



ORIGINAL RESEARCH

Patient and Therapist Agreement on Performance-Rated Ability Using the de Morton Mobility Index

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Abstract

Objective: To determine the level of agreement between patient self-report and therapist-assessed performance of mobility using the de Morton Mobility Index (DEMMI).

Design: Interrater agreement study.

Setting: Outpatient hospital clinic.

Participants: Consecutive sample of patients (N=128) undergoing preoperative assessment for elective lower limb (LL) arthroplasty.

Interventions: Participants completed a therapist-directed assessment of the DEMMI followed by self-report of performance. A random subsample (n=62, 48%) also completed a self-report of anticipated performance before the therapist-directed assessment. Both raters (participant and therapist) were blinded to the scores obtained from the other rater.

Main Outcome Measures: Interrater agreement between patient self-report and therapist-directed assessment of the total DEMMI scores was assessed using the intraclass correlation coefficient model 2,1 (ICC_{2,1}) with a 95% confidence interval. The Bland-Altman plots were also used to illustrate the agreement between the 2 raters.

Results: The intraclass correlation coefficient (ICC) between patient self-report after performance and therapist-directed assessment of the total DEMMI score was .967 (95% confidence interval, .952–.977). The ICC between patient self-report of anticipated performance and therapist-directed assessment of the total DEMMI score was .830 (95% confidence interval, .730–.894). The Bland-Altman plots depicted higher levels of agreement among participants with impaired levels of mobility (≤ 74 out of 100) than did those with near-maximum DEMMI scores.

Conclusions: Patient self-report of anticipated performance is an acceptable proxy for DEMMI scores derived from the therapist rating of performance. Caution should be exercised when interpreting self-report scores of patients with near-maximum levels of mobility. Further research is required to establish whether these results can be generalized across a range of patient populations and to clinicians with differing backgrounds and expertise.

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Poor mobility is associated with reduced independence in activities of daily living,¹ cardiovascular deconditioning,² increased falls risk,^{3,4} reduced quality of life,⁵ institutionalization,⁶ and mortality.¹ The *International Classification of Functioning, Disability and Health*^{7(p138)} defines *mobility* as “moving by changing body position or location or by transferring from one place to another, by carrying, moving or manipulating objects, by walking, running or climbing, and by using various forms of

transportation.” Restricted mobility is the most common disability type in the United States, with 1 in 8 adults reporting serious difficulty walking or climbing stairs.⁸

The ability to reliably and accurately measure mobility is necessary to identify those in need of treatment and to measure treatment effects. The de Morton Mobility Index (DEMMI) is an instrument that has been shown to be valid, reliable, and robust across the mobility spectrum and clinical settings.⁹⁻¹⁵ It has been designed as a performance-based assessment that relies on clinician observation and performance rating on 15 hierarchical mobility activities ranging from sitting unsupported to tandem stand with eyes closed. A problem with this approach is that it requires face-to-face contact or observation mediated through video.

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The ability to use patient self-report of perceived performance ability in addition to performance-based assessment of the DEMMI has the potential to aid future clinical practice and research by eliminating the cost burden (clinician time, patient time, travel) of face-to-face assessment. Previous researchers have reported that a similar measure, the modified Barthel Index, was quicker to complete as a self-reported rather than therapist-assessed measure¹⁶ and argued that it could be administered via in-person interview or by telephone.¹⁷ Self-reported walking ability has also been demonstrated as an accurate predictor of mobility performance.^{18,19} However, substitution of therapist-assessed with self-report outcomes is acceptable only if there are high agreement levels between therapists and patients, and this may not always be the case.²⁰ For example, 31% to 63% of older adults undergoing inpatient rehabilitation have been shown to underestimate personal fall risk as compared to clinician-rated functional ability.²¹

The primary aim of this study was to determine the level of agreement between patient self-reported mobility and therapist-assessed performance using the DEMMI. Both anticipated self-report (assessed before physically attempting the tasks) and self-report postperformance (assessed after DEMMI performance) were examined. Secondary aims were to examine whether the agreement level was affected by age, sex, or linguistic background of our sample or whether actual performance or patient self-report preperformance affected patient self-report postperformance using the DEMMI.

Methods

Study design

This was an interrater agreement study design whereby patient self-report of perceived ability before and after actual performance was compared with therapist-assessed performance using the DEMMI.

Participants and setting

Consecutive patients undergoing preoperative assessment for elective lower limb (LL) arthroplasty were recruited between August 7, 2014, and December 4, 2014, as part of a larger study investigating the timing and dose of allied health intervention in the acute postoperative phase following arthroplasty. Adults older than 18 years undergoing elective LL arthroplasty at a 520-bed public teaching hospital situated in the southeastern suburbs of Melbourne, Australia, were approached for consent. The types of joint arthroplasty considered for inclusion were total hip arthroplasty, total knee arthroplasty, and revision total hip or knee arthroplasty. Exclusion criteria were patients undergoing arthroplasty immediately after trauma (eg, fracture) and patients with moderate cognitive impairment assessed as ≤ 5 out of 10 on the Short Portable Mental Status Questionnaire.²² A professional interpreter was employed for participants upon request as part of their preoperative assessment.

List of abbreviations:

DEMMI	de Morton Mobility Index
ICC	intraclass correlation coefficient
ICC_{2,1}	intraclass correlation coefficient model 2,1
LL	lower limb

Measurement

In this study, the DEMMI was used to assess mobility of patients undergoing preoperative assessment for elective LL arthroplasty. The DEMMI was developed to overcome ceiling and floor effects demonstrated in other mobility instruments used in clinical populations²³ and has face validity for measuring patients ranging from those who are bedbound to those with high levels of independence.¹¹ Rasch analysis has been used to construct an interval level scoring system out of 100 from the 15 ordinal items.²⁴ The DEMMI has been widely used and validated in mixed populations (including LL arthroplasty) across the full mobility spectrum and clinical settings (acute, subacute, community), in which this patient population is commonly seen.^{9,10,12-15,25}

Procedure

This study was performed and reported in accordance with Guidelines for Reporting Reliability and Agreement Studies.²⁶ Approval to conduct this study was obtained from Monash Health Human Research Ethics Committee (reference number 13327B). A consecutive sampling methodology was adopted whereby all patients attending preoperative assessment before LL arthroplasty were approached for consent in the order of presentation. Written informed consent was obtained from all consenting participants.

A computer-generated randomization process^a was used to allocate participants to 1 of 2 groups. One group was asked to self-rate their perceived mobility level using the DEMMI without actually attempting any of these tasks (anticipated performance). The investigator (R.H.) conducting the performance-based assessment of the DEMMI was blinded to participant's self-report. This group then undertook a therapist-directed assessment of the DEMMI during which the investigator (R.H.) rated their ability as they performed each task. Participants were not informed of the rating made by the investigator. These participants were then asked to again rate their performance using the DEMMI, having recently attempted all tasks (self-report postperformance). Participants allocated to the second group were not asked to self-rate perceived mobility before completing the therapist-directed assessment. These participants completed only the therapist-directed assessment and then rated their performance on the DEMMI. They were also blinded to investigator rating. This second group allowed us to examine whether there was a potential confounding effect of completing self-report of anticipated performance on postperformance ratings.

Therapist-directed assessment was conducted according to the DEMMI handbook.²⁷ Items were scored at the lowest score if a participant declined to attempt a task or was deemed unsafe to do so. Participants were provided with the same verbal explanation as in the DEMMI handbook when they were completing their self-reported assessments. The investigator conducting the therapist-directed assessments was a physiotherapist who has worked in geriatric settings for 15 years (R.H.).

Data analysis

Interrater agreement between performance-based and self-reported (both anticipated and postperformance) total DEMMI scores was assessed separately using the intraclass correlation coefficient model 2,1 (ICC_{2,1}) with a 95% confidence interval. Agreement between self-report of anticipated performance and

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