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Research Article / Araştırma Makalesi

Development, validity and reliability of the Sports Injury Prevention Awareness Scale

Spor Yaralanmalarından Korunma Farkındalığı Ölçeği geliştirme, geçerlilik ve güvenirlik çalışması

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ABSTRACT

Objective: This study aimed to develop the Sports Injury Prevention Awareness Scale (SIPAS) and to determine its validity and reliability for use with the Turkish population.

Materials and Methods: This methodological study was initiated after approval by the local ethics committee. After a review of the literature, a pool of 31 items was developed. The items were organized into a 5-point Likert-type scale (Scale v.1), and the content validity of this pilot-scale was assessed using the Lawshe method, for which expert opinion was used to determine content validity ratio (CVR) and content validity index (CVI). Subsequently, the pilot-scale was applied to a sample of at least 10 times the number of items. Participants' descriptive information, and responses were recorded electronically (Google Forms). Data were analyzed and the validity and reliability of the scale were assessed using SPSS v.23 and AMOS v.24.

Results: The content validity of the scale (Scale v.1) was assessed using opinions from 18 experts. Items that did not meet the minimum CVR threshold were eliminated (k=2). The remaining 29-item scale (Scale v.2) had a CVI of 0.696 and was applied to a total of 379 participants (147 males, 38.8%; 232 females, 61.2%) with a mean age of 29.2±11.3 years. From Scale v.2, a total of 11 items were removed due to reducing Cronbach's alpha coefficient (k=5), lack of variables (k=1), or cross-loading between factors (k=5). The remaining 18 items (Scale v.3) explained 59.7% of the variance. Analyses revealed four factors with eigenvalues λ>1.0. The reliability of Scale v.3 was demonstrated with a Spearman-Brown reliability coefficient of 0.778, a Guttman split-half reliability coefficient of 0.772, and a Cronbach's alpha reliability coefficient of 0.884. Scale v.3 satisfied the goodness-of-fit indices in confirmatory factor analysis.

Conclusions: The 18-item four-factor (health status, environmental factors and equipment, exercise session, exercise program) Sports Injury Prevention Awareness Scale is valid and reliable for use with Turkish individuals aged 13-66 years.

Keywords: *injuries, prevention, knowledge, awareness*

ÖZ

Amaç: Bu çalışmanın amacı, 'Spor Yaralanmalarından Korunma Farkındalığı Ölçeği'nin geliştirilmesi, Türk toplumunda geçerliliğinin ve güvenirliğinin sağlanmasıdır.

Gereç ve Yöntem: Metodolojik tipteki bu araştırmaya, yerel etik kurul tarafından verilen onaydan sonra başlanmıştır.Alan yazında yapılan tarama sonrasında 31 maddeden oluşan bir madde havuzu oluşturuldu. Maddeler 5'li likert derecelendirme ölçeği (Ölçek v.1) şeklinde düzenlendikten sonra Lawshe yöntemi kullanılarak uzman görüşü alınıp kapsam geçerlilik oranı (KGO) ve kapsam geçerlilik indeksi (KGİ) hesaplanarak pilot ölçeğin kapsam geçerliliği irdelendi.

Kapsam geçerliliği sağlanan pilot ölçek, madde sayısının en az 10 katında bireye uygulandı. Araştırmaya katılan bireylerin tanımlayıcı bilgileri ve ölçeğe verdikleri cevaplar elektronik ortamda (Google Forms) kaydedildi. Verilere, SPSS v.23 paket programı ve AMOS v.24 istatistik programı ile geçerlilik ve güvenirlik analizi yapıldı.

Bulgular: Ölçeğin (Ölçek v.1) kapsam geçerliliği için 18 uzmandan görüş alındı. En düşük KGO değerini karşılamayan maddeler ölçekten çıkartıldı. Ölçeğin KGİ değeri 0.696 bulundu. Pilot uygulamada 29 maddelik Ölçek v.2, ortalama yaşı 29.2±11.3 yıl olan 147 (%38.8) erkek ve 232 (%61.2) kadına uygulandı.

Ölçek v.2'deki beş madde Cronbach alfa katsayısında düşmeye neden olduğu, bir madde değişken yetersizliği oluşturduğu ve beş madde 'binişik madde' özelliği gösterdiği için ölçekten çıkartıldı. Ölçekte kalan 18 madde (Ölçek v.3) toplam %59.7 varyansı açıkladı ve öz değeri 1.0'den büyük olan dört faktörlü yapı oluşturdu. Ölçeğin (v.3) güvenirliği; Spearman-Brown güvenirlik katsayısı 0.778, Guttman Split Half güvenirlik katsayısı 0.772 ve Cronbach Alfa güvenirlik katsayısı 0.884 bulunarak gösterildi. Ölçek v.3, doğrulayıcı faktör analizinde modele ilişkin uyum indekslerini sağladı.

Sonuç: Geliştirilen 'Spor Yaralanmalarından Korunma Farkındalığı Ölçeği', 18 madde ve dört (kişisel sağlık durumu, çevresel faktörler ve ekipman, egzersiz seansı, egzersiz programı) faktörlü yapı ile 13-66 yaş aralığındaki Türk toplumunda geçerliliğini ve güvenirliğini sağladı.

Anahtar Sözcükler: *Spor yaralanmaları, korunma, bilgi, farkındalık*

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INTRODUCTION

Physical activity and exercise have well-established health benefits and are recommended by the World Health Organization for individuals of all ages (1-3). Physical activity of any frequency and type contributes to the cardiorespiratory system, cardiometabolic system (blood pressure, dyslipidemia, glucose, insulin, etc.), motor control, physical fitness, bone health, adiposity, diabetes, cancer prevention, mental health, cognitive functions, social behavior, and sleep (1,3,4). On the other hand, physical activity participation may have certain adverse effects (4,5), including musculoskeletal injuries, as well as dehydration and heatstroke (6).

Data from epidemiological studies indicate that 60% of all injuries treated in Scandinavian medical facilities were sports-related. Moreover, 30% of all pediatric sports injuries require medical care (4). In the United States, 11% of emergency admissions were due to sport and active recreation-related injuries (4). On the other hand, more and more studies investigate approaches for sports injury prevention, and offer suggestions for reducing sports injuries (4,7-10) since physical activity participation is associated with substantial personal and social benefits (1,11,12).

The frequency and severity of sports injuries can be reduced provided that necessary measures are taken (5,13,14). The numerous proposed theories and models prominently recommend developing knowledge and awareness in the society (15-17). Given the contribution of physical activity to well-being (1-3), efforts should focus on encouraging participation in physical activity and increasing awareness regarding adoption of sports injury prevention methods.

There is a need for tools that can be used for the measurement and assessment of sports injury prevention awareness. This study aimed to develop the Sports Injury Prevention Awareness Scale and to determine its validity and reliability for use with the Turkish population.

MATERIALS and METHODS

This methodological study was initiated after approval by the local ethics committee. Informed consent was obtained from all participants. We constructed our scale following the steps described in the literature, including literature review, creating an item pool, expert review, and pilot testing (18).

Review of the literature did not reveal a sports injury prevention awareness measurement tool. Subsequently, a pool of 31 items that would be understandable by Turkish individuals was created. The items were organized into a 5-point Likert-type scale (Scale v.1), and the content validity of this pilot-scale was assessed using the Lawshe method (19).Accordingly, expert opinion was obtained between October and November 2020 to determine the fitness of each item to measure the relevant domain. Quantitative data from experts were analyzed, and content validity ratio (CVR) and the content validity index (CVI) were calculated (19). After achieving content validity, Scale v.2 was developed for a pilot application.

The pilot study was applied to a sample of at least 10 times the number of items (20). The study included people living in Turkey aged >12 years who were literate in Turkish, and who could give reliable answers to the survey. Participants' descriptive information, and responses were recorded electronically (Google Forms).

Statistical Analysis

Data were analyzed using SPSS v.23 and AMOS v.24. Participants' descriptive characteristics were analyzed using frequencies, percentages, and means. For validity and reliability studies, the suitability of the sample for analysis was evaluated with the Kaiser-Meyer-Olkin (KMO) measure of sample adequacy and Bartlett's test of sphericity. The scale was then assessed with item analysis, item-to-total correlation, Cronbach's α, split-half method, and exploratory and confirmatory factor analysis.

RESULTS

Content validity

Content validity was assessed using the opinions of 18 experts (five Sports Medicine, three Orthopedics and Traumatology, three Physiotherapy and Rehabilitation, two Public Health, two Sports Science, one Family Medicine, one Pediatrics, one Biostatistics), all of whom held at least the rank of assistant professor. A language expert examined the grammar of the scale items. According to the number of experts, the CVR threshold was determined as 0.444. From the 31-item Scale v.1, two items that did not meet the minimum CVR threshold were removed, and three items were revised. The subsequent 29-item Scale v.2 had a CVI of 0.696 and was content-valid (19).

Pilot study and participants' descriptive characteristics

Scale v.2 was applied to a total of 379 participants (147 males, 38.8%; 232 females, 61.2%) with a mean age of 29.2±11.3 years. The mean body-mass index was 24.1±4.5 kg/m^2. Among the participants, 7.1% (n=27) had completed primary education and 18.7% (n=71) secondary education, 64.4% (n=244) had received post-secondary education, and

9.8% (n=37) had a master's degree or doctorate. About 13.5% (n=51) of the participants reported having a known chronic disease, 76.5% (n=39) of which regularly used medication for their condition. Nearly 52.5% (n=199) of the participants reported having participated in physical activity at some point in their lives and 18.2% (n=69) had a history of sports injury.

Reliability and construct validity

From Scale v.2, five items were removed due to reducing Cronbach's alpha coefficient and one due to lack of variables. Item score averages were similar. There were no items with a standard deviation of zero or an item-to-total correlation coefficient below 0.25 (19). All items had positive discrimination indices (19), and were statistically significant in the independent samples t-test ($p<0.001$). Scale results were not affected by a ceiling (1.6%) or floor effect (0.3%).

The KMO measure of sampling adequacy was 0.884, and Bartlett's test of sphericity was highly significant ($x2=2789,709$, $p<0.001$). Anti-image correlation results were >0.50 for all items. Construct validity was assessed by the principal components method of exploratory factor analysis. The scree plot revealed a four-factor model with eigenvalues (λ) of ≥1.00 (Figure 1). For factor rotation, the oblimin rotation method, an oblique rotation technique was performed. Five items were removed from the scale due to cross-loading between factors.

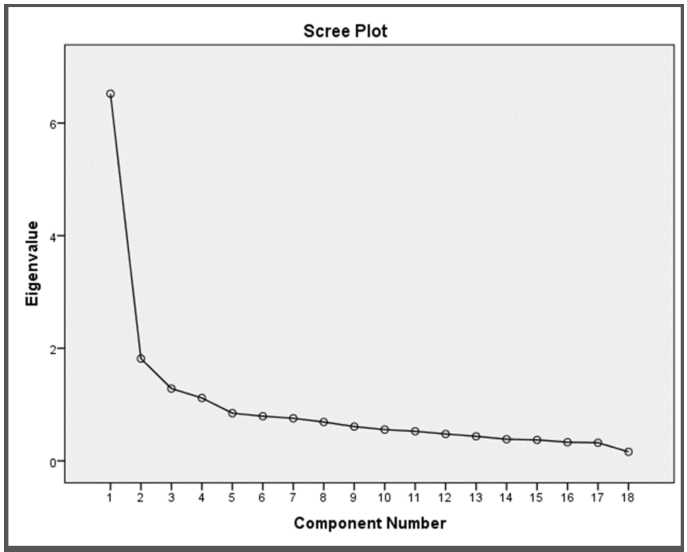

Figure 1. Scree plot graphic of the scale

The remaining 18 items (Scale v.3) explained 59.7% of the variance. Analyses revealed four factors with eigenvalues λ>1.0: health status (λ=6.52, explained 36.2% of the variance), environmental factors and equipment (λ=1.82, explained 10.1% of the variance), exercise session (λ=1.28, explained 7.1% of the variance), and exercise program (λ 1.12, explained 6.2% of the variance). For each item, the average score, item-to-total correlation, discrimination indices, factor loadings, and rotated factor loadings are presented in Table 1.

Table 1. Factor- and item-related evaluation of the scale

	v.2 items	v.3 items	Mean	Standart deviation	Item-total correlation	Item discrimination strength index	Factor load	Rotated factor load
Factor 1	2	1	4.60	0.627	0.848	10.052	0.405	0.450
	6	2	4.57	0.542	0.921	12.337	0.594	0.581
	5	3	4.45	0.709	0.844	8.173	0.431	0.847
	7	4	4.43	0.700	0.875	10.804	0.598	0.604
	10	5	4.55	0.630	0.879	13.285	0.650	0.845
Factor 2	11	6	4.61	0.540	0.919	15.146	0.650	0.735
	13	7	4.58	0.564	0.928	13.714	0.714	0.636
	14	8	4.59	0.595	0.903	14.555	0.655	0.798
	17	9	4.37	0.683	0.905	14.341	0.704	0.485
Factor 3	20	10	3.88	0.818	0.842	11.877	0.473	0.786
	21	11	3.95	0.824	0.832	11.817	0.488	0.843
	22	12	4.12	0.714	0.881	14.496	0.603	0.715
	27	13	4.08	0.866	0.908	13.391	0.508	0.457
Factor 4	16	14	3.68	0.895	0.915	11.192	0.430	0.574
	25	15	4.46	0.639	0.940	13.068	0.607	0.758
	23	16	4.46	0.596	0.832	16.159	0.744	0.858
	24	17	4.47	0.618	0.824	14.595	0.714	0.912
	28	18	4.41	0.603	0.923	16.968	0.692	0.716

The reliability of Scale v.3 was demonstrated with a Spearman-Brown reliability coefficient of 0.778, a Guttman split-half reliability coefficient of 0.772, and a Cronbach's alpha reliability coefficient of 0.884. The reliability of all four factors of the scale was calculated and presented in Table 2.

Based on a favorable exploratory factor analysis, confirmatory factor analysis was performed, and the model's goodness-of-fit was assessed (21), which indicated a good model-data fit. Goodness-of-fit results from confirmatory factor analysis are presented in Table 3 and the path diagram is presented in Figure 2.

Table 2. Results regarding the reliability of the scale

Factors	Item numbers	Spearman-Brown coefficient	Guttman split- half coefficient	Cronbach alfa
Factor 1	4	0.740	0.740	0.692
Factor 2	5	0.850	0.826	0.837
Factor 3	5	0.676	0.647	0.754
Factor 4	4	0.803	0.801	0.846
Scale	18	0.778	0.772	0.884

Table 3. Results of confirmatory factor analysis of the scale

Model fit indices (21)	Good fit	Acceptable fit	Scale's value
Chi-square (χ^2)			344.755
p value	0.05<p≤1.00	0.001<p≤0.05	0.001
Degrees of freedom (df)			130
χ^2/df	0≤χ2/sd≤2.00	2.00<χ2/sd≤3.00	2.652
Root mean square error of approximation (RMSEA)	0≤RMSEA≤0.05	0.05<RMSEA≤1.00	0.066
Standardized root mean square residual (SRMR)	0≤SRMR≤0.05	0.05<SRMR≤1.00	0.027
Comparative fit index (CFI)	0.95≤CFI≤1.00	0.90≤CFI<0.95	0.920
Goodness-of-fit index (GFI)	0.95≤GFI≤1.00	0.90≤GFI<0.95	0.909
Adjusted goodness-of-fit index (AGFI)	0.90≤AGFI≤1.00	0.85≤AGFI<0.90	0.881
Incremental fit index (IFI)	0.95≤IFI≤1.00	0.90≤IFI<0.95	0.921
Turker-Lewis index (TLI)	0.95≤TLI≤1.00	0.90≤TLI<0.95 (veya TLI>0.80)	0.906

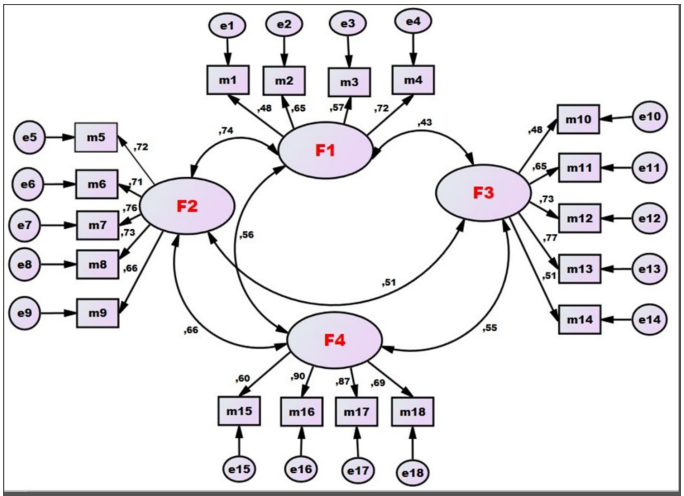

Figure 2. Confirmatory factor analysis diagram of the scale

DISCUSSION

In this study, we developed the 18-item Sports Injury Prevention Awareness Scale (SIPAS) (Appendix 1). The scale is found to be valid and reliable to assess sports injury prevention awareness in Turkish individuals aged 13-66 years under four domains: health status (items 1-4), environmental factors and equipment (items 5-9), exercise session (items 10-14), and exercise program (items 15-18). The scale does not contain any reverse-scored items, and the total score is calculated by summing the ratings of each item. A higher score indicates better sports injury prevention knowledge and awareness.

Review of the literature did not reveal a tool for the measurement of sports injury prevention knowledge and awareness. Accordingly, we aimed to develop a scale based on the knowledge available in the current literature. We first created an item pool (18) and subsequently assessed content validity using expert opinion.

The Lawshe method, which involves referring to expert opinion, is commonly used to confirm content validity. This method involves analyzing quantitative data from experts to calculate content validity ratio (CVR) and content validity index (CVI) in order to develop a pilot-scale (19). According to the number of experts consulted for our pilot-scale; it was observed that the pilot scale form provided the smallest CVR of 0.42 and CVI value suggested to be greater than 0.67 (19). Therefore, SIPAS was determined to be content-valid.

After confirming content validity, the literature recommends the pilot-scale to be applied to a sample of at least 10 times the number of items (20). We accordingly aimed to include at least 10 times the number of items in SIPAS. Since SIPAS is based on the summation of individual items' scores, the reliability of the scale was examined by item analysis (19). The average scores of the items were similar and there were no items with a standard deviation of zero. Moreover, there were no items with an item-to-total correlation coefficient below 0.25. If removing a specific item from the scale results in increased overall reliability, that item is called an "unreliable item" and should be eliminated (19). In the present study, five items were removed from Scale v.2 due to decreasing the Cronbach's alpha coefficient. Further analyses indicated that the final version (Scale v.3) did not contain any "unreliable" items.

High discrimination power requires a statistically significant ($p<0.05$) difference between the mean scores of participants who got the item right and those who got the item wrong, and a non-negative t-value (19). All items of SIPAS met these criteria. The literature indicates that the proporti-

on of participants that scored maximum or minimum should not exceed 5-20%. If a higher proportion of subjects scored maximum or minimum, this results in a ceiling or a floor effect, in other words, it is not possible to discriminate between the top or bottom end of the scale (19). For SIPAS, 1.6% of the participants scored the maximum possible score and 0.3% scored the minimum possible score, indicating no ceiling or floor effect.

Construct validity was assessed by factor analysis (19). The KMO measure of sampling adequacy was 0.884 for SIPAS, indicating very good sampling adequacy (20). Bartlett's test of sphericity is used to determine whether the correlation matrix is an identity matrix and whether the data are statistically significant with the value of the test statistic. For SIPAS, Bartlett's test of sphericity was significant ($p<0.05$) (19,20). Items with anti-image correlation matrices below 0.05 must be removed from a given scale (19). All items of SIPAS had anti-image correlation results >0.50. Therefore, the scale was suitable for factor analysis.

There are several different factor extraction methods for factor analysis, and the most used one is the principal components method. This method focuses on factors that will explain the highest variance in all variables (20). To be included in the model, each factor must have an eigenvalue greater than 1.0 and account for at least 5% of the total variance (19,20). The number of components to be retained in the model can also be determined with a scree plot (18,19). A model that can explain 50-70% of total variance is accepted as adequate (19). In reference to the literature and our analyses, we determined that our scale adequately measured sports injury prevention awareness under four domains.

Unrotated factor loadings obtained with the principal components method may be insufficient for factor analysis, which can be overcome by factor rotation. Oblique rotation methods (such as direct oblimin or promax) are often preferred when the factor correlation coefficient is ≥0.32 (19). In reference to the literature, we performed the oblimin rotation method for factor rotation. After factor rotation, all rotated factor loadings of the model were above 0.40. However, fiveitems were removed from the scale due to cross-loading between factors.

Reliability and construct validity analyses were repeated for the final version of SIPAS (Scale v.3) using Cronbach's alpha reliability coefficient, Spearman-Brown reliability formula, and Guttman split-half reliability formula (19). The final 18-item version of SIPAS was determined to be reliable.

Confirmatory factor analysis, a type of factor analysis, is being increasingly used in research. This method allows testing internal consistency and helps to reveal accuracy and causality and determines whether items belong to the same domain or factor. The goodness and fitness of the proposed model are determined with fitness indices in confirmatory factor analysis (18). SIPAS met all recommended goodness-of-fit criteria (21), thus confirming the study hypothesis.

As to limitations, the study excluded individuals aged below 12 years, individuals illiterate in Turkish, and individuals who did not have the capacity to communicate sufficiently to give reliable answers to the scale.

To conclude, SIPAS is an 18-item four-factor (health status, environmental factors and equipment, exercise session, exercise program) scale that is valid and reliable for use with Turkish individuals aged 13-66 years. SIPAS can be used in scientific studies to measure sports injury prevention knowledge and awareness, and to measure objective progress after education programs.

Conflict of Interest / Çıkar Çatışması

The authors declared no conflicts of interest with respect to authorship and/or publication of the article.

Financial Disclosure / Finansal Destek

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Appendix 1. Turkish version of The Valid and Reliable Sports Injury Prevention Awareness Scale

Spor Yaralanmalarından Korunma Farkındalığı Ölçeği

Bu ölçek, spor yaralanmalarından korunma farkındalığınızı ölçmek için hazırlanmıştır. Aşağıda yer alan her bir ifadeyi dikkatle okuyunuz.

Aşağıda yer alan her bir ifadeyi okuduktan sonra, ifadenin spor yaralanmalarından koruyuculuğu konusundaki düşüncenizi **1'den 5'e kadar** bir sayı ile belirtiniz.

1. Kesinlikle katılmıyorum
2. Katılmıyorum
3. Ne katılıyorum ne katılmıyorum (kararsızım)
4. Katılıyorum
5. Kesinlikle katılıyorum

		1	2	3	4	5
1	Spor yaralanmalarından korunmak için kişi yapacağı egzersizi mevcut sağlık durumuna göre planlamalıdır					
2	Egzersize başlarken, daha önce geçirilmiş olan yaralanmalar spor yaralanmalarından korunmak için dikkate alınmalıdır					
3	Egzersiz yaparken göğüs ağrısı, çarpıntı, bayılma vb. gibi durumların yaşanması halinde spor yaralanmalarından korunmak için egzersize ara verilmelidir					
4	Egzersiz yaparken şiddetli ağrı hissedildiğinde spor yaralanmalarından korunmak için egzersize ara verilmelidir					
5	Spor yaralanmalarından korunmak için yapılacak egzersiz tipine göre ayakkabı giyilmelidir					
6	Yapılacak egzersize özgü koruyucu ekipman (varsa) spor yaralanmalarından korunmak için kullanılmalıdır					
7	Egzersiz sırasında kullanılan ekipmanlar spor yaralanmalarından korunmak için kişiye uygun olmalıdır					
8	Spor yaralanmalarından korunmak için egzersiz yapılan zemine göre ayakkabı giyilmelidir					
9	Spor yaralanmalarından korunmak için egzersizin yapılacağı hava şartlarının sıcak ya da soğuk olmasına göre önlem alınmalıdır					
10	Spor yaralanmalarından korunmak için egzersiz programında kardiyovasküler dayanıklılığı arttırıcı egzersiz tipi olmalıdır					
11	Spor yaralanmalarından korunmak için egzersiz programında kas kuvvetini arttırıcı egzersiz tipi olmalıdır					
12	Spor yaralanmalarından korunmak için egzersiz programına denge egzersizleri eklenmelidir					
13	Egzersizi bitirirken spor yaralanmalarından korunmak için soğuma egzersizleri yapılmalıdır					
14	Spor yaralanmalarından korunmak için egzersiz sonrasında su içilmelidir					
15	Egzersize yeni başlayacak kişi spor yaralanmalarından korunmak için egzersiz programına düşük seviyeden başlamalıdır					
16	Egzersiz süresini arttırırken spor yaralanmalarından korunmak için kademeli artış yapılmalıdır					
17	Egzersiz şiddetini (zorluğunu) arttırırken spor yaralanmalarından korunmak için kademeli artış yapılmalıdır					
18	Egzersiz sıklığını günlük ya da haftalık arttırırken spor yaralanmalarından korunmak için kademeli artış yapılmalıdır					

Açıklama: Ölçekte; 'kişisel sağlık durumu alt boyutu' 1-4. maddeler, 'çevresel faktörler ve ekipman alt boyutu' 5-9. maddeler, 'egzersiz seansı alt boyutu' 10-14. maddeler ve 'egzersiz programı alt boyutu' ise 15-18. maddeler ile irdelenmektedir.

Ölçekte ters soru yoktur. Ölçeği cevaplayan kişilerin verdikleri puanlar toplanarak ölçek toplam puanı hesaplanmaktadır. Ölçeğin kişisel sağlık durumu alt boyutundan en az 4, en fazla 20 puan; çevresel faktörler ve ekipman alt boyutundan en az 5, en fazla 25 puan; egzersiz seansı alt boyutundan en az 5, en fazla 25 puan; egzersiz programı alt boyutundan en az 4, en fazla 20 puan ve ölçekten toplamda en az 18, en fazla 90 puan alınabilmektedir. Alınan puanın yükselmesi, spor yaralanmalarından korunma bilgisinin yüksek olduğunu ifade etmektedir.

Appendix 2. English translation of The Valid and Reliable Sports Injury Prevention Awareness Scale

Sports Injury Prevention Awareness Scale

This scale was designed to measure your awareness of sports injury prevention. Please read each statement carefully.

Please grade each item **from 1 to 5** by marking one box per row, depending on your opinion regarding the statement.

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree (Undecided)
4. Agree
5. Strongly agree

		1	2	3	4	5
1	To prevent sports injuries, exercise should be planned depending on the current health status of each individual.					
2	To prevent sports injuries, previous injuries should be taken into consideration before starting exercise.					
3	To prevent sports injuries, if chest pain, palpitations, fainting, etc. occurs during exercise, the exercise should be stopped.					
4	To prevent sports injuries, in case of severe pain during exercise, the exercise should be stopped.					
5	To prevent sports injuries, shoes should be chosen according to the kind of sports.					
6	To prevent sports injuries, exercise-specific protective equipment should be used (if any).					
7	To prevent sports injuries, only adequate equipment should be used during exercise.					
8	To prevent sports injuries, shoes should be chosen according to the floor.					
9	To prevent sports injuries, equipment and clothing should be adjusted according to weather.					
10	To prevent sports injuries, cardiovascular endurance exercises should be included in the exercise program.					
11	To prevent sports injuries, strength exercises should be included in the exercise program.					
12	To prevent sports injuries, balance exercises should be included in the exercise program.					
13	To prevent sports injuries, post-exercise stretching should be included in the exercise program.					
14	To prevent sports injuries, staying hydrated is important.					
15	To prevent sports injuries, beginners should start with light exercises.					
16	To prevent sports injuries, exercise duration should be increased gradually.					
17	To prevent sports injuries, exercise intensity (difficulty) should be increased gradually.					
18	To prevent sports injuries, exercise frequency should be increased gradually.					

Explanation: Items 1–4 measure the health status domain, items 5–9 the environmental factors and equipment domain, items 10–14 the exercise session domain, and items 15–18 the exercise program domain.

The scale does not contain any reverse-scored items. The total score is calculated by summing the ratings of each item. The health status domain is scored between 4 and 20 points, the environmental factors and equipment domain between 5 and 25 points, the exercise session domain between 5 and 25 points, and the exercise program domain between 4 and 20 points. The overall scale is scored between 18 and 90 points. A higher score indicates better sports injury prevention knowledge and awareness.