



Research Paper:

Translation, Cross-cultural Adaptation, and Study of the Validity and Reliability of the Persian Version of Sport Concussion Assessment Tool 5 (SCAT5)



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Article info:

Received: 19 Sep 2021

Accepted: 22 Dec 2021

Available Online: 30 Dec 2021

Funding

The paper was extracted from the MSc. thesis of the first author, Department of physiotherapy, Faculty of rehabilitation science, Iran University of medical science, Tehran.

Conflict of interest

The authors declared no conflict of interest.

ABSTRACT

Background and Objectives: This study was done to translate and evaluate the validity and reliability of the Persian version of the Sport Concussion Assessment Tool 5 (SCAT5) among Iranian martial arts athletes.

Methods: Translation and adaptation were performed in several stages with the instructions provided by Beaton et al. A total of 86 Persian-speaking martial arts athletes (42 males and 44 females) participated in this study. Descriptive statistics were reported for all items of SCAT5. For determining construct validity, the correlations between items of the Persian version of the SCAT5 and the Beck Depression Inventory (BDI) were all reviewed. The reliability of the questionnaire was determined from two different aspects of test-retest reliability and internal consistency.

Results: The processes of translation and cultural adaptation were done by maintaining cultural adaptation through replacing appropriate words and terms, and finding semantic and perceptual equivalents. There was a significant difference between the results of male and female participants. For components of the SCAT5 in comparison with BDI, Spearman rank-order correlation coefficient (ρ) was moderate with the Persian version of BDI 0.57 ($P < 0.001$) in terms of the number of symptoms and severity of symptoms 0.50 ($P < 0.001$). Regarding the test-retest reliability, the Persian version of the SCAT5 questionnaire showed excellent reliability for all items ($ICC > 0.75$) and moderate reliability for the number of symptoms ($ICC = 0.48$) and severity of symptoms ($ICC = 0.49$). The coefficient of Cronbach's alpha was more than 0.70 for all items of the Persian version of the SCAT5.

Conclusion: The Persian version of the SCAT5 is a valid and moderate reliable instrument for medical professionals and health care providers in concussion assessment. The ceiling effect was observed in three components, including orientation and two parts of concentration (backward recalling of digits+recalling of months in reverse order).

Keywords: Cross-cultural Adaptation, Translation, Validity, Reliability, Concussion, Martial Arts



Cite this article as Imani Pahlavanloo Z, Yassin M, Salehi R, Mazaherinezhad A, Mansour Sohani S. Translation, Cross-cultural Adaptation, and Study of the Validity and Reliability of the Persian Version of Sport Concussion Assessment Tool 5 (SCAT5) Function and Disability Journal. 2021; 4:E43. <http://dx.doi.org/10.32598/fdj.4.43>

<http://dx.doi.org/10.32598/fdj.4.43>

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↑ *What is “already known” in this topic:*

- *The Persian version of the SCAT5 is a valid and highly reliable instrument.*
- *The Persian version of the SCAT5 is beneficial and effective for the assessment of Persian-speaking athletes.*
- *Using the 10-word list option in the memory section of the SCAT5, ceiling effects of using a 5-word list were eliminated.*

→ *What this article adds:*

- *Martial arts are one of the most popular sports among Iranian men and women.*
- *The Persian version of SCAT5 created in this study can be used at sidelines assessment and evaluating suspected concussions in Persian-speaking athletes.*
- *It can be the basis to compare studies performed on Persian athletes with research conducted in other languages.*

Introduction

A Concussion is one of the most common injuries in athletes participating in contact and collision sports, and also is one of the most complex injuries to be diagnosed, assessed, and managed in sports medicine [1, 2]. Due to the extent and variety of symptoms in concussion, the Sport Concussion Assessment Tool (SCAT) was designed to standardize medical assessment and create a framework for the diagnosis of concussion [2, 3]. It has been corrected over the years with inputs from proficient panels, systematic reviews, and conference participants [4].

In 2017, the Concussion in Sport Group (CISG) released the Sport Concussion Assessment Tool 5 (SCAT5) as the newest version of SCAT from the 5th international consensus [5]. SCAT5 is a tool for evaluation of athletes at 13 years of age or older and only is used by healthcare professionals that include two main parts: immediate (on-field) and out-of-field (off-field) assessments. The on-field assessment includes investigating for red flags and observable signs, memory assessment (using the Maddocks questions), the Glasgow Coma Scale (GCS), and a cervical spine assessment. The out-of-field assessment concentrates on athletes' background, symptom evaluation (athlete should complete it), cognitive screening with the Standardized Assessment of Concussion (SAC) test (orientation, memory, and concentration), neurological screening containing a balance examination with the

Modified Balance Error Scoring System (m-BESS), and delayed recall, and terminally, it involves healthcare provider's description and recognition.

The SCAT5 was designed in English, limiting its use in other languages and cultures. To the best of our knowledge, recently, there have been no standardized and cross-culturally adapted concussion assessment tools for Persian-speaking athletes.

Martial arts are one of the most popular sports among Iranian men and women, which have been very famous during the last 10-15 years [6]. Due to the nature of collisions in martial arts, there is a high prevalence of injuries in various parts of the body, including the head. Injuries to the head, neck, and torso account for a large proportion of whole body injuries in martial arts [6, 7]. Therefore, there is a need for a valid and reliable adaptation of the SCAT5 in Persian to be used by a medical professional for evaluation of Persian-speaking athletes experiencing concussion leading them to make suitable clinical decisions. This study was conducted for translation and cross-cultural adaptation of SCAT5 into a standardized Persian version (Persian-SCAT5) and studying the validity and reliability of Persian SCAT5 in Iranian athletes.

Materials and Methods

The present psychometric study was performed in Iran and approved by the Ethics Committee of the Iran University of Medical Sciences with the ethics code of

IR.IUMS.REC.1399.1413. Processes of translation and validation started from March 2019 and continued to April 2021. Due to the outbreak of the COVID-19 pandemic, the process lasted for a long time.

The informed consent form was obtained from all the participants in the project. Also, the necessary correspondence was done to obtain written permission from the CISG.

Translation and cross-cultural adaptation process

The processes of translation and adaptation were based on principles of translation in the medical literature [8] and consisted of the following stages:

Initial (forward) translation

The primary translation of the SCAT5 and its instruction was done to Persian by two bilingual people whose native primary language was Persian. This process was done with special attention to cross-cultural adaptation.

Appraisal by the expert panel

Two experienced and professional physical therapists with a Master's degree in physical therapy began revision and control of words and sentences of primary translation one by one and matched them culturally. They assessed the quality of the Persian translation in terms of clarity, common language use, conceptual equivalence, and acceptability. Also, during this work, they consulted with neurologists and sports medicine specialists.

Backward translation and appraisal by the expert panel

In this stage, a bilingual native Persian-speaking person was asked to perform backward translation, as the first common translation from Persian to English. The translator did not have a medical background and was blind to the content of the original English version of the SCAT5.

Testing of pre-final version

In this section, the following measures were done: Comparison of backward-translated form with the original version of the SCAT5 and performing pilot testing of the Persian version in a group of 13 participants with an acute head injury and giving feedback and reporting about clarity, intelligibility, and lack of misconceptions, consistency and its semantic and idiomatic features of the Persian SCAT5.

Finalization

Considering all the comments, the final version of the Persian SCAT5 was developed.

Participants

Totally, 86 Persian-speaking participants who were at least 14 years old and had participated in national kickboxing competitions or the Iranian Taekwondo Premier League were selected using a simple and non-random sampling method. These participants at least had a basic level of literacy, mechanism of injury (direct blow to head, face, or neck), and also had been concussed in the past 1-5 days, followed by having at least 4 of the symptoms listed in the symptom evaluation table of the SCAT5. If participants had any of the items listed in red flags (refers to the red flag box of the SCAT5), they were excluded immediately from the study and transferred to the nearest hospital.

The Persian version of SCAT5 and the Persian version of the Beck Depression Inventory (BDI) were completed by all the participants based on instructions by licensed healthcare professionals. For evaluation of the reliability, 50 concussed participants were re-evaluated seven days after the injury. For ensuring that the participants' symptoms and general condition do not change, the sample population included participants who not only had not changed significantly during the two evaluation stages but also had not suffered from a recurrent head injury. This lack of change was confirmed by asking the patient and treating physician.

Statistical analysis

Data were analyzed using descriptive and inferential statistics. Descriptive statistics included Mean \pm SD, lower and upper scores for all components of the Persian SCAT5. Kolmogorov-Smirnov test was first employed to determine normality for each component ($P < 0.05$). After performing this test, it was found that approximately half of the data had a normal distribution ($P \geq 0.05$). These components were the number of symptoms, the severity of symptoms, immediate memory (10-word list), SAC, and m-BESS. Other components were not normally distributed ($P \leq 0.05$). Therefore, for sex comparison, items with normal distribution were tested using Independent-Samples t-test; and items with abnormal distribution were tested by Mann-Whitney U test.

Construct validity

For evaluation of construct validity, the spearman's correlation was used between sub-scales of the Persian version of SCAT5 and the total score of the BDI with a 95% confidence interval. The BDI is one of the most popular and common self-report tools for screening for depression in people over 13 years of age, which includes 21 groups of questions. Numerous studies have reviewed and confirmed the validity, reliability, factor analysis as well as cut-off point of this questionnaire [9].

In this research, "r" values of 0 - 0.19, 0.20 - 0.39, 0.4 - 0.49, 0.7 - 0.89, and 0.9 - 1 showed very poor, poor, moderate, strong, and very strong results, respectively [10].

Reliability

For measuring the reliability of the sub-scales of the Persian version of the SCAT5 questionnaire, the test-retest, intraclass correlation (ICC) coefficient, and coefficient with 95% confidence interval (CI) were computed. The calculation was based on a 2-way random analysis of variance (ANOVA). The ICC value was interpreted as follows: weak reliability for values less than 0.4, moderate to good reliability for values between 0.4 - 0.74, and a value greater than 0.75 showed excellent reliability [10]. For measuring the internal consistency of sub-scales of the Persian SCAT5 questionnaire, Cronbach's alpha coefficient was calculated with a 95% of CI. The acceptable value for Cronbach's alpha coefficient was more than 0.70 [10]. A p-value of <0.05 was considered statistically significant. The power of reliability in this study was between 0.85 and 0.97 and the type of ICC

was ICC1, 2. All the statistical tests were administrated using SPSS software, v. 21.

Results

Participants

Among 86 concussed participants, 44 women with a Mean±SD age of 18.68±4.34 years old and 42 men with a Mean±SD of 18.88±3.36 years old completed the Persian SCAT5. There was no significant difference between male and female participants in terms of age ($t=-0.23$, $P>0.81$) and body mass index (BMI) ($t=-0.82$, $P>0.41$).

Translation and adaptation

For providing cross-cultural adaptation, there were distinctions between backward -translated form and the original version of the SCAT5. For instance, two of the words used in the immediate memory table were replaced.

The word "penny" has a different meaning and there is no common word in Persian for it; thus, it was replaced with "Rial" in the Persian version. Also, the word "dollar" due to lack of common use in Persian was replaced with "Toman", which is a currency in Persian.

Components of Persian version of the SCAT5

Table 1 shows items of Persian SCAT5, including the number of symptoms, the severity of symptoms, immediate memory (10-word list), m-BESS, and delayed recall (10- word list). Mean (SD) and minimum and maximum scores of each item were also mentioned.

Table 1. Persian Sport Concussion Assessment Tool 5 (SCAT5) items

Items	Mean±SD	Min-Max
Number of symptoms	9.44±3.92	4-20
Severity of symptoms	23.75±16.03	5-81
Orientation	4.97±0.15	4-5
Immediate memory (10-word list)	22.50±3.45	11-28
Concentration (digits backward)	3.32±0.67	2-4
Concentration (months in reverse order)	0.96±0.18	0-1
Concentration total score (digits months)	4.29±0.71	2-5
Standardized assessment of concussion (SAC)	38.44±4.54	25-46
mBSS Total Errors	5.34±5.36	0-30
Delay recall 10 words	6.67±0.97	4-9
Beck Depression Inventory (BDI) score	7.80±7.01	0-44

Table 2. Persian Sport Concussion Assessment Tool 5 (SCAT5) results by sex: t-test for parametric component

Items	Mean±SD		t	Sig.	Mean Dif-ference	95% Confidence Interval	
	Men	Women				Lower	Upper
Number of symptoms	7.90±2.81	10.90±4.28	3.822	0.001*	3.004	1.44	4.56
Severity of symptoms	18.35±9.41	28.90±19.17	3.21	0.002*	10.55	4.02	17.07
Standardized assessment of concussion (SAC)	40.09±3.39	36.86±4.95	-3.509	0.001*	-3.23	-5.06	-1.40
Immediate memory (10-word list)	23.80±2.41	21.25±3.85	-3.673	0.001*	-2.55	-3.94	-1.17
mBSS Total Errors	3.21±2.77	7.38±6.39	3.89	0.001*	4.17	2.04	6.30

Significance level $P < 0.005$.

Concussed participants reported on average 9.44(3.92) symptoms with symptom severity of 23.75(16.03). The most commonly reported symptoms were headache ($n=72$, 83.70%), fatigue/low energy levels ($n=70$, 81.33 %) and feeling of slow down ($n=53$, 61.62%).

Concussed participants also reported a total SAC score of 38.44(4.54) from 50. One sub-component of SAC was the orientation with an average value of 4.97(0.15) and 97.7% ($n=84$) of participants recorded the maximum score.

Immediate memory (10-word list) was measured with an average value of 22.50(3.45) from 30. None of the participants was able to correctly repeat all 30 words for the immediate memory section.

Total concentration had an average value of 4.29(0.71) and 43% ($n=37$) of participants recorded the maximum score. Two sub-sets of concentration were backward recalling of digits and months in reverse order. The recorded average for backward recalling of digits was

equal to 3.32(0.67) that 44.2 % ($n=38$) of participants had a perfect score, and they recorded an average value of 0.96(0.18) in recalling of months in reverse order. Only three participants could not express the months in reverse order correctly; therefore, 96.5 % ($n=83$) of participants recorded the maximum score.

Total m-BESS was reported with an average value of 5.34(5.36). Approximately, 8% of participants ($n=7$, 8.1%) performed m-BESS without any error.

Sex

Male and female participants presented different results for some components of the SCAT5. Most common symptoms reported by women were headache, fatigue/low energy levels, and feeling nervous or anxious, whereas commonly reported symptoms in males were headache, feeling of decreased movement, and fatigue/low energy levels, respectively.

Table 3. Persian Sport Concussion Assessment Tool 5 (SCAT5) results by sex: Mann-Whitney U test for nonparametric component

Items	Mean Rank		Mann-Whitney U	Wilcoxon W	Sig.
	Men	Women			
Orientation	44.50	42.55	882	1872	0.165
Concentration total score (digits months)	55.82	31.74	406.50	1396	0.001*
Delay recall 10 words	41.81	45.11	853	1756	0.51
Neurological screen	43.5	43.5	924	1827	1
Beck Depression Inventory (BDI) score	38.33	48.43	707	1610	0.06

*Significance level $P < 0.005$.

Table 4. Test-retest reliability

Items	test		Retest With 7 Days Interval		α Cronbach	ICC	95% Confidence Interval	
	Mean \pm SD	Min-Max	Mean \pm SD	Min-Max			Lower	Upper
Number of symptoms	9.98 \pm 3.84	4-19	4.09 \pm 3.17	0-14	0.86	0.48	-0.14	0.81
Severity of symptoms	22.92 \pm 14.77	5-73	7 \pm 6.72	0-37	0.78	0.49	-0.22	0.79
Immediate memory (10-word list)	23.25 \pm 2.95	14-28	23.90 \pm 2.65	16-28	0.95	0.93	0.84	0.93
Digits backward	3.24 \pm 0.62	2-4	3.50 \pm 0.5	3-4	0.84	0.83	0.69	0.90
Concentration total score (digits months)	4.34 \pm 0.62	3-5	4.50 \pm 0.50	4-5	0.84	0.83	0.69	0.90
Standardized assessment of concussion (SAC)	39.42 \pm 3.91	27-46	40.55 \pm 3.11	30-46	0.93	0.91	0.74	0.96
mBSS Total Errors	5.69 \pm 5.84	0-30	2.44 \pm 2.88	0-14	0.80	0.70	0.14	0.87
Delay recall (10-word list)	6.84 \pm 0.95	5-9	7.15 \pm 0.77	5-9	0.84	0.81	0.63	0.90

Table 5. Ceiling & floor effect

Items	%	
	Ceiling effect	Floor effect
Number of symptoms	2.3	5.8
Severity of symptoms	1.2	3.5
orientation	97.7	2.3
Immediate memory 10words	3.5	1.2
Concentration (digits backward)	44.2	11.6
Concentration (months reverse order)	96.5	3.5
Concentration total (digits+months)	43	1.2
Standardized assessment of concussion (SAC)	1.2	3.5
mBSS Total Errors	1.2	8.1
Delay recall (10-word list)	1.2	1.2

There was a sex-oriented difference in the number of symptoms ($t=3.822$, $P<0.001$) and severity of symptoms ($t=3.21$, $P<0.001$). Females had more symptoms with more severity. Also, there were significant differences in SAC, immediate memory (10-word list), m-BESS, and total concentration ($P<0.001$). Scores in SAC were obtained as 36.86(4.95) and 40.09 (3.39) for females and males, respectively. In immediate memory, scores of 21.25(3.85) and 23.80(2.41) were obtained for females and males, respectively and in m-BESS, males had better performance with lower errors (3.21 \pm 2.77 in comparison with 7.38 \pm 6.39).

The details and more explanations about the performance of male and female participants in the Persian version of SCAT5 are reported separately in [Tables 2 and 3](#).

Validity

Construct validity was specified by measuring spearman's correlation for the overall sub-scales of Persian SCAT5 in comparison with the BDI, Spearman correlation coefficient (ρ) was found between components of SCAT5 and the BDI in the following order: number of symptoms (0.57) ($P<0.001$), severity of symptoms (0.50) ($P<0.001$), orientation (-0.11) ($P=0.304$),

immediate memory (10-word list) (-0.14) (0.188), concentration (backward recalling of digits) (-0.21) ($p=0.05$), total concentration score (-0.24) ($P=0.024$), SAC (-0.14) ($P=0.188$), m-BESS (0.2) ($P=0.05$), and delayed recall (10-word list) (0.04) ($P=0.699$).

Reliability

Among 52 participants re-evaluated after seven days, 20 men and 32 women with a Mean \pm SD age of 18.26 \pm 3.41 years old and Body Mass Index (BMI) 19.55 \pm 2.32 participated.

Summary of scores of the Persian SCAT5 at the beginning and seven days later for a retest is presented in Table 4. Regarding test-retest reliability, the Persian SCAT5 questionnaire showed excellent reliability for all items ($ICC>0.75$) except for the number of symptoms, the severity of symptoms, and m-BESS that showed moderate to good reliability (ICC from 0.4-0.74).

Concerning internal consistency, the Cronbach's alpha was calculated for all the sub-scales of Persian SCAT5, including the number of symptoms, the severity of symptoms, immediate memory (10-word list), backward recalling of digits, total concentration score, SAC, m-BESS, and delayed recall (10-word list). The Cronbach's alpha coefficient was obtained in the following order for these items: 0.86, 0.78, 0.95, 0.84, 0.84, 0.93, 0.80, and 0.84, respectively. The Cronbach's alpha coefficient was more than 0.70 for all items; thus, all these values indicated a high correlation in the Persian version of SCAT5.

Ceiling and floor effect

One of the possible problems in measurements is the ceiling and floor effect, indicating the inadequacy of the questionnaire in measuring the minimum and maximum scores of items. The existence of the ceiling and floor effect is proved when 15% of points are obtained in the highest or lowest possible amounts. The ceiling effect was observed in three components, including orientation and concentration (backward recalling of digits + recalling of months in reverse order). A summary of information about ceiling and floor effects is mentioned in Table 5.

Discussion

In this study, the SCAT5 was cross-culturally adapted for participants in Iran and was translated into Persian. The original SCAT has been previously translated to Japanese, German, Spanish, Chinese, and Arabic versions

[11, 12]; but, only the Chinese and Arabic versions have been validated.

In the process of translation and cultural adaptation, special attention was paid to the use of appropriate and common words in Persian, maintaining cultural harmony by replacing appropriate words and terms, finding semantic and perceptual equivalents, harmony, and coordination with commonly spoken terms, and behavioral habits of Persian.

Regarding construct validity, two components of the Persian SCAT5, including the number and severity of symptoms had a moderate correlation with the Persian version of BDI, and m-BESS had a poor correlation with the Persian version of BDI. Other components of Persian SCAT5 did not have a significant correlation with the Persian version of BDI.

Because BDI is a psychological questionnaire, it was expected to be highly correlated with parts of Persian SCAT5 that have psychological dimensions, and having a low correlation with other parts of the Persian SCAT5 that measure different dimensions.

Also, there was a high correlation between Persian SCAT5 components that measure the same dimensions, such as the number of symptoms, the severity of the symptom, and immediate memory with delayed recall memory. Also, there was a low correlation between different components; for example, immediate memory with m-BESS and severity of symptom with concentration.

Cronbach's alpha coefficient was low for the whole Persian SCAT5 items

This can be justified by the fact that the SCAT5 questionnaire is a multidimensional standardized questionnaire that is able to investigate different aspects of concussion [1], such as psychological, cognitive (SAC test), memory, concentration, balance, and neurological features. Therefore, because components of SCAT5 have provided a multifaceted assessment tool for covering all aspects of concussion, it seems that items of this tool should not be very inter-related [13]. Similarly, Yeung et al. reported relatively low internal consistency for the Chinese SCAT3.

There was a sex-oriented difference in some of the components in Persian SCAT5. The number and severity of the reported symptoms were higher in females than males. This finding is similar to the previous research that reported significant differences between males and

females for several baselines and post-concussion outcome measures [14-17]. Also, males had better performance in SAC, m-BESS, and memory testing.

Hurtubise et al. (2018) reported no significant difference in SCAT3 scores between males and females in baseline and post-concussion, the only significant difference was in orientation between males and females post-concussion [18]. Echemendia et al. in a systematic review showed that females had better performance on the m-BESS than males [4].

Perhaps, the findings of this study can be explained and justified as the severity of the injury was significantly higher in women, which influenced all parts of the questionnaire and caused reporting more about the number of symptoms and severity of symptoms and weak memory function, balance performance, and SAC scores. It seems that according to demographic characteristics in different communities, scores of different parts of the SCAT5 may be different.

Regarding test-retest reliability, the Persian SCAT5 had a 95% CI for all items. ICC for all items showed excellent reliability except for the total number of symptoms, symptom severity score, and m-BESS that had moderate to good reliability. This condition can be explained by the fact that due to instability of the symptoms of concussion and elimination and disappearance of symptoms 5-7 days after injury and existence of 7-day interval in re-evaluation of patients, a large number of symptoms disappear and severity of scores decreases. This finding is in agreement with the previous findings. Esther et al. (2016) evaluated the validity and reliability of the SCAT3 questionnaire in high school and post-traumatic participants and found that the main and key component in assessing concussion is self-reporting of symptoms and the checklist of symptoms showed a significant decrease seven days after injury [14]. Similarly, Hurtubise et al. (2018) demonstrated that the only clinically significant changes on SCAT3 were the self-reported symptoms, and concussion was not associated with a change in immediate memory, concentration, or coordination [18]. Also, in a systematic review done by Echemendia et al. (2017), it was stated that the clinical utility of the SCAT and its components significantly decreased after 3-5 days post-injury [4]. Also, Echemendia et al. mentioned that utility of SAC and m-BESS has not yet been established for measuring recovery after five days.

The existence of the ceiling and floor effect is proved when 15% of points are obtained in the highest or lowest possible amounts. Regarding the ceiling and floor effect in items of Persian SCAT5, the ceiling effect was observed in three components, including orientation and

concentration (backward recalling of digits + recalling of months in reverse order). Orientation showed 97.7% of the ceiling effect. Concentration (backward recalling of digits) had 44.2% of the ceiling effect. Concentration (recalling of months in reverse order) had 96.5 % of a ceiling effect. Petit et al. reported the ceiling effect for orientation so that 95.7% of participants recorded the maximum score [19]. Also, the results of another study showed the ceiling effect for sub-component of SAC [4, 5, 20].

The previous research has shown the ceiling effect for the 5-word list of immediate memory, and Norheim et al. reported that the 10-item word list on SCAT5 eliminated the ceiling effect observed on the 5-item word list of the SCAT3 [21]. Therefore, in this study, only a 10-word list was used. In the 10-word list of immediate memory, no ceiling effect was found.

Conclusions

Our results indicated that the Persian version of SCAT5 is a valid and reliable tool that can be used by medical professionals and health care providers in sideline concussion screening in native Persian-speaking athletes.

Ethical Considerations

Compliance with ethical guidelines

This study was approved by the Ethics Committee of the Iran University of Medical Science (Code: IR.IUMS.REC.1399.1413).

Funding

The paper was extracted from the MSc. thesis of the first author, Department of physiotherapy, Faculty of rehabilitation science, Iran University of Medical Science.

Authors' contributions

Conceptualization, Supervision: Soheil Mansour Sohani; Methodology: Reza Salehi, Marzieh Yassin; Investigation, Writing – review & editing: All authors; Writing – original draft: zahra imani; Funding acquisition, Resources: Zahra Imani, Soheil Mansour Sohani

Conflict of interest

The authors declared no conflict of interest.

Acknowledgments

We would like to thank all the participants in this study, and all the people who helped us in this study.

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مقاله پژوهشی

معادل سازی فرهنگی (ترجمه) و بررسی روایی و پایایی نسخه فارسی پرسشنامه SCAT5

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چکیده

تاریخ دریافت: ۲۸ شهریور ۱۴۰۰
تاریخ پذیرش: ۲۱ آذر ۱۴۰۰
تاریخ انتشار: ۰۹ دی ۱۴۰۰

مقدمه: هدف از این مطالعه ترجمه و ارزیابی روایی و پایایی نسخه فارسی ابزار SCAT5 در میان ورزشکاران رزمی کار ایرانی بود. **مواد و روش ها:** فرآیند ترجمه و تطابق فرهنگی در چندین مرحله با دستورالعمل های ارائه شده توسط Beaton و همکاران انجام شد. ۸۶ ورزشکار رزمی کار ایرانی، ۴۴ زن و ۴۲ مرد (در این مطالعه شرکت کردند. آمار توصیفی برای کلیه موارد نسخه فارسی SCAT5 گزارش شد. برای تعیین روایی سازه، همبستگی بین آیتیم های نسخه فارسی SCAT5 و پرسشنامه افسردگی بک (beck) گرفته شد. پایایی پرسشنامه از دو جنبه مختلف پایایی آزمون-بازآزمون و هم خوانی درونی تعیین شد. **یافته ها:** فرآیند ترجمه و تطابق فرهنگی با حفظ سازگاری فرهنگی از طریق جایگزینی کلمات و اصطلاحات مناسب و یافتن معادل های معنایی و ادراکی انجام شد. بین نتایج شرکت کنندگان مرد و زن تفاوت معناداری وجود داشت. برای مولفه های SCAT5 در مقایسه با BDI، ضریب همبستگی مرتبه رتبه اسپیرمن (ρ) با نسخه فارسی BDI $0/57$ ($P < 0/001$) از نظر تعداد علائم و شدت علائم $0/50$ متوسط بود ($P < 0/001$). در مورد پایایی آزمون بازآزمایی، نسخه فارسی پرسشنامه SCAT5 پایایی عالی برای تمامی گویه ها ($ICC > 0/75$) و پایایی متوسط برای تعداد علائم ($ICC = 0/48$) و شدت علائم ($ICC = 0/49$) نشان داد. ضریب آلفای کرونباخ برای تمامی موارد نسخه فارسی SCAT5 بیش از $0/70$ بود. **نتیجه گیری:** نسخه فارسی پرسشنامه SCAT5 ابزاری روا و با تکرارپذیری متوسط برای ارزیابی ضربه به سر حاد ورزشی توسط پزشکان و افراد حرفه‌ای دارای گواهی مراقبت از سلامت است. اثر سقف در آیتیم های موقعیت یابی زمانی و دو بخش از آیتیم تمرکز (شمارش معکوس ارقام و شمارش معکوس ماه ها) این پرسشنامه مشاهده شد.

کلیدواژه‌ها:

معادل سازی فرهنگی، ترجمه، روایی، پایایی، ضربه به سر، هنرهای رزمی

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Cite this article as Imani Pahlavanloo Z, Yassin M, Salehi R, Mazaherinezhad A, Mansour Sohani S. Translation, Cross-cultural Adaptation, and Study of the Validity and Reliability of the Persian Version of Sport Concussion Assessment Tool 5 (SCAT5) Function and Disability Journal. 2021; 4:E43. <http://dx.doi.org/10.32598/fdj.4.43>

<http://dx.doi.org/10.32598/fdj.4.43>

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