International Journal of Innovative Research and Scientific Studies, 8(2) 2025, pages: 3977-3984

IJIRSS
International Journal of Innovative Research & Scientific Studies

ISSN: 2617-6548

URL: www.ijirss.com

Arabic translation and cultural adaptation of a characteristics of resilience in sports teams inventory questionnaire: A cognitive interview study

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Abstract

This paper aims to enhance athlete well-being, training, and team performance by translating and culturally adapting a validated version of the Characteristics of Resilience in Sports Teams Inventory (CREST) for Arabic-speaking teams. This study used a convenience sample of 16 Arabic-speaking coaches (mean age: 41.81 years; experience: 12.44 years) and followed a structured cross-cultural adaptation process, including cognitive interviews, forward translation, synthesis, back-translation, and expert review. Cognitive interviews were conducted in three rounds. Participant characteristics were summarized using descriptive statistics, with continuous variables reported as means and standard deviations and categorical variables as frequencies and percentages. The translation and cultural adjustment of the questionnaire into Arabic incorporated slight language revisions recommended by the panel of experts. Participants unanimously agreed that the resulting Arabic version of the Characteristics of Resilience in Sports Teams Inventory (CREST) was culturally suitable and clearly expressed the original meaning of each questionnaire item. After its successful translation and cultural adaptation into Arabic, the CREST was ready for use in the Arabic context. This development opens opportunities for extensive research and tailored performance optimization strategies, potentially enhancing player welfare and development within Arabic-speaking sports communities.

Keywords: Adversity, sports psychology, team performance, team resilience.

DOI: 10.53894/ijirss.v8i2.6196
Funding: This research is supported by the Deanship of Scientific Research at King Faisal University, Saudi Arabia, (Grant Number: KFU251346).
History: Received: 26 February 2025 / **Revised:** 31 March 2025 / **Accepted:** 2 April 2025 / **Published:** 14 April 2025
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Competing Interests: The author declares that there are no conflicts of interests regarding the publication of this paper.
Transparency: The author confirms that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.
Institutional Review Board Statement: The Ethical Committee of the [Scientific Research Ethics Committee at King Faisal University, Saudi Arabia has granted approval for this study (Ref. protocol No ETHICS2962).
Publisher: Innovative Research Publishing

1. Introduction

An adverse situation, defined as an event that may lead an individual to experience maladjustment, is an unavoidable aspect of many team environments, including sports [1]. Teams regularly face challenges, setbacks, or stressful situations that can impair their ability to perform optimally [2, 3]. These stressful circumstances can impact both individual and team performance, and they are particularly prevalent in high-stakes events where the pursuit of success is relentless [4, 5]. Both theoretical and empirical studies indicate that a variety of factors influence team performance and effectiveness [6, 7], with team resilience being recognized as one of the most significant contributors [8, 9].

Recent studies have emphasized the importance of team resilience in sports, focusing on how teams can collectively endure pressure while maintaining high performance [10-12]. Team resilience, as described by Alliger et al. [13], is "…the capacity of a team to withstand and overcome stressors in a manner that enables sustained performance; it helps teams handle and recover from challenges that could threaten their cohesion and performance" (p. 177). To further advance the field, scholars have suggested developing resilience metrics tailored to specific sports and incorporating advanced qualitative techniques and statistical modelling [14]. A comprehensive understanding of team resilience is essential for teams to effectively utilize their collective psychosocial resources [15].

Although resilience significantly influences sports performance, limited instruments exist that specifically measure resilience within sports teams. To address this limitation, [16] developed the Characteristics of Resilience in Sports Teams Inventory (CREST), based upon [8] theoretical framework. The inventory includes two primary dimensions that evaluate a team's capability to handle stress-related vulnerabilities (VNP) and their capacity to exhibit resilience characteristics (DRC). Team resilience is assessed through four distinct components: mastery approach, group structure, collective efficacy, and social capital. The inventory features 20 items, each scored using a Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). Of these, 12 items positively reflect resilience, while the remaining eight negatively indicate vulnerabilities under stressful conditions. Evidence suggests the CREST questionnaire evaluates resilience through team-based psychosocial mechanisms, rather than focusing on individual athlete characteristics. The validity and reliability of this instrument have been confirmed in samples from Spain, China, and Turkey [17-19].

Research examining resilience in teams, specifically within Saudi Arabia, remains scarce. Gucciardi et al. [20] have highlighted that differences between Eastern and Western cultures may limit the general applicability of resilience measures, and Ungar [21] emphasized incorporating cultural elements into resilience research. Therefore, this study aimed to produce an Arabic translation and cultural adaptation of the CREST instrument, specifically for application within Arab contexts. This culturally adapted questionnaire will support future research through the creation of representative samples and facilitate comparative studies across different countries.

2. Methods

This study utilized a structured cross-sectional design, with participants recruited through convenience sampling, resulting in a total of 16 Arab coaches aged over 26 years, representing various Arab countries. Efforts were made to ensure diverse national representation across the Arab region. Initial coordination involved contacting team management to secure approval and arrange interviews with the coaches. Additionally, coaches working in Saudi Arabia were invited to join the study. Coaches lacking Arabic fluency were not included. Institutional ethical approval for this study was granted by King Faisal University's Institutional Review Board (IRB), Al-Ahsa, Saudi Arabia (IRP: ETHICS2962). Each participant signed informed consent before their involvement in the study.

2.1. Measure (Instrument)

The current study outlines the procedure undertaken to translate and culturally adapt the Characteristics of Resilience in Sports Teams Inventory (CREST), originally developed by Decroos et al. [16] for Arabic-speaking athletes. The CREST questionnaire includes 20 items designed to measure resilience in sports teams through two distinct sub-scales: one assessing how effectively a team exhibits resilience characteristics (e.g., “the team was able to concentrate on important matters”), and another addressing how teams reveal vulnerabilities when under stress (e.g., “team members began communicating negatively with one another”). Responses were recorded on a seven-point Likert-type scale, ranging from 1 (strongly disagree) to 7 (strongly agree). The multilingual version of the CREST questionnaire has been previously validated for reliability in assessing team resilience [17-19].

2.2. Cross-Cultural Adaptation Process

The adaptation procedure in this study adhered to established cross-cultural guidelines proposed by Beaton et al. [22], which have also been successfully applied in earlier research [23, 24]. The steps of the adaptation process used are presented in Figure 1.

2.2.1. Forward Translation

The initial translation from English to Arabic was performed by two bilingual translators fluent in both languages and selected for their impartiality. Translator 1 was familiar with the questionnaire's subject matter, while Translator 2 was deliberately uninformed to maintain objectivity and reduce bias. This approach followed [22] guidelines to ensure impartiality during translation.

2.2.2. Synthesis of the Translation

To finalize the T12 questionnaire, the author thoroughly reviewed the initial translated version, identifying and addressing any discrepancies. Afterward, the collaboration between the author and translators resulted in the creation of the final version of the questionnaire, forming a consensus-based document.

2.2.3. Back Translation

Independent bilingual translators completed the back-translation procedure. Without prior knowledge of the original questionnaire, the T12 was retranslated from Arabic to English. This step was designed to ensure accurate, unbiased, and comprehensible translation. The primary aim was to detect any subtle variations in item formulation and to confirm the consistency of the translated questionnaire.

2.2.4. Expert Committee

An expert panel was assembled, comprising four specialists with substantial experience in sports science and translation methods, including those involved in both forward and back translations. Each expert held a doctoral degree, possessed bilingual proficiency in Arabic and English, and had extensive experience in areas such as languages, coaching, sports science, and exercise psychology. The expert panel played a critical role in verifying the cultural appropriateness and accuracy of the adapted research instruments. All versions of the questionnaire, including the initial questionnaire, forward and back translations, and the evaluations provided by the author, were thoroughly assessed by each panel member. Their feedback was essential to ensure consistency and equivalence between the translated versions of the questionnaire [22].

2.2.5. Pre-Testing Version

The questionnaires were completed by fourteen native Arabic-speaking coaches from various team sports, including football, volleyball, and handball, aged between twenty-six and sixty-five. They also participated in cognitive interviews to assess their interpretation of each item on the questionnaire and the responses they provided. The pre-testing phase aimed to evaluate the pre-final version in the relevant context.

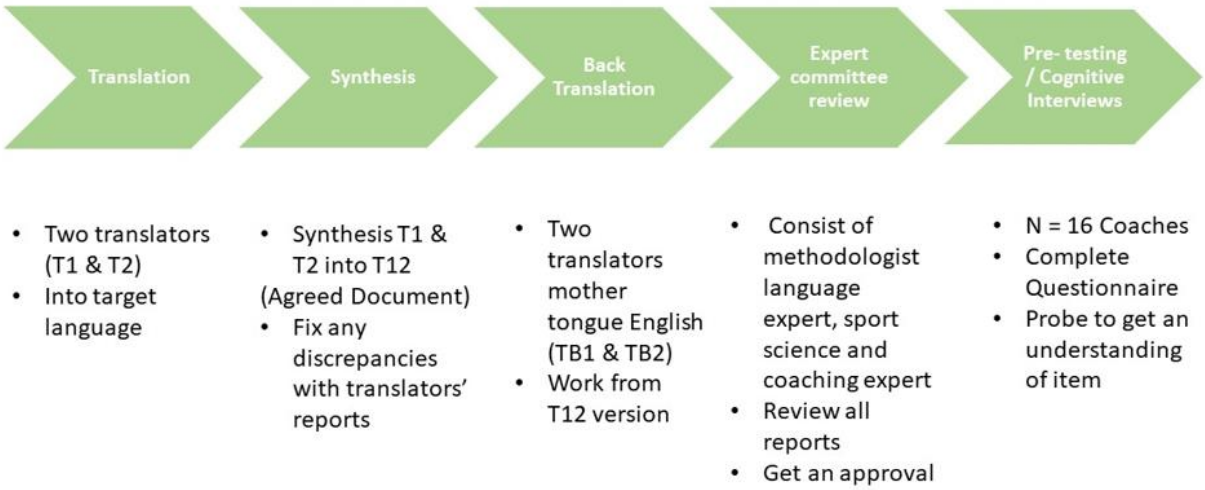

Figure 1.
Cross-Cultural Adaptation Process.

2.3. Cognitive Interviews

According to Willis [25], cognitive interviewing is a qualitative approach designed to evaluate if survey questions accurately convey their intended meaning. Prior to conducting these interviews, participants were asked to complete the final Arabic-adapted questionnaire, either online via Zoom or through face-to-face meetings. Three rounds of cognitive interviews were held, with five participants taking part in each of the first two rounds, and six participants in the third round (see Table 1). These interviews aimed to confirm participants' clear understanding of each questionnaire item and to identify any phrases needing clarification or adjustment. Interview questions followed a semi-structured and open-ended format, with responses recorded in Arabic. The author conducted each interview and recorded response times. After each round, interview questions were revised based on participant suggestions. The cognitive interviews included the following questions:

1. "What do you think the question is about?"
2. "Is the question clear and understandable? If not, how could it be made clearer?"
3. "Do you have any questions about the items?"
4. "How could the wording be clearer?"

2.4. Statistical Analysis

Descriptive statistics were conducted, with continuous data summarized using means and standard deviations (SD). The overall cognitive interview score was determined by taking the total number of answers provided for each cognitive interview

question, multiplying it by 100, and then dividing by the overall number of responses. The percentage of responses without comprehension issues was also calculated. All statistical analyses were performed using SPSS (version 27, IBM Corp.).

Table 1.
Summary of the participants' population characteristics (n=16).

Variables	R1 (n = 5)	R2 (n = 5)	R3 (n = 6)
	Mean ± SD		
Age (Years)	34.6 ± 6.9	46.8 ± 7.6	43.6 ± 8.7
Experience (Years)	8.2	11.6	16.6
Sports			
Football	2	4	3
Basketball	1		3
Volleyball	1		
Handball	1	1	
Education			
Postgraduate Degree	2	1	4
College Degree	3	3	1
High School		1	1
Employment Status			
Part-time Coach	3	3	3
Fall-time Coach	2	2	3
Nationality			
Saudi	3	4	2
Egyptian	1	1	2
Tunisian	1		1
Jordanian	1		1

R = round, SD = Standard deviation

3. Results

3.1. Cross-Cultural Adaptation

Forward translation and synthesis: The survey was initially translated into Arabic by two highly skilled bilingual translators. During translation, certain English expressions required adaptation into Arabic, resulting in minor structural differences. These differences were effectively addressed by the author in collaboration with the translators, who clarified the underlying meaning and objectives of the survey. This collaborative revision produced the final agreed-upon Arabic version (T12) of the questionnaire.

Backward translation: Two separate bilingual translators independently translated the T12 version from Arabic back into English. Minor discrepancies in synonyms and sentence structure were identified due to the original lengthy English expressions. These were corrected, ensuring the accuracy and validity of the questionnaire.

Expert committee: Along with the author's written reports, the four experts carefully reviewed both the original and translated surveys. They provided guidance on appropriate cultural adjustments to ensure the questionnaire items aligned with the Arab region. The expert panel suggested several minor adjustments to better fit Arabic culture. For example, the phrase "When you are part of more than one team" was changed to "When you are a member of more than one team."

3.2. Cognitive Interview

Sixteen coaches (48% female; 52% male) from various team sports, such as football, volleyball, basketball, and handball, participated in the cognitive interviews. These coaches were native Arabic speakers from countries including Saudi Arabia, Egypt, Tunisia, and Jordan, with ages ranging from 26 to 56 years (see Table 1). Five participants took part in each of the first two rounds of cognitive evaluations, while six participated in the third round, which made up the interviews. Table 2 presents a detailed analysis of the results from these Arabic-language cognitive interviews. The intended meanings of the questionnaire items were clearly understood by all participants across all three rounds, resulting in a 100% comprehension rate.

Table 2.
Overall results of the cognitive interview of the Characteristics of Resilience in Sports Teams Inventory (CREST).

Round	Participant Understanding of the Intended Meaning	The Content Was clear for the Participant	The Wording Was Clear for the Participant
R1	100%	100%	100%
R2	100%	100%	100%
R3	100%	100%	100%

4. Discussion

The majority of tools used to assess team resilience were developed in English-speaking countries [16, 26-29]. Due to linguistic and cultural barriers, these instruments are typically only applicable to English-speaking populations, excluding Arab researchers and athletes from participation. To address this issue and promote the involvement of Arab researchers and athletes, this study aimed to translate the CREST questionnaire into Arabic for use in Arab nations, while also adapting it to account for cultural differences.

To ensure equivalency between the versions, both the original and translated questionnaires were subject to translation and cultural adaptation [22]. The CREST questionnaire has already been used by various cultural groups and translated into multiple languages, including Turkish, Spanish, and Chinese [17-19]. Developed by Decroos et al. [16], the CREST questionnaire assesses team resilience in sports, focusing on two key dimensions: the team's ability to handle vulnerabilities under pressure (VNP) and its capacity to demonstrate resilient characteristics (DRC). This approach aids in understanding the team's current state, fostering resilience, and enabling the group to manage stress while promoting strong team dynamics. For those in the field of sports psychology, such questionnaires offer valuable insights and practical tools.

In all three rounds of this study, all participants achieved a 100% understanding rate, indicating that they comprehended each item of the questionnaire and its meaning. Similar methodologies have been employed in other studies [23, 24]. For example, Bursais [24] carried out the translation and cultural adaptation of the training load and player monitoring questionnaire for high-level football, ensuring its relevance to the Arabic context. After three rounds of cognitive interviews, participants confirmed that the final Arabic versions were suitable and accurately conveyed the intended meaning of each item. Moreover, Bursais [24] concluded that the revised version was correctly translated into Arabic and culturally adapted to fit the Arabic context.

A key strength of this study is the translation and validation of a questionnaire that assesses team resilience in sports for Arabic-speaking practitioners. Additionally, this study utilized diverse discourses, backgrounds, and demographics to support its findings. A limitation of this study is the lack of an evaluation of the Arabic questionnaire's reliability, which will be addressed in future research. Given the significant presence of football and other sports in the Middle East [30, 31], as well as football's role in promoting social inclusivity [32], having a valid Arabic version of the questionnaire is essential for research involving Arabic-speaking practitioners in these countries. In conclusion, the results confirm that the Arabic translation of the final version of the CREST questionnaire was successful and appropriately adapted to the cultural context of Arabic-speaking communities.

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Supplementary Materials
Appendix A.

استبيان قياس مرونة الفريق

تشير كلمة "الفريق" المستخدمة في معظم الأسئلة إلى جميع الأفراد المشاركين مثل اللاعبين والمدربين ومدراء الفرق. فعندما تكون عضو في أكثر من فريق واحد، يُرجى الإجابة عن الفريق الذي شاركت معه بشكل أكبر خلال الشهر الماضي.

تصف العبارات التالية بعض الصفات التي قد تُظهرها الفرق الرياضية عندما تواجه ضغوطًا. يُرجى وضع في الاعتبار تلك اللحظات التي كان فيها فريقك تحت الضغط خلال الشهر الماضي والإشارة إلى مدى موافقتك أو عدم موافقتك مع العبارات التالية.:

(1) يعني "لا أوافق بشدة"، (7) يعني "أوافق بشدة."

	في الشهر الماضي، عندما كان فريقي تحت الضغط..	لا أوافق بشدة			محايد			أوافق بشدة
1	استطاع الفريق أن يركز على ما هو هام	1	2	3	4	5	6	7
2	بدأ الأعضاء بالتواصل بشكل سلبي مع بعضهم البعض.	1	2	3	4	5	6	7
3	دافع أعضاء الفريق عن بعضهم البعض.	1	2	3	4	5	6	7
4	فقد الفريق ثقته.	1	2	3	4	5	6	7
5	شعرت بأنه يمكنني الاعتماد على أعضاء آخرين بالفريق	1	2	3	4	5	6	7
6	انخفض مستوى الجهد الجماعي لدى الفريق.	1	2	3	4	5	6	7
7	التواصل الفعّال حافظ على تركيز أعضاء الفريق على المهمة الموكلة اليهم.	1	2	3	4	5	6	7
8	بدأ أعضاء الفريق بفقدان الثقة في بعضهم البعض.	1	2	3	4	5	6	7
9	التزم أعضاء الفريق بالمساهمة في الايمان الجماعي بالفريق	1	2	3	4	5	6	7
10	قاتل أعضاء الفريق بشدة لدعم بعضهم البعض لكي لا يصابون بالخذلان.	1	2	3	4	5	6	7
11	نسي الأفراد أدوارهم في الفريق ولم يعرفوا ما يجب فعله.	1	2	3	4	5	6	7
12	ساعدتنا التحديات التي وجهناها كفريق في تعلم كيفية مقاومة الضغوط	1	2	3	4	5	6	7
13	لم يكن هناك دعم من أعضاء الفريق.	1	2	3	4	5	6	7
14	ساعدت الروابط القوية بين أعضاء الفريق في الأوقات الصعبة.	1	2	3	4	5	6	7
15	لم يتمكن الفريق من الصمود خلال اللحظات الأكثر صعوبة.	1	2	3	4	5	6	7
16	تمكن الفريق من إعادة تركيزه لتخفيف الضغط.	1	2	3	4	5	6	7
17	اكتسب الفريق الثقة من خلال العمل معًا لمقاومة الضغوط.	1	2	3	4	5	6	7
18	اعتمد الفريق على رؤية وقيم ومبادئ توجيهية مشتركة.	1	2	3	4	5	6	7
19	لم يؤمن الفريق بقدرته على المقاومة أمام الضغوط.	1	2	3	4	5	6	7
20	عكس الفريق رؤية مشتركة.	1	2	3	4	5	6	7

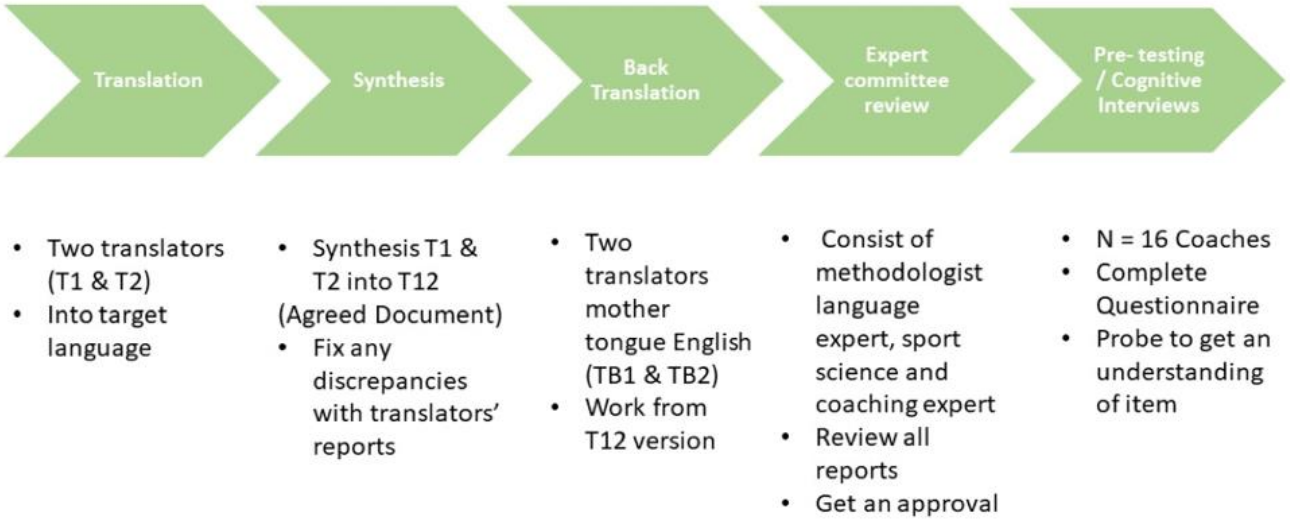

Figure 1.
Cross-cultural adaptation process.

Table 1.
Summary of the participants population characterise (n=16).

Variables	R1 (n = 5)	R2 (n = 5)	R3 (n = 6)
	Mean ± SD		
Age (Years)	34.6 ± 6.9	46.8 ± 7.6	43.6 ± 8.7
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Football	2	4	3
Basketball	1		3
Volleyball	1		
Handball	1	1	
Education			
Post-gradute Degree	2	1	4
College Degree	3	3	1
High School		1	1
Empolyment Status			
Part-time Coach	3	3	3
Fall-time Coach	2	2	3
Nationality			
Saudi	3	4	2
Egyotian	1	1	2
Tunisian	1		1
Jordanian	1		1
R = round, SD = standard deviation			

Table 2.
Overall results of cognitive interview of Characteristics of Resilience in Sports Teams Inventory (CREST).

Round	N	Participant Understanding of the Intended Meaning	The Content Was Cleear for the Participant	The Wording Was Clear for the Participant
R1	5	100%	100%	100%
R2	5	100%	100%	100%
R3	6	100%	100%	100%