

ORIGINAL ARTICLE

Cross-cultural adaptation of the Athlete Fear Avoidance Questionnaire for Turkish-speaking athletes

Türkçe konuşan sporcular için Sporcu Korku Kaçınma Anketi'nin kültürler arası uyarlaması

Seyde Büşra KODAK¹, Naime ULUĞ², Caner KARARTI³, Muhammed İhsan KODAK³

Abstract

Purpose: The aim of this study was to the Athlete Fear Avoidance Questionnaire (AFAQ) into the Turkish language for Turkish-speaking athletes.

Methods: AFAQ-TR performed on 146 high school athletes (88 males and 58 females; (mean age: 17.39±1.6 years, body mass index 21.92±3.82 kg/m²). Complies with worldwide standards, the questionnaire was cross-culturally adapted. The psychometric evaluation included an assessment of reliability with internal consistency, intraclass correlation coefficient (ICC (2,1)), standard error of measurement (SEM) and minimum detectable change (MDC), construct validity with exploratory factor analysis, convergent validity, and feasibility analysis. We used the Numerical Pain Rating Scale (NPRS), the Pain Catastrophizing Scale (PCS) and the Fear Avoidance Beliefs Questionnaire (FABQ) subscales (FABQ-Physical Activity (FABQ-PA) and FABQ-Work (FABQ-W)).

Results: The ICC (2,1) of the AFAQ-TR was 0.912 (95% CI: 0.878–0.937). The SEM and MDC95 for the AFAQ-TR were 2.61 and 7.23, respectively. The findings of the factor analysis indicated that AFAQ-TR had a two-factor solution, and 10-item. As hypothesized a priori, the AFAQ-TR demonstrated a moderate correlation with the NPRS ($r=0.207$; $p=0.013$), PCS ($r=0.723$; $p<0.001$), FABQ-PA ($r=0.539$; $p<0.001$), and FABQ-W ($r=0.530$; $p<0.001$). None of the athletes met the maximum or minimum achievable scores, both overall and per item. Thus, there were no floor or ceiling effects.

Conclusion: The AFAQ-TR is a reliable, valid, and feasible questionnaire for Turkish-speaking athletes. It is recommended that clinicians utilize the AFAQ-TR in order to evaluate the fear-avoidance variables in athletes.

Keywords: Fear-avoidance, Fear-avoidance behavior model, Athletic injuries, Psychometrics, Rehabilitation, Cross-cultural adaptation.

Öz

Amaç: Bu çalışmanın amacı Sporcu Korku Kaçınma Anketi'ni (AFAQ) Türkçe konuşan sporcular için Türkçe'ye uyarlamaktır.

Yöntem: AFAQ-TR 146 lise sporcusu üzerinde uygulanmıştır (88 erkek ve 58 kadın; (ortalama yaş: 17,39±1,6 yıl, vücut kütle indeksi 21,92±3,82 kg/m²). Psikometrik değerlendirme, iç tutarlılık, sınıf içi korelasyon katsayısı (ICC), ölçümün standart hatası ve minimum tespit edilebilir değişim ile güvenilirlik; açıklayıcı faktör analizi, yakınsak geçerlilik ve fizibilite analizi ile yapı geçerliliği değerlendirilmesini içeriyordu. Sayısal Ağrı Derecelendirme Ölçeği (NPRS), Ağrı Felaketleştirme Ölçeği (PCS) ve Korkudan Kaçınma İnançları Anketi (FABQ) alt ölçekleri (FABQ -Fiziksel Aktivite (FABQ-PA) ve FABQ -İş (FABQ-W)) kullanılmıştır.

Bulgular: AFAQ-TR'nin ICC (2,1) değeri 0,912 (%95 CI: 0,878-0,937), SEM ve MDC değerleri ise sırasıyla 2,61 ve 7,23 olarak bulunmuştur. Faktör analizi bulguları, AFAQ-TR'nin iki faktörlü ve 10 maddelik bir çözüme sahip olduğunu göstermiştir. Önceden varsayıldığı gibi AFAQ-TR, NPRS ($r=0,207$; $p=0,013$), PCS ($r=0,723$; $p<0,001$), FABQ-PA ($r=0,539$; $p<0,001$) ve FABQ-W ($r=0,530$; $p<0,001$) ile orta düzeyde bir korelasyon göstermiştir. Sporcuların hiçbirisi hem genel hem de madde başına ulaşabilecek maksimum veya minimum puanları karşılamamıştır. Dolayısıyla, taban veya tavan etkisi görülmemiştir.

Sonuç: AFAQ-TR, Türkçe konuşan sporcular için güvenilir, geçerli ve uygulanabilir bir ankettir. Klinisyenlerin sporcularda korku-kaçınma değişkenlerini değerlendirmek için AFAQ-TR'yi kullanmaları önerilmektedir.

Anahtar kelimeler: Korku-kaçınma, Korku-kaçınma davranış modeli, Atletik yaralanmalar, Psikometri, Rehabilitasyon, Kültürlerarası adaptasyon.

1: Kırşehir Ahi Evran University, Department of Vocational School of Health Services, Kırşehir, Türkiye.

2: Atılım University, Department of Physiotherapy and Rehabilitation, Ankara, Türkiye.

3: Kırşehir Ahi Evran University, School of Physiotherapy and Rehabilitation, Kırşehir, Türkiye.

Corresponding Author: Seyde Büşra Kodak: seyde.kodak@ahievran.edu.tr

ORCID IDs (order of authors): 0000-0003-2226-6056; 0000-0002-3062-1655; 0000-0002-4655-0986; 0000-0001-7164-5162

Received: September 26, 2024. Accepted: December 16, 2024.



INTRODUCTION

Sports injury is a common occurrence among athletes, with many experiencing it annually.^{1,2} Sports injuries cause pain and physical impairment.² However, they also have a psychological impact.³ Fear of re-injury is a common psychological response to sports injury.⁴⁻⁷ Apprehension, melancholy, disappointment, stress and reduced self-respect are other possible psychological reactions of an injured athlete.⁷⁻¹³

These psychological reactions are typically most pronounced immediately following a sports injury and tend to subside during the rehabilitation process.¹⁴⁻¹⁶ However, they often recur just before the athlete's return to sport. If the problem is not resolved, psychological reactions to the injury may increase, which can affect the rehabilitation process and increase the time it takes to return to sport.¹⁷

The existing literature contains a few scales of scales that are designed to assess the psychological preparedness of athletes to resume competition. These include the Athlete Fear Avoidance Questionnaire (AFAQ), the Sports Inventory for Pain, and the Injury-Psychological Readiness to Return to Sport Scale.^{18,19}

The AFAQ was developed with the specific intention of assessing fear avoidance or pain-related fear in athletes.²⁰ The process of distinguishing between an exaggerated pain experience and behavior and real pain sensation in people who experience it was explained by the development of the fear avoidance model. Elevated levels of fear avoidance can result in long-term pain and impairment. Consequently, it is possible to utilize this phenomenon to forecast the duration of rehabilitation.²⁰ Consequently, it can be posited that the incorporation of fear avoidance into the rehabilitation plan may prove advantageous in terms of the creation of an optimal and efficacious plan, thereby reducing the time required for the athlete to resume participation.

A review of the literature revealed that no study had been conducted on the intercultural adaptation of the AFAQ for Turkish-speaking athletes. Consequently, the objective of this study was to transcribe the AFAQ into the Turkish language (AFAQ-TR) in terms of test-

retest reliability, validity, and feasibility for Turkish-speaking athletes.

METHODS

Participants

The research included 146 high school athletes from a range of sports, including athletics, volleyball, wrestling, football, basketball, and handball. The study population comprised 20 athletes who were currently experiencing an injury and 126 individuals who had previously suffered from injury. The study was deemed to be ethically sound by the local ethics committee (2023/76143). The athletes included were requested to sign the study a written informed acquiesce form in compliance with the Declaration of Helsinki. The inclusion criteria were as follows: they had to have been licensed for more than five years; they had to have been participating in the sport and training for at least a year; and they had to be training for at least five hours a week. The exclusion criteria were as follows: having a medical background for systemic, cognitive, or vision disorders.

Procedures

Firstly, the Turkish version of the AFAQ, for which permission was obtained, was culturally adapted to the Turkish society. In this process, the questionnaires were de facto translated from English to Turkish by two individuals who were not the same. A single Turkish translation was created by translating the questionnaire into Turkish. This translation was carried out by two native English speakers who were also fluent in Turkish. This translation was then compared with the original questionnaire. Following these procedures, the questionnaire was administered to 30 individuals as part of a pilot study. The questionnaire was prepared for use following the identification of items that were not comprehensible to the individuals to whom it was applied.

The participants were requested to fulfill the AFAQ, the Fear-Avoidance Beliefs Questionnaire (FABQ),²¹ and the Pain Catastrophizing Scale (PCS).²² Prior to commencing the study, each participant was required to sign the relevant consent form confirmed by the ethics committee of our

institution. The participants were informed on the data collection form that their information would be kept confidential and used solely for the study's stated purposes. The study was also approved by the Commission.

The athletes' demographic data (age, sex), anthropometric data (stature and heaviness) and sport data (sport branch, sport year, weekly training time) were recorded. Once all questionnaires had been explained, athletes completed the AFAQ, FABQ and PCS questionnaires in order to determine convergent validity (first session). Subsequently, all athletes completed a second AFAQ questionnaire (second session) In order to ascertain the test-retest reliability. The sessions were conducted one week apart.

Outcome measurements

Turkish version of the Athlete Fear Avoidance Questionnaire

The AFAQ-TR (Athletes' Fear of Activity Questionnaire-Trait) was developed to assess athletes' fear avoidance in relation to injuries. It comprises ten items on the Likert scale, each with a five-point rating. The extent to which athletes avoid injury-related fear is gauged by means of a self-administered questionnaire, with responses ranging from 1 (strongly disagree) to 5 (strongly agree). The scale, which ranges from 10 to 50, is employed to ascertain the cumulative score. Higher scores are indicative of more extreme fear-avoidance behaviors.²³

Numerical Pain Rating Scale

Participants are required to rate the intensity of their pain over the past 24 hours on an eleven-point numerical scale, the scale runs from 0, which represents no pain, to 10, which represents the worst conceivable suffering.²⁴

Fear Avoidance Beliefs Questionnaire

A personal assessment form was administered to participants, comprising two subscales. One assesses the subject's beliefs about physical activity (the Fear Avoidance Beliefs Questionnaire - Physical Activity, FABQ-PA) and the other their beliefs about work (FABQ-W).^{21,25} A seven-point Likert scale is employed to assess responses to the 16-item questionnaire. Higher scores are indicative of a higher degree of fear avoidance beliefs. Higher scores on the seven-point Likert scale are indicative of a more pronounced degree of fear avoidance beliefs in relation to the items.

Pain Catastrophizing Scale

A self-report survey in which participants rate the frequency with which they experience 13 different pain-related thoughts and sensations on a 5-point scale, from 0 (never) to 4 (always). Higher total scores indicate a higher degree of catastrophizing; the score ranges from 0 to 52. The construct is distinguished by three interconnected elements: hopelessness, introspection, and exaggeration.²⁶

Psychometric properties of the AFAQ

Reliability study

For the test-retest assessment, the AFAQ-TR questionnaire was administered again to all participants 7 days after the first assessment. It was ensured that the clinical characteristics of the athletes were stable during this period.²⁷

Validity study

Construct validity was examined using exploratory factor analysis (EFA) for the AFAQ-TR questionnaire. The factor loading patterns, the scree plot, and the proportion of variance explained by the factorial model were examined.²⁸ Correlation coefficients were utilized to examine the link between the AFAQ-TR, FABQ, and PCS in order to assess convergent validity.

Feasibility

To check the feasibility of the measure, the amount of time spent by patients in completing the AFAQ-TR questionnaire was noted. We also looked at ceiling and floor effects, which are considered to be present when more than 15% of respondents receive the minimum or maximum score theoretically possible¹².

Statistical analysis

The statistical analysis was performed using IBM SPSS Statistics 22.0 for Windows (IBM Corp., Armonk, NY, USA). For continuous variables, descriptive statistics were given as mean \pm standard deviation (SD), and for categorical variables, as ratios (%). The internal consistency and test-retest reliability of the AFAQ-TR were evaluated using Cronbach's alpha and ICC_{2,1} with 95% confidence intervals (CIs), respectively.²⁷ The acceptable threshold for Cronbach alpha values is 0.7 or above, indicating satisfactory internal consistency. An ICC value of less than 0.5 is indicative of poor reliability, 0.5 - 0.75 indicates moderate reliability, 0.75 - 0.9 indicates good reliability, and a value greater than 0.90 indicates excellent reliability.²⁷ To examine the visual agreement

between the first and second AFAQ-TR sessions, a Bland-Altman plot was created. The discrepancy between the two sets of measurements is illustrated by the display of 95% confidence intervals (CIs) and 95% limits of agreement (LoA). Additionally, the minimal detectable change (MDC) and standard error of measurement (SEM) were computed. The formula for estimating SEM is $SD \times \sqrt{(1 - R)}$. In this instance, SD represents the standard deviation derived from the initial assessment, while R is the AFAQ-TR questionnaire's validity coefficient.¹⁰ The SEM is multiplied by $1.96 \times \sqrt{2}$, where 1.96 denotes the 95% CI and $\sqrt{2}$ denotes the measurement error related to two measurements, to determine the MDC threshold value.²⁷

EFA was used to analyze the factor structure of the AFAQ-TR Principal component analysis with varimax rotation was carried out using the first AFAQ-TR score.²⁹ The sampling adequacy was considered adequate, with a Kaiser-Meyer-Olkin (KMO) value of 0.7-1.0, while the results of Barlett's sphericity test were significant at $p < 0.001$, indicating the usefulness of EFA for data analysis. The scree plot, an eigenvalue cutoff greater than 1.0, and at least 10% variance were also considered for factor extraction.²⁹

The associations between the AFAQ-TR, FABQ, and PCS were examined using Pearson product-moment correlation coefficients. The correlation coefficients were classified as follows: a value greater than 0.5 was considered indicative of a strong correlation, a value between 0.3 and 0.5 was considered indicative of a moderate correlation, and a value between 0.2 and 0.3 was considered indicative of a weak correlation. A significance threshold of $p < 0.05$ was established.

Sample size calculation

A minimum sample size of at least 100 was required in terms of a subject-to-item ratio regarding 10 items. In order to verify a test-retest correlation of 0.85 with a 95% confidence interval (CI) width of 0.1 ($\alpha = 0.05$), at least 120 subjects were required.^{23,30}

RESULTS

Translation

There were no problems with the

translation procedure. The final version of the AFAQ-TR is included in the Appendix.

Reliability

A total of 146 athletes were incorporated into the research. Descriptive and clinical characteristics of the participants are presented in Table 1. The test-retest reliability of the AFAQ-TR was found to be excellent (≥ 0.90). The ICC_{2,1} of the AFAQ-TR was 0.912 (95% CI: 0.878-0.937). The internal consistency of the questionnaire was acceptable overall (≥ 0.7), with the exception of question 4 (Table 2). The SEM and MDC₉₅ for the AFAQ-TR were 2.61 and 7.23, respectively (Table 2). The results of the Bland-Altman analysis indicated that the 95% limits of agreement (LoA) range for the AFAQ-TR variance between test and retest values was -8.625 to 10.465 units (Figure 1).

Table 1. Descriptive and clinical characteristics of the participants (N=146).

	Mean±SD
Age	17.4±1.6
Body mass index (kg/m ²)	21.9±3.8
AFAQ-TR (first assessment)	23.6±8.8
AFAQ-TR (second assessment)	22.7±8.3
FABQ-PA	10.0±7.4
FABQ Work	12.0±13.3
PCS	15.9±11.8
Total sport practice time (year)	4.0±2.7
	n (%)
Gender (Female/Male)	88/58 (60.3/39.7)
Sports	
Volleyball	66 (45)
Arm Wrestling	33 (23)
Wrestling	19 (13)
Athletics	15 (10)
Handball	11 (8)
Football	2 (1)

AFAQ: Athlete Fear Avoidance Questionnaire. FABQ: Fear-Avoidance

Construct validity

The KMO value was found to be 0.854, with a significant result for Bartlett's sphericity test [$\chi^2(45) = 554.39$] ($p < 0.001$). Furthermore, the sample size has been demonstrated to be sufficient for EFA. It was concluded that the AFAQ-TR, which consists of 10 items, has a two-factor solution explaining 57.96% of the total

variance (Figure 2). Factor loadings after varimax rotation are shown in Table 3.

Convergent validity

There were weak to strong significant correlations between AFAQ-TR scores and FABQ activity ($r=0.539$, $p<0.001$), FABQ work ($r=0.530$, $p<0.001$), PCS ($r=0.723$, $p<0.001$) and VAS ($r=0.207$, $p<0.001$) scores.

Feasibility

The AFAQ-TR questionnaire was completed by all participants in less than 5 min. None of the athletes met the maximum or

minimum achievable scores, both overall and per item. Thus, there were no floor or ceiling effects.

DISCUSSION

This study's objective was to adjust the AFAQ to the Turkish language. It was found that the AFAQ-TR is a reliable, valid, and feasible questionnaire for Turkish-speaking athletes.

Table 2. Test-retest reliability, standard error of measurement, and minimal detectable changes of the Athlete Fear Avoidance Questionnaire-TR.

	Test	Re-test	ICC _{2,1} (95% CI)
AFAQ-TR Items (Median (Min-Max))			
1	2 (1-5)	2 (1-5)	0.833 (0.769-0.880)
2	2 (1-5)	2 (1-5)	0.860 (0.806-0.899)
3	3 (1-5)	2,5 (1-5)	0.869 (0.817-0.905)
4	2 (1-5)	2 (1-5)	0.734 (0.631-0.809)
5	2 (1-5)	2 (1-5)	0.866 (0.814-0.904)
6	2 (1-5)	2 (1-5)	0.870 (0.820-0.906)
7	2 (1-5)	2 (1-5)	0.855 (0.799-0.896)
8	2 (1-5)	2 (1-5)	0.837 (0.774-0.883)
9	2 (1-5)	2 (1-5)	0.875 (0.827-0.910)
10	3 (1-5)	2 (1-5)	0.846 (0.787-0.889)
AFAQ-TR Total (Mean±SD)	23.6±8.8	22.7±8.3	0.912 (0.878-0.937)
SEM	2.610		
MDC ₉₅	7.234		
Cronbach's alpha (α)	0,861	0,861	

(a): Median (Minimum-Maximum). ICC: Intra-class correlation coefficient. CI: Confidence Interval. SEM: Standard error of measurement with a 95%

Table 3. Factor loadings after varimax rotation of the Athlete Fear Avoidance Questionnaire-TR (AFAQ-TR) items.

Items	Factor ₁	Factor ₂
1	0.643	
2	0.648	
3		0.546
4	0.478	
5	0.744	
6	0.749	
7	0.704	
8	0.705	
9	0.762	
10	0.741	

Exploratory factor analysis (EFA) was used to analyze the factor structure of the AFAQ-TR Principal component analysis with varimax rotation was carried out using the first AFAQ-TR score.

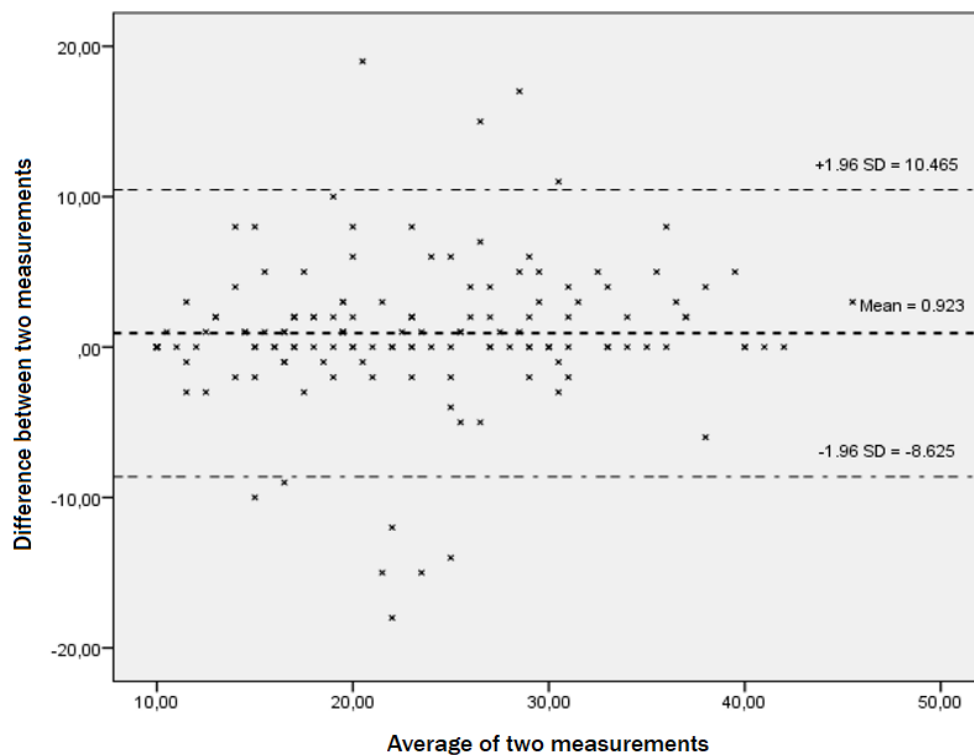


Figure 1. Bland-Altman plot.

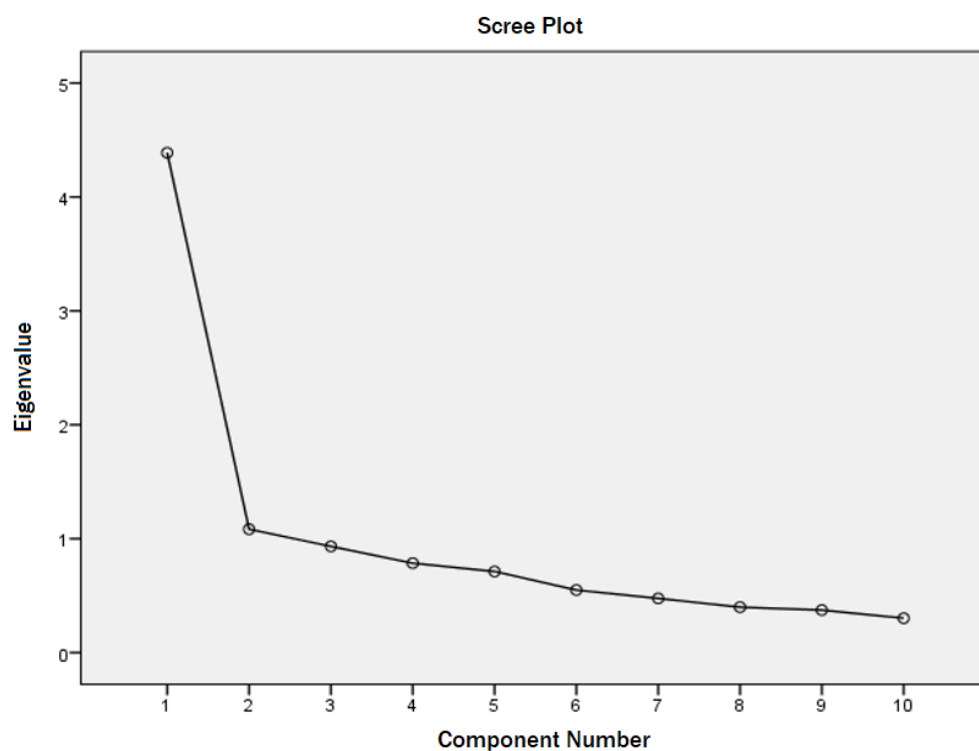


Figure 2. Scree plot.

In the literature, there were three studies that quantified the measurement properties of the AFAQ.^{20,23,31} Regarding the internal structure, the original,²⁰ Italian²³ and Portuguese³¹ versions identified a unidimensional structure of the questionnaire. However, when Kaiser's criterion was used for analysis in the main article of the scale, four factors were found to exist.⁸ However, this method is known to show more factors than usual. The Italian version emphasizes that items 6 and 9 present low factor loadings, suggesting the presence of a small secondary dimension²³. In our study, item 3 of the AFAQ-TR constitutes a small secondary factor. Considering the original study and the Italian version, our study seems to be consistent.

Regarding reliability, we determined the ICC value as 0.912. The original version²⁰ of AFAQ did not calculate test-retest reliability using ICC, only providing a Cronbach alpha value of 0.80. A higher ICC value (0.95) was found in the Italian version²³ of AFAQ than in this study. A lower ICC value (0.85) was found in the Portuguese version³¹ of AFAQ than in this study. However, all values were within the acceptability cut-off points. In our study, the test-retest reliability of AFAQ-TR was found to be excellent (≥ 0.90).³² The Turkish version of AFAQ is an adequate measurement tool for the assessment of fear of return to sports, a clinical variable considered important in the rehabilitation of athletes.

There is currently no agreement on the scales used to assess the fear avoidance-related outcomes of treatment or follow-up for athlete. To date, the FABQ²¹ and PCS³³ have been used for the assessment of the emotional status of athletes. Although some items from these questionnaires were included in the development process of the original version of the AFAQ,²⁰ these questionnaires do not provide enough specific measurements related to the injury-related fear avoidance measurements in athletes.

The fact that the AFAQ is a sport-specific aspect in addition to the PCS or the FABQ is a noticeable difference. It is possible to associate AFAQ with PCS or FABQ in terms of evaluating common dimensions. However, the inclusion of sport-specific measurements may enhance the preference of AFAQ. It is believed to be a more comprehensive questionnaire in terms of

biopsychosocial and multidisciplinary assessment of the athletes.

Previously published reports have indicated that the fear-avoidance model and the AFAQ may assist in understanding the psychological reactions of patients with musculoskeletal injuries. This understanding may facilitate the individualization of cognitive-behavioral and physical therapies as part of athletes' multimodal care with high levels of fear-avoidance beliefs. This represents a promising avenue for future research, as evidenced by the findings presented in references.^{34,35} When different measures of pain-related fear were used, similar results were previously seen in populations that were not athletes.³⁶ It can be reasonably deduced that future research evaluating athlete populations who have recently sustained musculoskeletal trauma should assess the consecutive relationships between the AFAQ-TR and rehabilitation outcomes. Moreover, for those exhibiting high degree of fear-avoidance, it is recommended that the AFAQ-TR be included as an outcome measure for the analysis of the effects of cognitive-behavioral interventions.³⁷

Limitations

It should be mentioned that there are some limitations on this study. Firstly, it is a cross-sectional study, which means that we are unable to evaluate the level of responsiveness of the AFAQ-TR. Secondly, the study was conducted via the administration of self-completed questionnaire, which precluded any consideration of the relationship between the results and clinical, functional and instrumental tests. We did not assess the phase of the injury or rehabilitation of each participant, and this should be considered in the analysis of our results. Nevertheless, our study differs from other AFAQ studies in that it was conducted with high school athletes.²³

Conclusion

In conclusion, The AFAQ-TR is a reliable, valid, and feasible questionnaire for Turkish-speaking athletes. It is recommended that clinicians utilize the AFAQ-TR in order to evaluate the fear-avoidance variables in athletes.

Acknowledgement: *None*

Authors' Contributions: **SBK:** study design, writing, project management, data collection / processing; **NU:** concept / idea development, study design; **CK:** data analysis / interpretation, literature search; **MIK:** data analysis / interpretation, literature search, providing subjects

Funding: *None.*

Conflicts of Interest: *None*

Ethical Approval: The protocol of the present study was approved by Atılım University Medical Faculty Clinical Research Ethics Committee (issue: 2023/76143, date: 15.12.2023).

REFERENCES

- Ivarsson A, Johnson U, Andersen MB, et al. Psychosocial factors and sport injuries: meta-analyses for prediction and prevention. *Sports Med.* 2017;47:353-365.
- Garrick JG, Requa RK. Sports and fitness activities: the negative consequences. *J Am Acad Orthop Sur.* 2003;11:439-443.
- Crossman J. Psychological rehabilitation from sports injuries. *Sports Med.* 1997;23:333-339.
- Bianco T, Malo S, Orlick T. Sport injury and illness: Elite skiers describe their experiences. *Res Q Exercise Sport.* 1999;70:157-169.
- Gould D, Bridges D, Udry E, et al. Stress sources encountered when rehabilitating from season-ending ski injuries. *Sport Psychol.* 1997;11(4):361-378.
- Kvist J, Ek A, Sporrstedt K, Good L. Fear of re-injury: a hindrance for returning to sports after anterior cruciate ligament reconstruction. *Knee Surg Sport Tr A.* 2005;13:393-397.
- Taylor J, Taylor S. Psychological approaches to sports injury rehabilitation. Lippincott-Williams & Wilkins; 1997.
- Cozzi AL, Dunn KL, Harding JL, et al. Kinesiophobia after anterior cruciate ligament reconstruction in physically active individuals. *J Sport Rehabil.* 2015;24:434-439.
- Nippert AH, Smith AM. Psychologic stress related to injury and impact on sport performance. *Phys Med Reh Clin N.* 2008;19:399-418.
- Porter DA, May BD, Berney T. Functional outcome after operative treatment for ankle fractures in young athletes: a retrospective case series. *Foot Ankle Int.* 2008;29:887-894.
- Vibe Fersum K, O'Sullivan P, Skouen J, et al. Efficacy of classification-based cognitive functional therapy in patients with non-specific chronic low back pain: A randomized controlled trial. *Eur J Pain.* 2013;17:916-928.
- Vlaeyen JW, Kole-Snijders AM, Boeren RG, et al. H. Fear of movement/(re) injury in chronic low back pain and its relation to behavioral performance. *Pain.* 1995;62:363-372.
- Walker N, Thatcher J, Lavalley D. Psychological responses to injury in competitive sport: a critical review. *J R Soc Promot Health.* 2007;127:174-180.
- Gignac MA, Cao X, Ramanathan S, et al. Perceived personal importance of exercise and fears of re-injury: a longitudinal study of psychological factors related to activity after anterior cruciate ligament reconstruction. *BMC Sports Sci Med Rehabil.* 2015;7:1-9.
- Hartigan EH, Lynch AD, Logerstedt DS, et al. Kinesiophobia after anterior cruciate ligament rupture and reconstruction: noncopers versus potential copers. *J Orthop Sports Phys Ther.* 2013;43:821-832.
- Langford JL, Webster KE, Feller JA. A prospective longitudinal study to assess psychological changes following anterior cruciate ligament reconstruction surgery. *Brit J Sport Med.* 2009;43:377-378.
- Wiese-Bjornstal DM. Psychology and socioculture affect injury risk, response, and recovery in high-intensity athletes: a consensus statement. *Scand J Med Sci Spor.* 2010;20:103-111.
- Meyers MC, Bourgeois AE, Stewart S, et al. Predicting pain response in athletes: Development and assessment of the Sports Inventory for Pain. *Int J Sport Exerc Ps.* 1992;14:249-261.
- Glazer DD. Development and preliminary validation of the Injury-Psychological Readiness to Return to Sport (I-PRRS) scale. *J Athl Training.* 2009;44:185-189.
- Dover G, Amar V. Development and validation of the athlete fear avoidance questionnaire. *J Athl Training.* 2015;50:634-642.
- Waddell G, Newton M, Henderson I, et al. A Fear-Avoidance Beliefs Questionnaire (FABQ) and the role of fear-avoidance beliefs in chronic low back pain and disability. *Pain.* 1993;52:157-168.
- Franchignoni F, Giordano A, Ferriero G, et al. Measurement precision of the Pain Catastrophizing Scale and its short forms in chronic low back pain. *Sci Rep-Uk.* 2022;12:12042.
- Monticone M, Dover G, Massidda M, et al. Cross-cultural adaptation and validation of the Athlete Fear Avoidance Questionnaire in Italian university athletes with musculoskeletal injuries. *Int J Rehabil Res.* 2022;45:223-229.

24. Farrar JT, Young Jr JP, LaMoreaux L, et al. Clinical importance of changes in chronic pain intensity measured on an 11-point numerical pain rating scale. *Pain*. 2001;94:149-158.
25. Monticone M, Baiardi P, Bonetti F, et al. The Italian version of the Fear-Avoidance Beliefs Questionnaire (FABQ-I): cross-cultural adaptation, factor analysis, reliability, validity, and sensitivity to change. *Spine*. 2012;37:E374-E380.
26. Sullivan MJ. The pain catastrophizing scale: user manual. Montreal: McGill University. 2009;1:36.
27. Stratford PW. Estimating the standard error of measurement from reliability studies. *Physiother Can*. 2004;56:27-30.
28. Boateng GO, Neilands TB, Frongillo EA, et al. Best practices for developing and validating scales for health, social, and behavioral research: a primer. *Front Public Health*. 2018;6:149.
29. Williams B, Onsman A, Brown T. Exploratory factor analysis: A five-step guide for novices. *Australas J Paramed*. 2010;8:1-13.
30. Bonett DG. Sample size requirements for estimating intraclass correlations with desired precision. *Stat Med*. 2002;21:1331-1335.
31. Reis-Junior JR, Bassi-Dibai D, Morais DN, et al. Translation, cross-cultural adaptation, and validation of the Athlete Fear Avoidance Questionnaire (AFAQ) into Brazilian Portuguese. *BMC Musculoskel Dis*. 2022;23(1):974.
32. Koo TK, Li MY. A guideline of selecting and reporting intraclass correlation coefficients for reliability research. *J Chiropr Med*. 2016;15:155-163.
33. Darnall BD, Sturgeon JA, Cook KF, et al. Development and validation of a daily pain catastrophizing scale. *J Pain Res*. 2017;18:1139-1149.
34. O'Connor S, Moran K, Sheridan A, et al. Fear avoidance after injury and readiness to return to sport in collegiate male and female Gaelic games players. *Sports Health*. 2021;13:532-539.
35. DiSanti J, Lisee C, Erickson K, et al. Perceptions of rehabilitation and return to sport among high school athletes with anterior cruciate ligament reconstruction: a qualitative research study. *J Orthop Sports Phys Ther*. 2018;48:951-959.
36. Monticone M, Ambrosini E, Rocca B, et al. Multimodal exercises integrated with cognitive-behavioural therapy improve disability of patients with failed back surgery syndrome: a randomized controlled trial with one-year follow-up. *Disabil Rehabil*. 2022;44:3422-3429.
37. O'Keeffe S, Chéilleachair NN, O'Connor S. Fear avoidance following musculoskeletal injury in male adolescent gaelic footballers. *J Sport Rehabil*. 2019;29:413-419.

Appendix. The Turkish version of the Athlete Fear Avoidance Questionnaire (The AFAQ-TR).

Sporcu Korku Kaçırma Anketi (SKKA)

Adı:

Spor dalı:

Tarih:

Talimatlar: Spor yaralanması sonrasında oluşan ağrınızla ilgili duygu ve düşüncelerinizi öğrenmek istiyoruz. Spor yaralanması sonrasında ağrı çektiğinizde bu duygu ve düşüncelerden hangisine ne derecede sahip olduğunuzu aşağıda verilen ölçeği kullanarak belirtiniz.

	1	2	3	4	5
	Hiç katılmıyorum	Çok az katılmıyorum	Orta derecede katılmıyorum	Büyük ölçüde katılmıyorum	Tamamen katılmıyorum
1. Asla sakatlanmadan önceki gibi oynayamayacağım.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Takımdaki rolümün değişmesi konusunda endişeliyim.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Aynı seviyede performans göstermezsem diğer insanların hakkımda ne düşüneceği konusunda endişeliyim	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. Sakatlığımın ne olduğundan emin değilim.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Mevcut sakatlığımın gelecekteki atletik yeteneklerimi tehlikeye attığına inanıyorum	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. %100 iyileşene kadar oyuna geri dönme konusunda rahat değilim.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. İnsanlar sakatlığımın ne kadar ciddi olduğunu anlamıyor	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. Oynamaya hazır mıyım bilmiyorum.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. Oyuna çok erken dönersem sakatlığımın daha da kötüleşeceğinden korkuyorum.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. Ağrım şiddetli olduğunda, sakatlığımın çok ciddi olduğundan endişe ediyorum	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>