ESTABLISHING MINIMAL IMPORTANT DIFFERENCE FOR PROMIS SCORES IN PATIENTS FOLLOWING TREATMENTS OF ROTATOR CUFF TEARS

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Purpose: To evaluate disease severity and different treatment options, many Patients Report Outcome measures (PROs) are developed and applied. The Patient-Reported Outcomes Measurement System (PROMIS) is a widely used PRO for patients with shoulder disorders. Through comparing the change of PROMIS scores for a patient before and after treatment, clinicians can learn whether the patient’s condition is improved. However, only knowing the difference of two scores does not provide sufficient evidence to inform research and clinical practice. To correctly interpret the difference of scores, we need to know how the patients perceive those differences of score. Minimal important difference (MID) analysis is used to determine whether a change or difference in the PROMIS is large and important enough to the patients to warrant a change in treatments. The definition of MID is “the smallest difference in scores of a patient report outcome (PRO) measure that is perceived by patients as beneficial or harmful, and which would lead the clinician to consider a change in treatment”. Having an MID for a PRO measure will assist the healthcare professionals to better interpret the treatment outcomes, thus improve the effectiveness of healthcare services. The objectives of this study were to (1) establish MIDs for the PROMIS upper extremity score using both anchor- and distribution-based techniques; (2) investigate the associations between baseline predictors and the MID.

Methods: We conducted a prospective cohort study including 26 RCT patients. This study was approved by the University of Michigan Internal Review Board. All the included patients signed an informed consent. Their PROMIS scores were collected at baseline and 6-month after treatments. We applied a distribution-based approach and an anchor-based approach to estimate the MID. The distribution-based MID estimation was calculated using 1/2 standard deviation (SD) estimate obtained by dividing the SD of baseline PROMIS score by 2. In estimating the anchor-based MID, a global change questionnaire was used at the 6-month follow-up to identify the patients who perceived a minimal important change. Then we calculated the change of PROMIS scores for those patients after treatments and generated an anchor-based MID estimation. In addition, we conducted permutation tests for simple linear regression to investigate the associations between the patients’ demographic, treatment, and comorbidity characteristics and the anchor-based MID.

Results: There were 26 patients included in the distribution-based MID analyses. The MIDs derived from distribution-based method estimates for PROMIS score was 3.41. The anchor-based MID analysis included 6 patients who indicated a minimal important improvement. The MIDs estimated using the anchor-based method for PROMIS score was 5. The results of linear regression analyses indicated that baseline PROMIS score ($\beta = -0.573$, p-value = 0.013) and gender ($\beta = -5.867$, p-value = 0.029) have significant associations with the anchor-based MID of PROMIS.
Conclusion: In this study, we used both distribution-based and anchor-based methods to estimate the MID for PROMIS score. According to our estimation, the range of MID for PROMIS score is between 3.41 and 5. This result can be used to indicate whether a score change is important to the patients. For example, if a patient’s PROMIS score increases by 10 after 6 months of treatment. Since it is higher than the MID, based on our estimation, it represent the patient has an important improvement after the treatment. Through regression analyses, we also found that baseline score and gender are negatively associated with the MID. The results showed that for each one unit increase in the baseline PROMIS score, the MID decreases 0.573, and females have a 5.867 higher average MID comparing to males. Therefore, female RCT patients and patients with a lower baseline score generally consider a larger improvement of their PROMIS score as minimally important.