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A cross-cultural adaptation of the Upper Limb Functional Index in French Canadian

Tokiko Hamasaki OT, MSc candidate [a,c,*], Louise Demers OT, PhD [b,c], Johanne Filiatrault OT, PhD [b,c], Ginette Aubin OT, PhD [d]

[a] Hand Centre, Centre hospitalier de l'Université de Montréal (CHUM), 1560 Sherbrooke East, Pavilion Lachapelle, Room A-2014, Montreal, Quebec, Canada H2L 4M1
[b] Centre de recherche de l'Institut universitaire de gériatrie de Montréal, Canada
[c] School of Rehabilitation, Université de Montréal, Canada
[d] Occupational Therapy Program, Université du Québec à Trois-Rivières, Canada

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ABSTRACT

Study design: Clinical measurement.
Introduction: The Upper Limb Functional Index (ULFI) is a self-report questionnaire assessing activity limitations/participation restrictions resulting from an upper limb musculoskeletal disorder (UL-MSD). It is suitable for use in a rehabilitation context where clinicians have important time constraints due to a heavy caseload. However, no French version was available until now.
Purpose/methods: To perform a cross-cultural adaptation of the ULFI in French Canadian and examine the psychometric properties and clinical applicability of the adapted version (ULFI-FC) among 50 bilingual patients.
Results: The ULFI-FC showed high internal consistency (Cronbach $\alpha = 0.93$), good convergent validity with the original ULFI ($r = 0.85$) and with the French Canadian version of the Disabilities of the Arm, Shoulder and Hand ($r = -0.85$) and good applicability.
Conclusion: This study supports the suitability of the ULFI-FC for use in a busy rehabilitation setting for French-speaking patients with UL-MSD.
Level of evidence: N/A.

Introduction

According to the World Health Organization, musculoskeletal disorders (MSD) are the principal cause of impairments in the industrialized countries, leading to a loss of productivity.[1] Prevalence studies of the Canadian workforce show that the most affected body part is the trunk (37.0–52.2%), then the upper limb (UL) (23.9–30.1%), yet the UL injuries impose the longest annual indemnity (81.1 days). followed by back problems (53.6 days).[2,3] These disorders can cause important activity limitations and impede on occupations in the personal care, work, or leisure domains.[1] Despite these facts, the assessment of progress of UL-MSD patients in rehabilitation often focuses on physical dimensions like range of motion, handgrip strength, or tactile sensation while less attention is devoted to the assessment of activity limitations and restrictions in personal care, work and leisure.[4–9] Moreover, physical impairments and activity limitations correlate only weakly or moderately in patients with UL-MSD.[4,7,10–17]

Quite a few patient-report outcome measures have been developed to assess activity limitations and occupation restrictions among patients presenting with an UL-MSD.[10,18–20] Besides having sound psychometric properties, the clinical applicability of these measures is an important characteristic to consider when selecting a tool. Auger, Demers and Swaine defined applicability as "pragmatic qualities allowing the use of a measurement tool with a given population or in a specific context."[21] It is assessed through four dimensions, namely: 1) the respondent (patient) burden; 2) the examiner (therapist) burden; 3) the score distribution; and 4) the format compatibility.[21] Respondent and examiner burdens concern administration time, space, costs, and intellectual, emotional and/or physical effort involved in the assessment process. Score distribution considers data normality and the absence of a floor/ceiling effect in order to differentiate different levels of disability among

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* Corresponding author. Tel.: +1 514 890 8000x25473; fax: +1 514 412 7644.
E-mail addresses: tokiko.hamasaki.chum@ssss.gouv.qc.ca, okikot@msn.com (T. Hamasaki).

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a target population. Format compatibility refers to the fit between the outcome measure's format and the target population's characteristics (e.g., age, culture or language).[21,22]

Among the tools available to assess activity limitations and participation restrictions of UL-MSD patients, we notice that few of them are applicable in a health care context where rehabilitation professionals have important time constraints due to a heavy caseload. The Disabilities of the Arm, Shoulder and Hand (DASH),[23] though arguably the most well-known self-report questionnaire for a UL-MSD clientele, has a lengthy administration time, limiting its applicability in some clinical contexts.[24,25] The QuickDASH,[24] the Patient-Rated Wrist/Hand Evaluation,[26] the Upper Extremity Functional Index[17] and the Upper Limb Functional Index (ULFI)[4,27] have demonstrated their applicability in clinical contexts imposing important time constraints to clinicians. Among these outcome measures, the ULFI appears the most interesting in terms of clinical applicability. Besides its short completion time, the ULFI has a readability level below a seventh grade, acceptable for the majority of patients. It can rapidly be scored and requires no computational aid. This tool thus imposes little burden both on patients and therapists. Previous studies conducted among patients with UL-MSD also showed that the ULFI had a normal and wide score distribution without ceiling/floor effects.[4,27] The ULFI has also the advantages of allowing patients to report activities that they consider meaningful and important to target during rehabilitation. This is consistent with a patient-centered approach to rehabilitation. Indeed, information on these activities can be useful in the establishment of therapeutic goals.[28] The ULFI has strong psychometric properties. It has high internal consistency (Cronbach $\alpha = 0.92$), excellent test-retest reliability (intraclass correlation coefficient = 0.98), good convergent validity with the QuickDASH questionnaire (Pearson coefficient = 0.84) and good responsiveness (effect size = 0.93; standard response mean = 1.33), as demonstrated in a study conducted among 117 adults with UL-MSD.[27] Therefore, the ULFI meets several paramount criteria for tool selection in a clinical context with important time constraints. Unfortunately, the tool was only available in English and Spanish[29] until now and could not be used for the large proportion of patients who are French-speaking in Canada.

Purpose of the study

In light of the previous consideration, the objectives of this study were: (1) to perform a cross-cultural adaptation of the ULFI for a French Canadian population; and (2) to assess the psychometric properties of the French Canadian version of the tool (ULFI-FC), namely its internal consistency, its convergent validity with the original ULFI and with a French Canadian version of the DASH, and its applicability in a clinical context with important time constraints.

Methods

A six-step procedure based on the cross-cultural adaptation guidelines of Beaton and colleagues[30,31] and Vallerand[32,33] was followed. The project was approved by the research ethics committee of the *Centre hospitalier de l'Université de Montréal* (CHUM) where the study was conducted.

Phase 1 — cross-cultural adaptation of the ULFI

First, the ULFI was translated from English into French separately by two persons: a professional translator (T1) who had no grasp of the ULFI concept, and a bilingual therapist (T2), familiar with the ULFI and more sensitive to the conceptual equivalence. The two translated versions of the ULFI were compared by an expert committee composed of the principal researcher, one translator (T2), three therapists and two adults with a history of UL-MSD. For each item, the committee selected the wording that was judged easier to understand or more appropriate in terms of conceptual equivalence. This process led to the development of a consensual French Canadian version of the ULFI, based on the synthesis of both translations.

The next step involved two backward translations of the consensual French Canadian version into English by two professional translators whose mother tongue was English and had no knowledge of the ULFI. After completion of this step, the two backward translations, the consensual French Canadian version and the original ULFI were printed on a single chart, item by item, to facilitate the review and comparison by the expert committee. The principal author of the original ULFI also participated in the process. No major discrepancies among the three English versions were found. Thus, the French Canadian version was deemed appropriate without any further modification and ready for pre-testing.

The pre-test was conducted among a sample of 17 French-speaking adults. The respondents were invited to report on any ambiguous or incomprehensible expression or item, and on any difficulty encountered due to the tool's layout. The principal researcher then consulted each member of the expert committee individually to analyze participants' responses to improve the content and layout of the tool. Final modifications included shortening the instructions (for Parts 1, 2 and 4) and reformatting the question in Part 3 with more familiar terms to increase its readability.[30,34,35] A final experimental version of the ULFI-FC was subsequently created by consensus among members of the expert committee.

Phase 2 — assessment of the psychometric properties and applicability of the ULFI-FC

Participants

A sample size of 50 was determined according to established standards within a classical test theory framework.[36,37] Outpatients of a hand centre housed in a university hospital in Canada participated in the study. Patients were eligible to the study if they met the following criteria: 1) being aged 18 years and over; 2) being bilingual (French and English); 3) involved in rehabilitation for a hand/wrist injury, a rheumatic disease or another hand/wrist MSD condition; and 4) considered in a subacute or chronic phase based on symptoms' duration. This last criterion ensured the stability of participants' condition required by the study design (see below). The level of bilingualism was determined by the Language Skills Rating Scale[32,33,38] that examines four communication abilities — reading, writing, understanding a conversation and speaking in French and English. Patients presenting with a cognitive impairment were excluded from the study.

Potential participants were provided with explanations relative to the purpose and nature of the study and signed the consent form if they agreed to participate in the study.

Study design and data collection

Data collection involved two visits of participants at the hand centre with a delay of at least two days between visits to reduce a possible memory bias[39,40] and no more than seven days to avoid an actual change in the patients' activity/participation level. No therapy was provided between the two visits. Participants completed either the original English ULFI or its French Canadian version at the first visit and completed the alternate version of the questionnaire at the second visit. To reduce a potential memory bias, the order of item presentation in the questionnaire was modified at the second visit. A French Canadian version of the DASH[41] (later called DASH-FC) was