Interview Functional Independence Measure score: self-reporting as a simpler alternative to multidisciplinary functional assessment

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ABSTRACT

Introduction: The Functional Independence Measure (FIM) is a validated, objective assessment of functional status. Though widely used in rehabilitation centres, it may not be practical for all patients due to time and/or personnel constraints. Studies show positive and negative agreements on self-reported FIM scores for patients with spinal cord injuries and amputees. We tested the validity of the self-reported FIM motor score among stroke patients.

Methods: In a prospective, double-blinded comparative study of patient self-reporting against multidisciplinary assessment, using the standard FIM algorithm, all eligible stroke patients (n = 47) admitted to our rehabilitation centre were included. Only 33 patients were included in the final analysis.

Results: There was substantial agreement for overall FIM motor score between patient self-reporting and multidisciplinary assessment (intraclass correlation [ICC] 0.651; 95% confidence interval 0.404–0.811). The scores of individual motor items also showed fair-to-good agreement (ICC range 0.431–0.618), except for eating, grooming, bathing and dressing of lower body (ICC < 0.400).

Conclusion: There was no FIM assessment for 14 (29.8%) patients, which highlighted the need for alternative assessment tools. Discrepancies in some scores could be due to ignorance among patients about their own limitations or feelings of embarrassment about reporting. Our results may not be valid for patient populations with cognitive or communication deficits. However, a modest agreement between patient self-reporting and multidisciplinary assessment of FIM motor score was demonstrated. Though patients tend to overrate their performance, self-reported FIM motor score could be an alternative in situations where multidisciplinary FIM assessment may be difficult.

Keywords: FIM instrument, self-assessment, stroke, validity
INTRODUCTION

During rehabilitation, functional assessment is important to not only accurately assess functional improvement of patients but also help with prognostication, individualisation of patient care, quality assurance and national healthcare planning. The Functional Independence Measure (FIM) is a validated, objective assessment of functional status that is commonly used in rehabilitation centres. It directly observes patients and the performance-based assessments are done by multidisciplinary teams – including doctors, therapists and nurses – thus being considered the gold standard for functional assessments. However, being a time-consuming and laborious task, multidisciplinary measurement of FIM scores may not be feasible for all patients. There is thus a need for an alternative and reliable method that can be easily delivered. This would help improve follow-up assessments and aid in future research.

Studies on the validity of patient self-reported FIM (FIM-SR) have shown both positive and negative agreements. A study by Massedo et al on FIM-SR assessment among patients with spinal cord injuries and chronic pain, and amputees showed reliable results in FIM-SR motor scale and total FIM-SR score, but poor agreement in cognitive score.\(^{(1)}\) The authors also found poor agreement of scores in bathing (63%) and dressing (64%). Another study among elderly patients with hip fractures showed comparable mean FIM ratings between a trained personnel (84.3) and the multidisciplinary team (80.5) \((p < 0.001)\), with intraclass correlation \((ICC)\) of 0.74.\(^{(2)}\) Studies on stroke patients\(^{(3)}\) and patients with spinal cord injuries\(^{(4)}\) also showed comparable ratings. In another study, two statistically significant factors found to affect the outcome among hospitalised elderly patients were: (a) cognitive impairment \((27\% \text{ had Mini-Mental State Examination score} < 24 \text{ and } 12\% \text{ had Global Depression Scale score} > 14) \,(p < 0.001)\); and (b) decline in activities of daily living (ADLs) from pre-hospital levels.\(^{(5)}\) Major limitations of these earlier studies included their small sample sizes and the restriction of study criteria to include patients with only non-stroke-related functional impairments. To
the best of our knowledge, the only other study done among stroke patients compared telephone FIM ratings, where the assessment was done by a registered nurse rather than a multidisciplinary team.\(^{(3)}\)

Our study tested the validity of self-reported FIM motor scores in stroke patients against scores obtained by multidisciplinary assessment.

**METHODS**

This was a prospective, double-blinded study comparing patient self-reporting of the motor subset of the FIM against multidisciplinary assessment. The cognitive and communication domains of FIM were excluded during both assessments because accurate self-reporting of these items is difficult. The FIM motor scoring is also a measure of independence in mobility and performance of ADLs. The study was approved by the institutional ethics review board. We included all patients with a diagnosis of new stroke admitted to our tertiary care neurorehabilitation centre from October 2013 to May 2014. Those who were premorbidly dependent on their ADLs as well as those who had aphasia, depression, cognitive impairment, chronic pain or acute medical deterioration were excluded. Among the 97 patients admitted, 47 patients satisfied the eligibility criteria. For another 14 patients, the FIM assessments were not performed by the multidisciplinary team and were also excluded. The final analysis sample of 33 was achieved within available time and manpower constraints. The multidisciplinary assessment and patient self-reporting of the individual 13 motor items based on the standard FIM scoring algorithm were recorded during the last week prior to discharge. Patient reporting was documented by an interviewer, a fourth-year medical student, who was certified to administer the FIM. Both the multidisciplinary team and interviewer were blinded to each other’s assessment. The individual scores were then summed up for the overall FIM motor score of each patient. We compared the individual scores and overall FIM motor scores
obtained during the assessments by the multidisciplinary teams and self-reporting patients. Bland Altman plot and ICC was computed for the overall FIM motor score as well as the individual 13 items to assess the agreement and consistency between patient self-reporting and multidisciplinary assessment.\(^{(6)}\) IBM SPSS Statistics version 20 (IBM Corp, Armonk, NY, USA) was used.

RESULTS
Mean age of patients was 61 years and patients included were ethnically Chinese, Malay and Indian. We found good agreement for overall FIM motor scores between patient self-reporting and multidisciplinary assessment, with ICC of 0.651 (95% confidence interval 0.404–0.811) (Table I). Scores of the individual 13 motor items also showed fair-to-good inter-rater reliability, with ICC in the range of 0.431–0.618, except for eating, grooming, bathing and dressing of the lower body (ICC < 0.400). Bland Altman analysis (Fig. 1) found a mean difference in overall FIM motor score of 5.5 (95% CI 2.3–8.8) and the limits of agreement were −12.5, +23.6. Except for one, all other observations were spread within +1.96 SD.

DISCUSSION
The present study evaluated the validity of self-reported FIM motor scores in stroke patients as an easier alternative to FIM scoring by a multidisciplinary team. For the overall FIM motor scoring, good agreement was seen between multidisciplinary assessment and patient self-reporting.

Self-reporting by patients was generally higher than ratings given by the multidisciplinary team (Table. 1). The higher rating given by patients for ADLs, such as eating, bathing, dressing of the lower body and grooming, could be partly due to embarrassment on the part of patients when it comes to reporting them, as suggested in other studies.\(^{(2)}\)
discrepancy may also be due to the ignorance of patients about their own limitations while being an inpatient, as patients may not be performing these activities without assistance at the rehabilitation centre. Post-discharge assessment may provide a more accurate evaluation of these items. Previous studies on patients discharged home have shown the reliability of FIM scores obtained by telephone interview.\(^{(3)}\)

We found the limits of agreement between self-reported and multidisciplinary team reported FIM score to be between \(-12.5\) and \(+23.6\). Among stroke patients, the reported minimal clinically important difference in FIM motor score was 17 points while moderate clinically important difference was 22 points.\(^{(7)}\) The authors believe that the observed error limits in this study are within accepted clinical limits and unlikely to lead to clinical consequences.

The multidisciplinary team did not perform the FIM assessment for 14 (29.8%) of 47 patients who met the inclusion criteria and these patients had to be excluded from the study. We assumed this was partly due to manpower and/or time constraints, and expect this to be commonplace in rehabilitation centres. This finding, however, underscored the need for alternative assessment tools, such as interviewer-based or patient self-reported scoring systems, which can be reliably used for inpatients in rehabilitation centres when multidisciplinary FIM assessment may be difficult.

Simple, alternative modalities for functional status assessments will aid the long-term follow-up of these patients post discharge. If FIM could be reliably assessed by a trained interviewer or via telephone, this would enable better utilisation of resources and medical personnel. It would also help address a key shortcoming of patients being lost to follow-up post discharge, as not all patients discharged home return for outpatient reviews.

Our study was not without limitations. We compared only the FIM motor scores of a group of stroke patients who had completed rehabilitation. Hence, the applicability of our data
is limited to assessments of functional recovery and coping. The results may not be valid for other patient populations, such as patients with cognitive or communication deficits, or those with low functional capacity. Though there was agreement in functional mobility scores, basic ADLs (e.g. eating, grooming) showed poor agreement and this finding concurred with the results of previous studies.\(^{(3)}\)

In conclusion, our study demonstrated modest agreement between patient self-reporting and multidisciplinary assessment of FIM motor scores as a measure of functional ability in stroke patients. Although patients tend to overrate their performance, our results suggest that patient self-reported FIM motor scores could be considered as an alternative in situations where a full multidisciplinary assessment may not be feasible. Future studies could ascertain the robustness of such patient self-reporting in the outpatient setting as well.

REFERENCES
Table I. Summary of FIM motor score assessments.

<table>
<thead>
<tr>
<th>Variable</th>
<th>FIM motor score (mean ± SD)</th>
<th>ICC (95% CI)</th>
<th>Agreement*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Multidisciplinary assessment</td>
<td>Patient self-reporting</td>
<td></td>
</tr>
<tr>
<td>Overall FIM motor score</td>
<td>66.91 ± 13.07</td>
<td>72.45 ± 11.85</td>
<td>0.651 (0.404–0.811)</td>
</tr>
<tr>
<td>Individual FIM motor item</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eating</td>
<td>6.48 ± 0.38</td>
<td>6.82 ± 0.39</td>
<td>−0.123 (−0.441 to 0.223)</td>
</tr>
<tr>
<td>Grooming</td>
<td>5.82 ± 1.26</td>
<td>6.39 ± 1.46</td>
<td>0.026 (−0.313 to 0.350)</td>
</tr>
<tr>
<td>Bathing</td>
<td>4.94 ± 1.32</td>
<td>6.15 ± 1.28</td>
<td>0.184 (−0.162 to 0.491)</td>
</tr>
<tr>
<td>Upper body dressing</td>
<td>5.67 ± 1.24</td>
<td>6.33 ± 1.16</td>
<td>0.431 (0.090–0.658)</td>
</tr>
<tr>
<td>Lower body dressing</td>
<td>4.94 ± 1.30</td>
<td>5.61 ± 1.90</td>
<td>0.370 (0.039–0.628)</td>
</tr>
<tr>
<td>Toileting</td>
<td>5.12 ± 1.36</td>
<td>5.52 ± 1.86</td>
<td>0.472 (0.163–0.698)</td>
</tr>
<tr>
<td>Bladder</td>
<td>5.30 ± 1.42</td>
<td>5.36 ± 2.04</td>
<td>0.488 (0.183–0.709)</td>
</tr>
<tr>
<td>Bowel</td>
<td>5.27 ± 1.57</td>
<td>5.76 ± 1.64</td>
<td>0.536 (0.245–0.740)</td>
</tr>
<tr>
<td>Wheelchair transfer</td>
<td>5.06 ± 1.22</td>
<td>5.61 ± 1.20</td>
<td>0.545 (0.256–0.745)</td>
</tr>
<tr>
<td>Toilet transfer</td>
<td>5.06 ± 1.09</td>
<td>5.39 ± 1.50</td>
<td>0.465 (0.154–0.694)</td>
</tr>
<tr>
<td>Shower transfer</td>
<td>4.97 ± 1.07</td>
<td>5.09 ± 1.33</td>
<td>0.563 (0.281–0.757)</td>
</tr>
<tr>
<td>Walking</td>
<td>4.70 ± 1.26</td>
<td>4.85 ± 1.42</td>
<td>0.586 (0.312–0.771)</td>
</tr>
<tr>
<td>Stair climbing</td>
<td>3.58 ± 1.58</td>
<td>3.58 ± 1.89</td>
<td>0.618 (0.357–0.791)</td>
</tr>
</tbody>
</table>

*ICC agreement categories were poor (range 0.00–0.40), fair (range 0.41–0.60), good (range 0.61–0.74) and excellent (range 0.75–1.00). CI: confidence interval; ICC: intraclass correlation; FIM: Functional Independence Measure; SD: standard deviation.
FIGURE

Fig. 1 Bland-Altman plot graph shows the agreement between the Functional Independence Measure motor scoring by multidisciplinary assessment and that by patient self-reporting.