

Acceptance , Reliability and Validity of the Arabic Version of Lysholm Knee Score

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ABSTRACT

Objectives: To generate a cross culturally adapted translation of the lysholm knee score and to assess its acceptability, reliability and validity as a patient reported outcome measure for Jordanian patients with anterior cruciate ligament (ACL) injuries.

Methods: The score was translated according to established guidelines to Jordanian Arabic and the psychometric analysis was prospectively conducted on a cohort of 73 patients with anterior cruciate ligament (ACL) injury recruited from the orthopaedic sports clinic in Prince Hashim bin Alhussein hospital during the period between March and August 2015. The translated score was assessed for internal consistency, test retest reproducibility within 14 days, face validity and floor and ceiling effects to assess content validity.

Results: The translated score was acceptable and easy to use. It showed adequate reliability (Cronbach's alpha=0.60) and good to excellent reproducibility (Intraclass correlation coefficient =0.85). No floor or ceiling effects were observed and the translated score showed good face validity.

Conclusion: The translated version of lysholm score to Jordanian Arabic is an acceptable, valid and reliable tool to assess Jordanian patients with ACL injuries.

Key Words: ACL injury, Cross Cultural adaptation, Jordanian Arabic, Lysholm Knee Score, psychometric properties, Translation.

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Introduction

Patient-reported outcomes (PRO) importance cannot be overemphasized in comprehensive quality patient care. These PROs are usually formulated into measurable tools, and to merit as a valid and reliable assessment instrument, these tools should demonstrate acceptable psychometric parameters. This also applies to translated versions of these PRO measures; it is imperative that translated scores undergo a rigorous process of cultural adaptation before induction into a target community, because many of the original scores are intended to reflect the

characteristics of the language and the social culture of the community in which they were established⁽¹⁾. The knee joint is prone to different soft tissue, bony and chondral injuries. Advances in surgical techniques have made the management of many of these injuries available, but in the realm of numerous surgical interventions and proposed management protocols, it is reasonable to suggest that the PRO measures can in conjunction with other outcome measures, help solicit one over the other⁽²⁾. Several measures of knee function exist including: International Knee Documentation Committee Subjective Knee Evaluation Form⁽³⁾, Knee Injury and

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Osteoarthritis Outcome Score⁽⁴⁾, Lysholm Knee Scoring Scale⁽⁵⁾, Tegner Activity Scale⁽⁵⁾, Oxford Knee Score⁽⁶⁾, and Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC)⁽⁷⁾. Lysholm knee score is used to evaluate outcomes of knee ligament surgery particularly symptoms of instability⁽⁷⁾. This score has also been validated for evaluation of patients with other knee problems such as anterior knee pain syndrome, meniscal tears, and various other traumatic and degenerative knee injuries^(8, 10, 11). First published in 1982 then revised in 1985⁽⁵⁾, Lysholm knee score is freely available and requires little time to complete and less than 5 minutes to score⁽⁵⁾. Lysholm score has been translated to many languages, but to our knowledge this score has not yet been translated to Arabic. It is thus the aim of this study to generate a validated and cross culturally adapted version of this score in Jordanian Arabic.

Methods

Lysholm score is readily available free online and there was no need to contact the original author for permission to adapt this score. The approval of the ethical committee at the Royal Medical Services was obtained prior to embarking on this study.

Translation and cross cultural adaptation: Lysholm score was translated to Arabic according to Principles of Good Practice for the Translation and Cultural Adaptation Process for Patient-Reported Outcomes (PRO) Measures: Report of the ISPOR Task Force for Translation and Cultural Adaptation⁽¹²⁾. In preparation an online version of the Lysholm score was obtained, two forward translations were then produced, one translation was carried out by a certified translation center blinded to the study and the other by one of the authors who is an Orthopedic surgeon with a good command of English (A.A). A panel of three of the authors (M.J, M.G, M.O) all orthopedic surgeons, carried out

the reconciliation of the forward translations into a single forward translation. This reconciled translation was then literally back translated to English by the language center/university of Jordan. The back translated version was again revised by the Authors. The Turkish version of Lysholm score¹³ was translated to Arabic by the Language center/university of Jordan. And all the produced translations were harmonized with the original version to ensure conceptual equivalence between the source and target language versions and between all translations. Our pilot study was conducted with six patients (all male) referred to our clinic. The translation was tested on this cohort to assess the level of comprehensibility and cognitive equivalence of the translation, to test any translation alternatives that have not been resolved, and to highlight any items that may be inappropriate at a conceptual level to identify any other issues that cause confusion. This cognitive debriefing was revised by our panel and the translation finalized and proofread for grammatical and spelling mistakes.

Patients:

73 patients (65 male) were recruited from the clinic of orthopedic sports at Prince Hashim Bin Alhussein Military hospital in AlZarqa city. Subjects were informed about the study and their verbal consent was obtained. Patients with clinical and radiological proof of ACL injury were included in the study Table I. Two orthopedic surgeons specialized in orthopedic sports carried out the examination. All patients were Jordanian and 18 years or older (mean age 29.6 ± 8.1 , range 19-57). The exclusion criteria were musculoskeletal and/or knee disorders other than ACL injury such as associated significant meniscal injuries or loss, patients receiving treatment between test and retest, and/or patients unable to complete the form due to cognitive dysfunction or illiteracy.

Table I: Patients demographics

| Diagnosis | Number (%) | Gender | | Age (range) |
|-------------------|------------|--------|---|-------------|
| | | M | f | |
| ACL injury | 31(42) | 27 | 4 | 19-34 |
| Reconstructed ACL | 35(47) | 32 | 3 | 21-57 |
| Failed ACL | 3(5) | 3 | 0 | 32-36 |
| Revision ACL | 4(6) | 4 | 0 | 28-32 |

Questionnaire:

The Lysholm Knee Scale is an 8-item questionnaire scored on a 0–100 weighted scale measuring pain (25 points), instability (25 points), locking (15 points), swelling (10 points), limp (5 points), stair-climbing (10 points), squatting (5 points) and use of support (5 points). The scale was originally designed to assess ligament injuries of the knee but it is commonly used as a self-complete measure in surgical studies involving patients with meniscal injuries and other knee pathologies(7).

Psychometric scale properties and data analysis:**Acceptability and ease of use:**

Reflected by the percentage of refusals, completed scores, time taken to fill in the score and the willingness to fill out the questionnaire a second time.

Reliability:

Internal consistency was calculated on the first administration using Cronbach's alpha which was considered acceptable if the value was 0.60 or above(14). Patients were provided with the translated version of lysholm score upon arrival to the clinic. They were asked to fill in the questionnaire by the clinic nurse or the attending physician. Patients were asked to return the completed questionnaire to the clinic nurse. A random sample of this cohort (n=30) were asked to come back to the clinic in two weeks for retest. The test retest stability was assessed by Intraclass Correlation Coefficient (ICC) that was if equal or greater than 0.7 considered acceptable (14).

Validity:

The translated version of Lysholm score was revised by 3 orthopaedic surgeons other than the translating panel to assess face validity. Floor or ceiling effects presence indicates the

likelihood of limited content validity. Floor/ceiling effects were considered present if more than 10%of the participants achieved either the lowest possible or highest –possible score (14) Date analyses were made using Microsoft office excel 2007 software

Results

Translation of lysholm score to Jordanian Arabic (appendix 1) was performed according to Principles of Good Practice for the Translation and Cultural Adaptation Process for Patient-Reported Outcomes (PRO) Measures: Report of the ISPOR Task Force for Translation and Cultural Adaptation. Literal translation of Lysholm score by the translation center was somewhat distant from many concepts, but rather helpful in building the structure of the sentences in Arabic. The translation of lysholm score from Turkish was useful as it highlighted an important concept; in both Arabic and Turkish cultures minutes are used to describe distances more than kilometers, we used both of these concepts in the pain subscale. There was no consensus on the best single word to describe giving way and clicking so we used two words to describe each. All patients agreed to complete the questionnaire (response rate 100 %), all papers were returned back and 4 of these had missing items (overall missing items rate 0.12 %). All patients who were asked to come back for test-retest came back a second time. Suggesting good acceptability of the translated score. The overall mean score in our sample for lysholm score was (42.7±19.4) range (8-88). The translated Lysholm showed adequate internal consistency; chronbach's alpha was calculated as 0.60. For test retest reliability done approximately after 14 days intraclass correlation coefficient was 0.85 overall (p<0.001) and this was also good to excellent for the different subscales(range 0.7-0.91) .Table II . The consulted panel of three

orthopaedic surgeons agreed that the translated version of Lysholm showed good face validity. There were no floor or ceiling

effects as only one patient scored below 10 and none over 90 overall.

Table II: Test-retest reliability of the translated Lysholm score

| Lysholm knee score | Mean ± SD | | Reliability | |
|----------------------------|-------------|-------------|-------------|------|
| | Test 1 | Test 2 | P value | ICC* |
| Pain | 2.9 ± 9.6 | 3.2 ± 1.2 | < 0.001 | 0.81 |
| Instability | 4.4 ± 1.2 | 4.2 ± 1.37 | < 0.001 | 0.82 |
| Locking | 6.1 ± 3.9 | 5.4 ± 3.0 | 0.001 | 0.75 |
| Stair climbing | 12.3 ± 9.0 | 13 ± 9.2 | 0.003 | 0.70 |
| limb | 12 ± 9.0 | 10.6 ± 9.2 | < 0.001 | 0.90 |
| Support | 5.3 ± 4.0 | 5.2 ± 3.9 | < 0.001 | 0.70 |
| Swelling | 6 ± 1.5 | 5.7 ± 1.8 | 0.003 | 0.82 |
| Squatting | 2.8 ± 1.0 | 2.7 ± 1.2 | < 0.001 | 0.91 |
| Overall lysholm knee score | 51.9 ± 20.1 | 50.0 ± 20.2 | < 0.001 | 0.85 |

*ICC intraclass correlation coefficient

Discussion

Lysholm score was translated to Arabic according to the report of the ISPOR Task Force for Translation and Cultural Adaptation. The method we adapted was more lengthy as contrasted to the proposed original method of Guillemin used in many similar studies, but we felt that this report is an updated and more clarified version of the original method. This translated version is acceptable and easy to use. The Arabic lysholm showed adequate reliability and good face and content validity as a PRO score for Jordanian patients with ACL injuries. The power of the study was significant and the results obtained were similar and comparable to other translations done to assess the reliability of the score on a similar sample of patients^(13, 14) Table III. The absence of another Jordanian Arabic validated knee score made it difficult to assess construct validity and despite the

presence of a good number of knee scores translated for other Arabic speaking countries, there is still no agreement on the methodology of validating these scores between different cultures speaking the same language. As our study was conducted in a military hospital, it included a significant number of military personnel and most of our cohort was male; the lack of heterogeneity may have weakened our study as applicable to the Jordanian population as a whole. And although our service with over a 1000 ACL injuries reported and around 400 ACL reconstructions being performed annually might be the leading sport service in Jordan. Still involvement of the other health sectors as the university hospitals and the private sector could be done for the study to be more representative of the Jordanian community.

Table III: test retest reliability and internal consistency of lysholm score

| Scale | Test retest reliability(ICC*) | Interval | Cronbach's alpha |
|-----------------------|-------------------------------|----------|------------------|
| Original Lysolm Score | 0.90 | 14 days | |
| Turkish Version | 0.82 | 3-4 days | 0.68 |
| Chinese version | 0.93 | 7 days | 0.726 |
| Arabic Version | 0.85 | 14 days | 0.6 |

*intraclass correlation coefficient

Conclusion

The need for a valid score to assess Jordanian patients with knee problems is important from a clinical and research point of view. This culturally adapted translation of the Lysholm knee score to Jordanian Arabic is a valid, reliable and easy to use tool to assess Jordanian patients with ACL injuries.

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Appendix 1: Arabic version of the Lysholm Score

مقياس ليشولم: Lysholm knee scoring scale

| | | |
|----|--|---|
| | | العرج (5 نقاط) Limp |
| 5 | | ليس لدي عرجة عند المشي I have no limp when I walk |
| 3 | | لدي عرجة خفيفة احيانا I have a slight or periodical limp when I walk |
| 0 | | لدي عرج شديد و دائم I have a severe and constant limp when I walk |
| | | استعمال الباكورة أو العكازات (5 نقاط) Using cane or crutches |
| 5 | | لا استعمل الباكورة او العكازات I do not use a cane or crutches |
| 2 | | أستطيع تحميل بعض الوزن على رجلي المصابة باستعمال الباكورة او العكازات I use a cane or crutches with some weight bearing |
| 0 | | لا أستطيع تحميل اي وزن على رجلي المصابة putting weight on my hurt leg is impossible |
| | | التعليق او التدوير في الركبة المصابة (15 نقطة) locking sensation in the knee |
| 15 | | لا يوجد تعليق او تدوير في ركبتي I have no locking and no catching sensation in my knee |
| 10 | | يوجد دفرة ولكن لا يوجد تعليق I have catching sensation but no locking in sensation in my knee |
| 6 | | تعليق احيانا My knee locks occasionally |
| 2 | | تعليق باستمرار بشكل متكرر My knee locks frequently |
| 0 | | ركبتي حاليا معلقة My knee feels locked at this moment |
| | | عدم اتزان الركبة (25 نقطة) Giving way sensation from the knee |
| 25 | | لا يوجد عندي عدم اتزان My knee never gives way |
| 20 | | يوجد عندي عدم اتزان فقط عند القيام بالنشاطات الرياضية القوية My knee rarely gives way, only during athletics or vigorous activity |
| 15 | | يوجد عدم اتزان عند القيام بالنشاطات الرياضية العادية مما يمنعني من القيام بهذه النشاطات My knee frequently gives way during athletics or other vigorous activities. In turn I am unable to participate in these activities |
| 10 | | احيانا هناك عدم اتزان عند القيام بالواجبات اليومية العادية My knee frequently gives way during daily activities |
| 5 | | غالبا يوجد عدم اتزان اثناء القيام بالواجبات اليومية العادية My knee often gives way during daily activities |
| 0 | | عدم اتزان في كل خطوة اخطوها My knee gives way every step I take |
| | | الالم : (25 نقطة) Pain |

| | |
|----|--|
| 25 | ليس لدي الم في الركبة I have no pain in my knee |
| 20 | لدي الم خفيف اثناء النشاطات الرياضية القوية I have intermittent or slight pain in my knee during vigorous activities |
| 15 | لدي الم شديد اثناء الانشطة الرياضية القوية I have marked pain in my knee during vigorous activities |
| 10 | لدي الم شديد في ركبتي اثناء او بعد مشي مسافة تزيد عن 2 كم او نصف ساعة مشي I have marked pain in my knee during or after walking more than 1 mile |
| 5 | لدي الم شديد في الركبة اثناء او بعد مشي مسافة اقل من 2 كم او نصف ساعة من المشي I have marked pain in my knee during or after walking less than 1 mile |
| 0 | لدي الم مستمر في ركبتي I have constant pain in my knee |
| | ورم الركبة او السوائل : (10 نقاط) Swelling |
| 10 | ليس لدي ورم في الركبة I don't have swelling in my knee |
| 6 | تتورم ركبتي بعد الانشطة الرياضية القوية I have swelling in my knee only after vigorous activities |
| 2 | تتورم ركبتي بعد النشاطات اليومية العادية I have swelling in my knee after ordinary activities |
| 0 | لدي ورم مستمر I have swelling constantly in my knee |
| | صعود الدرج : (10 نقاط) Climbing stairs |
| 10 | لا يوجد لدي صعوبة في صعود الدرج I have no problems climbing stairs |
| 6 | لدي مشكلة بسيطة في صعود الدرج I have slight problem climbing stairs |
| 2 | استطيع صعود الدرج درجة درجة فقط I can climb stairs only one at a time |
| 0 | صعود الدرج مستحيل بالنسبة لي Climbing stairs is impossible for me |
| | جلوس القرفصاء : (5 نقاط) Squatting |
| 5 | لا يوجد لدي صعوبة في القرفصة I have no problems squatting |
| 4 | لدي مشكلة بسيطة في القرفصة I have slight problems squatting |
| 2 | لدي صعوبة في القرفصة وثني الركبة 90 درجة I cannot squat beyond 90 degrees bend in my knee |
| 0 | لا استطيع القرفصة نهائيا بسبب وضع ركبتي squatting is impossible because of my knee |
| | المجموع Total |