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Translation, cultural adaptation, validity and reliability of the Greek version of the modified Constant Score



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Aim: The purpose of this study was to produce a modified Greek translation of the CS and to test this version in terms of reliability and validity.

Materials and methods: Translation of the modified Constant score testing protocol was done according to established international guidelines. Sixty-three patients with shoulder pain caused by degenerative or inflammatory disorders completed the Greek version of CS along with the Greek versions of SF-12 and Quick Dash Scores and the ASES Rating Scale and were included into the validation process. To assess test–retest reliability, 58 individuals completed the subjective part of the test again after 24–36 hours, while abstaining from all forms of treatment; internal consistency was measured using Cronbach's alpha (α); reliability was assessed with test–retest procedure and the use of Interclass Correlation Coefficient (ICC), whereas the validity of the reference questionnaire was evaluated using Pearson's correlation coefficient in relation to control questionnaires.

Results: There were no major problems during the forward–backward translation of the CS into Greek. The internal consistency was high (Cronbach's alpha 0.92) while the test–retest reliability for the overall questionnaire was also high (intra-class coefficient 0.95). Construct validity was confirmed with high values of Pearson's correlation between CS and Q-DASH (0.84), SF-12 (0.80) and ASES score (0.86) in respect.

Conclusion: A translation and cultural adaptation of CS into Greek was successfully conducted. The Greek version of the modified Constant Score can be a useful modality in the evaluation of shoulder disorders among Greek patients and doctors.

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Patient-reported outcome measures provide the patients' perspective of the impact of a disease and its treatment on their health and quality of life. The principal types of outcome measures for musculoskeletal disorders are joint-specific, such as the Constant Score (CS), as well as disease-specific and generic outcome measures (DASH and SF-12 scores). In general, outcome measures need to have high validity and reliability, namely measuring what it is supposed to and showing a minimum of intra-observer and inter-observer error respectively. They should also be responsive by being sensitive to change.

The Constant score was devised by C. Constant with the assistance of the late Alan Murley during the years 1981–1986. The score was first

presented in a university thesis in 1986 and the methodology was published in 1987.⁶ This functional assessment score was conceived as a system of assessing the overall value, or functional state, of a normal, a diseased or a treated shoulder. It is composed of objective and subjective sections divided into four subscales, including pain (15 points maximum), activities of daily living (20 points maximum), range of motion [ROM] (40 points maximum) and strength (25 points maximum). The higher the score the higher the quality of function (minimum 0, maximum 100). The Société Européenne pour la Chirurgie de l'Épaule et du Coude (SECEC) adopted this score in 1991 and charged its Research and Development Committee to study the score and issue guidelines. It was unanimously agreed that the score should be retained as a minimal data set for presentations and communications to the Society and to the Journal of Shoulder and Elbow Surgery, respectively.^{4,6} It was widely accepted that this score does not provide sufficient information for the assessment of certain conditions, particularly instability.¹³ However, at present, it is considered to be the most

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appropriate score for assessing overall shoulder function, but despite its wide adaptation by the orthopedic community, the CS has been criticized for several reasons including the inadequacy to address patient's pain using only a single pain scale, the interpretation of function mainly by the patient as there is no correlation to any certain activity and the lack of initial standardization of the method of strength measuring.^{14,17,18} Another weakness of this system is that it requires a large amount of objective data collection by the clinician, thus affecting inter-rater reliability and also appropriateness of age correction, and validity for specific purposes.^{1,17,18} To address the weaknesses of the score, Constant et al.⁵ published the modified CS in 2008 with specific modifications and guidelines for its use. Although this version helped clinicians to better understand the system, a standardized test protocol was not available in this report. In 2013 Ban et al.¹ published a Danish translation and cultural adaptation of the modified CS and provided a standardized test protocol for both the English and Danish versions. Accordingly, in 2016 Çelik⁹ successfully conducted a translation and cultural adaptation of the modified CS and its standardized test protocol into Turkish, as well as an assessment of its reliability and validity.

Even though the CS is widely used in Greece to assess shoulder pathologies, translated and culturally adapted versions of the modified CS and standardized test protocols have not yet been provided. Cross-cultural adaptations may contribute to a better understanding of the measurement properties. The need for validated translations has become more essential with the growing number of multicenter and multinational studies, which provide more statistical power to randomized controlled trials. Given the prevalence and socioeconomic impact of shoulder disorders we believe that a Greek cultural adaptation and validation of the CS would be extremely beneficial for Greek-speaking surgeons and patients.

The purpose of this study was, at first, to develop a standardized, easy handled test protocol in the original language (English) according to the initial version, the recommendation guidelines published in 2008 and the recent translations in Danish and Turkish^{1,5,9} and then to translate and cross-cultural adapt this new test protocol of the CS into Greek. The whole process was completed with a

reliability and validity check of the Greek CS according to international guidelines.²⁵

Materials and methods

The whole process involved three steps: the development of an English test protocol, its translation into Greek and finally the validity check procedure of the translated Greek CS version.

A. Development of the English test protocol

In this first step of the process an English test protocol of the CS that included all sub elements of the score according to the original⁶ and the modified guidelines⁵ was created by two members of our clinic's medical staff with certified excellent knowledge of the English language and medical terminology. The recent Danish translation of the CS by Ban et al.¹ provided a valuable source of support to our attempt. Each member worked separately and finally two versions of the initial English test protocol were discussed with the project coordinator [A.P.] so that a final form of the English version to be translated in Greek was established (Appendix S1a). This initial workgroup focused its efforts on creating a brief and simple questionnaire without affecting the overall quality and validity of the primary score and guidelines. Their ultimate goal was to produce a score which would fit in an A4-size page adding to the score's flexibility in terms of an easy-filling, storing-friendly form. It is known that in clinical practice larger multi-paged questionnaires are usually quite cumbersome as individual parts and may be lost or left blank by the patient.

B. Translation and cross-cultural adaptation into Greek [Fig. 1]

Translation and cross-cultural adaptation of the reference English CS into Greek was performed in 5 stages, consistent with the stages recommended by Beaton et al.² and the principles of the ISPOR Task Force guidelines²⁵ for translation and cultural adaptation of patient-reported outcomes.

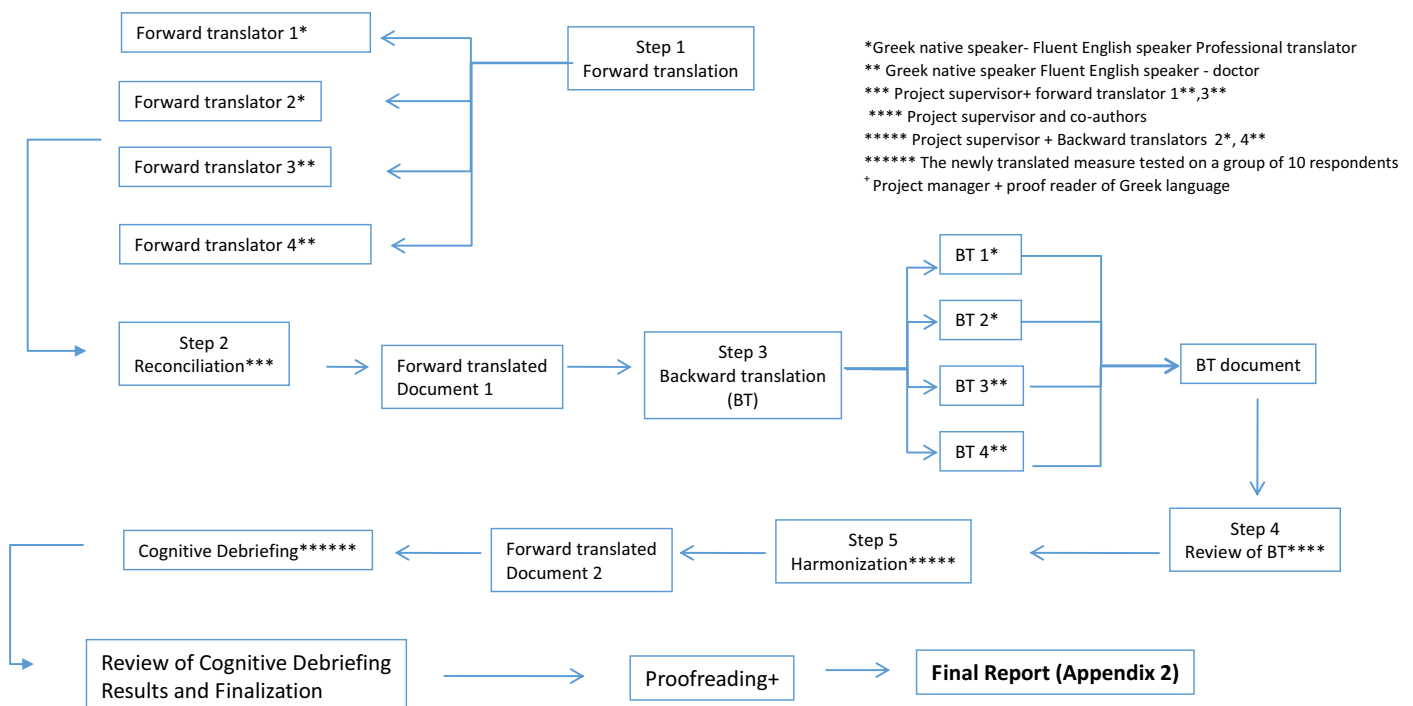


Figure 1 Diagrammatic scheme of the procedure followed for translation and cross-cultural adaptation of the Greek version of CS.

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