Developing a patient-reported outcome measure to assess recovery after abdominal surgery: Item analysis using Rasch Measurement Theory

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Key message: As surgery enters the era of patient-centered care, **PROMs** have become essential for measuring postoperative recovery. The RAAS score will help incorporate patients' perspectives and experiences into research and quality improvement initiatives in abdominal surgery.

Introduction

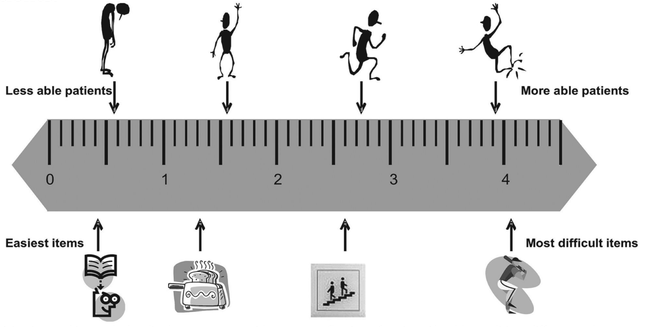
- In keeping with the principles of patient-centered care, patients' voice must be included in the measurement of **recovery after abdominal surgery** using **patient-reported outcome measures (PROMs).**
- Research supports that the PROM questionnaires currently used in this field have limited evidence supporting their measurement properties.
- To address this research gap, we initiated a research program to develop a conceptually relevant and psychometrically sound PROM to measure recovery after abdominal surgery; **the Recovery After Abdominal Surgery (RAAS) score**.
- Our preliminary qualitative works led to the development of a conceptual framework and the creation pool of 59 recovery-related items/questions based on the International Classification of Functioning, Disability and Health (ICF).

Aim

To further develop the **Recovery After Abdominal Surgery (RAAS) score** by psychometrically evaluating the proposed items using **Rasch Measurement Theory.**

Methods

- In this prospective cohort study, **100 adult patients undergoing abdominal surgery** at three university-affiliated hospitals completed an electronic survey containing the preliminary RAAS 59-item pool preoperatively and at postoperative days (PODs) 1, 7, 30, and 90.
- Item responses will be assessed using **Rasch analysis** (via RUMM2030 software), a statistical method that uses various diagnostic criteria (i.e., error estimates and fit statistics) to select the best items and create an accurate scoring algorithm for the final questionnaire.
- This analysis will produce an interval (rather than ordinal) scale that simultaneously accounts for the difficulty of the items and the ability of patients.



Using interval instead of ordinal measures provides a true reflection of patients' health condition, differences between individuals and groups, and treatment effects. From: Vanhoutte EK, et al. Rasch-ionale for neurologists. J Peripher Nerv Syst 2015; 20: 260-268.

Preliminary results

- Between October 2021 and September 2022, 192 patients were screened for eligibility, 151 met inclusion criteria, and 100 consented to participation (characteristics described in the table below).
- Response rates were 97% preoperatively, 93% on POD1, 91% POD7, 91% POD30, 87% POD90.
- Rasch analysis of responses to the RAAS 59-item pool is currently underway.

Characteristic	N = 100
Mean age, years (SD)	57 (14.7)
≤ 60 years	53
≥ 61 years	47
Female	49
Surgery extension*	
Moderate	34
Major	34
Extended Major	32
Surgical diagnosis	
Oncology	51
Non-oncology	49

*Classified according to Copeland GP et al (1991) POSSUM: A scoring system for surgical audit. Br J Surg 78(3):355-60.
-Moderate surgeries include: appendectomies, cholecystectomies, hernia repairs; major surgeries: colonic resections, gastrectomies, nephrectomies, hysterectomies; major extended surgeries: rectal, pancreatic & liver resections.

Future Directions

The next phases of this research program include the development of computer adaptive testing for RAAS (to reduce response burden) and user-friendly electronic platforms (mobile app and web portal) for data collection.