

Rasch Analysis of Functional Independence Measure, Latvian Version

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Introduction. Functional Independence Measure (FIM) is one of the most commonly used instruments for assessing activity limitations for persons after stroke. It consists of 18 items: 13 – motor scale and 5 – social-cognitive items, and same 7-levels ordinal scale is used for each of the items. FIM has shown good psychometric properties of Traditional Test Theory. However, for the evaluation of characteristics of internal construct validity, item bias and the scaling properties of the instrument, the Rasch unidimensional measurement model should be applied.

Aim. The aim of the study is to investigate the psychometric properties using Rasch analysis of the FIM Motor administered in persons after stroke.

Material and methods. The data for this analysis were collected from archive of National Rehabilitation Centre “Vaivari”, from patients’ charts that received in-patient rehabilitation after stroke, during 2011 and were evaluated using FIM. The data of 217 in-patients was fitted to the Rasch model.

Results. The outcome of Likelihood ratio test was significant ($p < 0.05$) and the Partial-Credit Model was used for analysis. Initial summary statistical analysis showed good item-trait interaction (Chi-Square probability – 0.512) and good reliability indices of test (Person separation index – 0.976) and The Cronbach’s Alpha 0.981), but Item Fit Residual (0.763; SD 3.9403) and Person Fit Residual (– 0.514; SD 1.334) showed potential misfit to the model. Rescoring disordered thresholds of two items (“Eating” (0112234) and “Dressing lower body” (0123345)) slightly improved fit statistics.

Based on Residual correlation analysis for the determination of significant local dependency three subtests were created: Self-care (including Item 1 to Item 6); Sphincter Control (including Item 7 and Item 8); Mobility (including Item 9 to Item 13).

Creating subtests of the FIM significantly improved summary fit statistics to a satisfactory level – Item Fit Residual (0.257; SD 0.584) and Person Fit Residual (– 0.334; SD 0.813), but reduced reliability (Person separation index – 0.905; Cronbach’s Alpha – 0.981). Local dependency of items prevented from satisfactory unidimensionality of the scale.

Conclusion. FIM Motor Scale in Latvia applied for stroke patients undergoing rehabilitation, satisfies Rasch model expectations after the adjustment of local dependency issues. All included items form a unidimensional scale if divided in three subtests.