Commentary: Scoring Flaw in the Persian Version of Knee Injury and Osteoarthritis Outcome Score
A comment on "Validation of a Persian-version of Knee injury and Osteoarthritis Outcome Score (KOOS) in Iranians with knee injuries. Osteoarthritis Cartilage 2008 Oct;16(10):1178-82"

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Short Communication

Abstract

Knee Injury and Osteoarthritis Outcome Score (KOOS) assesses aspects of knee-related complications in young and middle-aged individuals suffering from various knee injuries. Salavati et al. cross-culturally adapted KOOS into Persian. However, the answer options for the fourth and fifth questions in the symptom section of the Persian version are ordered in reverse. Since there was not any scoring guide for Persian users that pointed out this issue, in spite of the fact that the correction is now accepted and cited by http://www.koos.nu, I decided to publish this commentary in Journal of Research in Rehabilitation Sciences as one of the highly cited bilingual journals in Iran. Considering this correction will definitely make the researches involving the Persian-speaking population more accurate and valid.

Keywords: Knee injuries; Osteoarthritis; Knee Injury and Osteoarthritis Outcome Score

Introduction

In the recent world, taking medical history and clinical evaluation are fundamental components of healthcare. Since process measures such as various paramedical data show poor correlation with outcome measures, direct measurement of clinical outcomes, using standard tools is a critical requirement in clinical practice and research (1). With the higher incidence of international collaborations in health-related research projects and multinational studies worldwide, health status measures are required to be administered synchronously in various languages (2). Even though most questionnaires are initially developed in English, health studies even in English-speaking countries involve immigrant populations (2). Therefore, by following the scientific adaptation process precisely, the researchers may confidently discuss various diseases, their consequences, and the treatment results in various populations (2).

First developed in 1998 by Prof. Ewa M. Roos (3), Knee Injury and Osteoarthritis Outcome Score (KOOS) assesses aspects of knee-related complications in young and middle-aged individuals suffering from various knee injuries. Salavati et al. cross-culturally adapted KOOS into Persian in knee injuries (4) and following anterior cruciate ligament (ACL) reconstruction (5). However, despite the scoring manual (6) and user guide (7) published by http://www.koos.nu, the official website of the KOOS questionnaire, the answer options for the fourth and fifth questions in the symptom section of the Persian version are ordered in reverse. Table 1 clarifies this mal-positioning.

In figure 1, the mal-positioning is visualized.

In the original version of KOOS, the first answer option for all the items in all the subclasses is "never/none", that has been supposed to be scored as zero since it indicates the best situation of the knee joint.

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Table 1. Mal-positioning of the answer options of the Knee Injury and Osteoarthritis Outcome Score (KOOS) symptom section in Persian version vs. original version

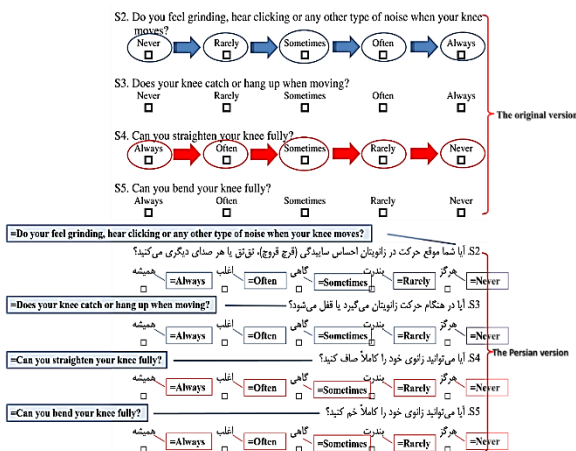| Item	Wording	Original version (score)	Persian version (score)
S4	Can you straighten your knee fully?	Always (4)	Never (4)
		Often (3)	Rarely (3)
		Sometimes (2)	Sometimes (2)
		Rarely (1)	Often (1)
		Never (0)	Always (0)
S5	Can you bend your knee fully?	Always (4)	Never (4)
		Often (3)	Rarely (3)
		Sometimes (2)	Sometimes (2)
		Rarely (1)	Often (1)
		Never (0)	Always (0)

Figure 1. Comparing the answer options for S4 and S5 to those for S2 and S3 in original and Persian versions of Knee Injury and Osteoarthritis Outcome Score (KOOS)

The joint situation gets worse if the subject selects other varieties; the last choice, which indicates the worst joint situation, always gets four. Considering the meaning of the S4 and S5 items, their phrasing *MUST* be different, so that the same scoring paradigm be applicable when scoring the proposed answers. Conversely, the developers reversed the wordings of the answer options instead, i.e., their first option is "always" that gradually moves toward "never". This fact was not noticed when the Persian version was adapted. Generally, adapted version of the questionnaires follows the same rule in scoring as the original version. However, mal-positioning of the answer options in items S4 and S5 in the Persian version of KOOS has made data transfer confusing, because the first option of the Persian version of S4 and S5 indicates the worst (not the best) joint situation; that is, selecting the first box for these items means that the subjects cannot fully straighten or bend their knee. If the user is precise enough, they may discover this misplacement and consider it during data transfer into statistical software. On the other hand, if they follow the user guide, they may misguidedly report a score of "4" for the subjects who chose the first box "never" in either item. Eventually, this may result in incorrect data interpretation and many further misjudgments in clinic and research. In the same way, this may even be a point to consider for the psychometric properties previously reported for the Persian version of KOOS (4, 5).

Obviously, the questions are phrased differently in different languages. In Persian translation, the S4 and S5 phrases have been properly translated into the best match of the original version; however, the researchers reversed the order of the answer options. Since there was not any scoring guide for Persian users that pointed out this issue, in spite of the fact that the correction is now accepted and cited by http://www.koos.nu (8), I realized that many Persian-speaking researchers did not correct their scoring according to the revised version. Since "Osteoarthritis and Cartilage" rejected publishing this commentary in 2016 and 2020, I decided to publish this commentary in Journal of Research in Rehabilitation Sciences as one of the highly cited bilingual journals in Iran. Considering this correction will definitely make the researches involving the Persian-speaking population more accurate and valid.

Authors' Contribution

All stages from design, ideation, and search of texts to editing and writing the manuscript were performed by Zahra Sadat Rezaeian.

Conflict of Interest

The authors did not have any conflict of interest. Dr. Rezaeian self-funded the present work and is working as assistant professors at the Department of Physical Therapy, Isfahan University of Medical Sciences since 2011.

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