

Appraisal

Clinimetrics: Patient-Reported Outcomes Measurement Information System (PROMIS®)

Summary

Description: The Patient-Reported Outcomes Measurement Information System (PROMIS®) consists of a universal, non-disease-specific, applicable set of instruments that have been designed to measure patient-reported health across different adult and paediatric (patient) populations in a more efficient way than traditional patient-reported outcome measures (PROMs).^{1,2} The PROMIS instruments have been developed using Item Response Theory and consist of item banks. An item bank is a large (20 to 100+) set of items (questions) with responses (answers) measuring one common domain (construct) (eg, physical functioning, pain interference, fatigue or depression).² PROMIS instruments can be applied as Short Forms or computer adaptive tests (CATs).² Short Forms consist of a fixed number of 4 to 10 highly informative items out of the bank. CATs consist of computer-administered tests that, supported by an Item Response Theory-based algorithm, present items based on the responses to previous items. Consequently, patients respond to a small and flexible number (about 3 to 7) of highly informative and relevant items. PROMIS instruments, applied as Short Forms or CATs, are relatively short and the administration time is much less compared with traditional PROMs. In summary, PROMIS consists of a universally applicable set of instruments that measure health efficiently and are less burdensome to patients.

Psychometric properties and score interpretation: PROMIS instruments have been carefully developed in collaboration with patients and experts to ensure content validity.² The CAT application results in an estimate of the patient score with high precision (reliability). The

PROMIS instrument scores are standardised and expressed as T-scores. A score of 50 generally represents the mean score of the general population with a standard deviation of 10, enabling easy interpretation.³ Moreover, clinically relevant classifications of PROMIS T-scores have been suggested for some PROMIS instruments (eg, T-score thresholds for severity levels like 'within normal limits', 'mild problems', 'moderate problems', and 'severe problems'). PROMIS Short Forms can be administered on paper or in digital format and are free of charge. The total score has to be converted to a T-score using a conversion table that is available in the manual at issue⁴ or by uploading the response data to the online HealthMeasures Scoring Service. PROMIS CATs can, at a fee, be administered by computer or app and are scored automatically.² As shown above, PROMIS instruments have better content validity and are more precise than traditional PROMs, and their scores are easily interpretable.

Example: The PROMIS Physical Function (PROMIS-PF) item bank is an example of a PROMIS instrument that measures the domain physical functioning.⁵ This domain is highly relevant to physiotherapists and their patients. PROMIS-PF Short Forms have shown stronger content validity, higher precision, and other desirable psychometric properties compared to traditional PROMs such as the Short Form-36 Health Survey Physical Functioning scale and the Health Assessment Questionnaire-Disability Index.⁶ Sufficient psychometric properties of the bank have been shown in patients receiving physiotherapy.⁷

Commentary

An advantage of PROMIS is that its domain framework is comprehensive and comprises physical, mental and social health, and includes domains that are highly relevant to patients with different (chronic) health conditions.² Another advantage is its universal applicability, as patients increasingly have multiple conditions. Other advantages are their sound psychometric properties, broad measurement range, and small floor and ceiling effects. PROMIS scores are also easy to interpret and can be used to compare (patient) populations. PROMIS instruments were developed in the United States and have been translated into over 40 languages.² PROMIS instruments are increasingly being used and implemented in clinical practice and research worldwide.⁸ However, the main advantage of PROMIS instruments is that they take much less time to administer than other PROMs without compromising their psychometric properties.

Limitations: The disadvantages of PROMIS CATs are the need to use a computer or an app and the fees related to the use of CATs. Also, the responsiveness of PROMIS instruments has not yet been extensively studied.

Overall, applying PROMIS Short Forms and the highly efficient PROMIS CATs in clinical practice and research is considered feasible, with little administration time, and has the potential for standardised and routine patient monitoring across a wide range of disorders, including patients receiving physiotherapy.

Provenance: Invited. Not peer reviewed.

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