrument.

The sensitivity of the three dimensions has been proven by its ability to discriminate between practicing sport students and non-practicing students.

The correlation between the dimensions of the instrument showed positive associations between the two types of anxiety (cognitive and somatic) and positive associations of the later with worry. These latest results are in line with the initial work of Barkoukis et al. (2005). Indeed, the three components extracted during the exploratory factor analysis of the initial instrument supported the three-factor structure with a total explained variance of 53.4%. Also, the initial model tested by confirmatory first and second order factor analysis supported a first order model with acceptable fit indices ($X^2/ddl = 2.13$, GFI = 0.90, CFI = 0.92, TLI = 0.91 and RMSEA = 0.064). Regarding internal consistency, the Cronbach alpha indices were acceptable and above the recommended only 0.70.

In contrast, the correlation coefficients between the three PSEAS subscales were lower compared to the initial study by Barkoukis et al. (2005). Indeed, during his study the correlation coefficients of cognitive anxiety with somatic anxiety and worry were $r = 0.52$ ($p < 0.01$) and $r = 0.41$ ($p < 0.01$). Additionally, the correlation between somatic anxiety and worry was $r = 0.41$ ($p < 0.01$).

Our results are in line with the work of the self-report anxiety symptoms condition in the Portuguese population. Indeed, the Transcultural Cultural Adaptation of the Scale (PESAS) in Portuguese, among pupils aged from 13 to 21 presented the same factor structure of the initial instrument. The structure with 18 items and 3 factors (somatic anxiety, cognitive processes and worry) was validated. Also our results are in line with the Portuguese study in terms of the comparison of anxiety levels by gender. Female students displayed higher levels in all three dimensions of anxiety compared to male students. Likewise, students who engaged in extracurricular physical activity revealed lower levels of cognitive processes and worries/fears. Age is negatively correlated with cognitive processes and somatic anxiety, which means that the older ones demonstrated higher levels of anxiety.

Previous evidence in other studies has shown that anxiety levels can differ

between male and female. Indeed, previous research has indicated that girls are more anxious than boys (Borges-Santos et al., 2015; De Matos et al., 2003; Mayer et al. 2016). This has been attributed to the greater social approval which demanded by girls and the greater resistance of boys to admit feelings of anxiety (Batista & Oliveira, 2005).

In another study by Yli-Piipari et al. (2009), associations between anxiety levels measured on the PESAS scale with student's motivation. The results showed that a high level of intrinsic and extrinsic motivation are linked to low then to moderate levels of anxiety in physical performance in school-going children (Pérès et al., 2002). Her study also highlighted that students who were less physically active and had less enjoyment in physical education had lower state anxiety levels on the PESAS scale.

As for concerning the practice of sport outside school, Prapavessis et al. (1992) found that a higher sport experience was associated with lower cognitive and somatic anxiety, due to greater autonomy. These results may, however, imply that teenagers participating in competitive sport may report lower anxiety levels in another less competitive and demanding setting, such as physical education. However, as researches on anxiety in physical education are scarce, there is little evidence of levels of state anxiety related to the PSE setting which concern to gender, age, and participation to physical activity outside of school have been demonstrated.

From another perspective, examining anxiety in an academic context is quite difficult since each student has different symptoms. For example, Shukla (2013) grouped manifestations of anxiety state into four groups: 1) Physical-nausea or diarrhea, extreme changes in body temperature, dry mouth, headache, sweating, fast heartbeat, shortness of breath, dizziness; 2) Emotional-feeling helpless, anger, excessive feelings of fear, uncontrollable crying, disappointment, depression; 3) Behavioral-drug addiction, agitation, avoidance, rhythm; 4) Cognitive-negative thinking, difficulty in organizing thought, negative self-talk, accelerated thoughts, comparing oneself to others, "going blank", difficulty in self focus, and feelings of dread.

5. Conclusion and Limitations of the Study

On the whole, this study showed that the Arabic version of the anxiety in the Context of Physical Activity Questionnaire presented items that are understandable by a population of Arab Tunisian children and teenagers.

The statistical study showed the robustness of the factor structure of the instrument. The consistency value for cognitive, somatic and self-anxiety aspects demonstrated the reliability of the instrument.

The instrument has shown good psychometric properties that can be used to assess anxiety-related to physical activity in academic research and in school settings. It is important to have an instrument to assess high levels of anxiety detrimental to learning and engagement in this subject. The scale adapted from PESAS

can be used to measure anxiety in the Arab world.

However, limitations are presented in this work. We need to enlarge the population and see the stability of the structure in other Arab countries. In addition, a further examination in terms of concurrent validity of the instrument should be carried out in the future.

Authors' Contributiona

A: Study Design, B: Data Collection, C: Statistical Analysis, D: Manuscript Preparation, E: Funds Collection.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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Annex

I. القلق الجسدي	I. Somatic anxiety
2. أشعر وكأنني أعاني من ضيق في التنفس	2. I feel as though I am short of breath.
5. أشعر بعدم الراحة عندما أتنفس	5. I feel discomfort when I breathe.
8. أشعر بالدوار	8. I feel dizzy.
11. أشعر بضغط على صدري	11. I sense a feeling of pressure on my chest.
14. جسدي يؤلمني	14. My body is aching.
17. أشعر كما لو أن شيئاً ما يخنقني	17. I feel as if something is choking me
II. القلق-	II. Worry
3. أنا قلق من ارتكاب أخطاء أثناء تنفيذ المهمة	3. I am concerned about making errors during task execution.
6. عند القيام بالمهام ، أشعر بعدم الارتياح تجاه الأخطاء المحتملة.	6. When performing the tasks, I feel uneasy about potential mistakes.
9. أنا قلق للغاية بشأن الاختبارات الجسدية.	9. I worry a lot about the physical tests.
12. أشعر بالقلق إزاء نتائج الفشل عند أداء المهام	12. I am concerned about the results of failure when performing the tasks.
15. أفكر في عواقب الأخطاء المحتملة في الاختبار	15. I think about the consequences of possible mistakes in the test.
18. أخشى أن أؤدي بشكل سيء	18. I worry that I will perform badly.
III. العمليات المعرفية	III. Cognitive processes
1. أجد صعوبة في الاحتفاظ بالمعلومات في ذاكرتي فيما يتعلق بالمهام المعروضة	1. I find it difficult to retain information in my memory regarding the tasks presented.
4. أجد صعوبة في التركيز على مهمة التربية البدنية المقدمة	4. I find it difficult to focus on the PE task presented.
7. أجد صعوبة في حفظ المعلومات المتعلقة بالمهام المعروضة.	7. I find it difficult to memorize information regarding the tasks presented.
10. أجد صعوبة في تذكر مهام التربية البدنية التي اعرفها	10. I find it difficult to remember PE tasks I already know.
13. افكاري لم تكتمل	13. My thoughts are not completed.
16. أجد صعوبة في فهم نمط مثل هذه المهام المعقدة	16. I have difficulty in understanding the pattern of such complex tasks.