

PROMIS Physical Function Scores in Cases of Cardiology and Rheumatology were Altered by the Use of Subdomain-Specific Item Sets

Objectives: The Case- Reported issues Measurement Information System (PROMIS) physical function (PF) item bank has been developed to regularize case- reported PF across medical fields. Still, substantiation of scoring parity across cardiology and rheumatology cases is still missing. thus, this study aims to probe both (1) the extent of complaint- related discriminational item performing (DIF) and (2) the impact of the complaint group on using subdomain-specific item sets for generating PROMIS PF scores in cardiology and rheumatology cases.

Study Design and Setting: Ordinal retrogression was used to estimate DIF between cardiology (n = 201) and rheumatology (n = 200) convalescents. To explore the complaint-specific impact of PF subdomains on scoring, we compared scores deduced from the full item bank with scores deduced from subdomain-specific item sets for each complaint group.

Results: DIF was detected in 18 particulars, predominately from the upper extremity subdomain. When upper extremity particulars were used, cardiology cases reached totally advanced scores than using the full item bank. Rheumatology cases scored mainly advanced when mobility particulars were used.

Conclusion: Applying the PROMIS PF metric to complaint-specific item sets including particulars from differing subdomains may lead to prejudiced comparisons of PF situations across complaint groups. Disease-specific item parameters should be handed for particulars showing DIF, and subdomain- related content balancing is recommended for scoring the general PROMIS PF construct.

Keywords: PROMIS • Physical function • Differential item functioning • Cardiology • Rheumatology • Case- reported issues • Health issues • Assessment • Scoring parity

Introduction

Physical function (PF) has come one of the most important case- reported outgrowth (PRO) disciplines in colourful medical fields, including cardiology and rheumatology. Numerous traditional PF measures include particulars particularly applicable to a specific medical field. While PF measures for cases with cardiovascular conditions generally concentrate on mobility (e.g., walking), measures for cases with musculoskeletal diseases, similar as the Stanford Health Assessment Questionnaire disability indicator, generally include particulars for the

assessment of upper extremity functioning. Because of similar details of individual PF measures, scores are generally not formalized by using an instrument-independent metric. Therefore, case- reported PF can frequently not be compared across medical fields when traditional instruments are applied.

Recent developments in PRO exploration are aimed at prostrating problems of community across patient populations by moving toward construct- grounded rather than instrument- grounded assessment. Item response proposition (IRT) styles can be used to calibrate any number of particulars

Nehal El-Ghobashy*

Department of Rheumatology, Faculty of Medicine, Cairo University, Egypt

***Author for Correspondence:**

Ghobashy@gmail.com

Received: 02-Jan-2023, Manuscript No.

fmijcr-23-86550; **Editor assigned:** 04-

Jan-2023, Pre-QC No. fmijcr-23-86550

(PQ); **Reviewed:** 17-Jan-2023, QC No.

fmijcr-23-86550; **Revised:** 21-Jan-

2023, Manuscript No. fmijcr-23-86550

(R); **Published:** 28-Jan-2023, DOI:

10.37532/1758-4272.2023.18(1).001-003

measuring the same idle construct on a common metric, performing in an IRT- calibrated item bank. Similar item banks generally include particulars applicable to colourful patient populations of interest, allowing for comparisons of scores across different customized item subsets similar as population-specific short forms. Also, IRT estimation enables motorized adaptive testing (CAT) that is, the automatized individualization of administered particulars during assessment.

One end of developing the PROMIS PF item bank was to regularize case- reported PF across different patient populations. Still, it's noteworthy that the original publication of the PROMIS PF item bank indicated implicit complaint- related discriminational item performing (DIF), particularly between cases with cardiovascular conditions and cases with rheumatic conditions. DIF means that the statistical relationship between an item and the underpinning PF construct isn't independent from the specific patient population. Therefore, particulars affected by DIF are generally not considered to be suitable for measuring a general PF construct across different populations. To date, still, scoring parity across different medical fields, similar as cardiology and rheumatology, has hardly been delved. The only substantiation we set up was grounded on samples that had been used for original item estimation of the bank.

This is the first study to totally explore complaint-related DIF of PROMIS PF between cases with cardiovascular conditions and cases with rheumatic conditions, grounded on patient responses to the full set of 121 PROMIS PF particulars. Also, the impact of complaint group on using subdomain-specific item subsets for scoring the general PROMIS PF construct is examined [1, 2].

Materials and Method

The PROMIS physical function item bank

PROMIS defines PF as an existent's capability “to carry out conditioning that bear physical conduct, ranging from tone- care (conditioning of diurnal living) to more complex conditioning that bear a combination of chops, frequently within a social environment. For the development of PROMIS PF, an expansive item identification and evaluation process was conducted, performing in a general item bank covering four subdomains mobility, central regions (back and neck), upper extremity, and necessary conditioning of diurnal living (IADL). Good psychometric parcels of PROMIS PF have been demonstrated in a wide range

of populations and for different language performances. Lately, the PROMIS PF item bank v1.2 was restated and culturally acclimated to German.

Data collection and sample size

The German PROMIS PF item bank was administered as paper- grounded questionnaires to two inpatient samples at Charité – Universitätsmedizin Berlin, Germany. Data were collected at the Clinic for Cardiology and Angiology (“cardiology sample”) and Department of Rheumatology and Clinical Immunology (“rheumatology sample”) between July and November 2015. Potentially eligible cases (≥ 18 times) were given written information about the study and asked to give spoken concurrence. Successive data collection was carried out until a sample size of $n = 200$ per clinic were reached. A sample size of $n = 200$ per group has been suggested to be acceptable for probing DIF between subpopulations using logistic retrogression analysis [3, 4].

Discussion

This study showed that cases with cardiovascular conditions and cases with rheumatic conditions responded totally different to 15 of PROMIS PF particulars, predominately from the upper extremity sphere. Also, using item subsets related to different PF subdomains led to different PROMIS PF T- scores, indicating multidimensionality.

Considerable DIF was detected in nearly half of upper extremity particulars, indicating that performing fine motor conditioning is easier for cardiology compared with rheumatology cases. While rheumatology cases were youngish and more likely to be women, our analysis didn't indicate that complaint- related DIF could be explained by age- or gender- related goods. In agreement with complaint- related DIF, cardiology cases showed mainly advanced scores when only upper extremity particulars were used for scoring, compared to full bank scores. In discrepancy, rheumatology cases reached lower scores when upper extremity particulars were used but advanced scores when mobility particulars were used. These findings indicate that mobility and upper extremity are distinct subdimensions which are else associated with complaint groups.

We also set up subdomain- related goods on scoring which appeared to be independent from complaint group. Both rheumatology and cardiology cases scored advanced when particulars related to central regions were used but lower when IADL particulars were used. These findings suggest that these PF disciplines might be distinct subdimensions as well, potentially affecting

PROMIS PF comparisons between other clinical populations. Therefore, farther studies are demanded probing dimension parity of PROMIS PF particulars across other health conditions [5, 6].

This study has limitations. First, we used data from only one sanitarium in Germany. Compared with other rheumatology conventions, a comparably high number of rheumatology convalescents at Charité suffer from connective tissue diseases, potentially affecting the generalizability of the findings. Second, our sample size was too small to compare individual groups within separate medical fields. For illustration, it would be intriguing to compare rheumatology cases with upper extremity problems and cases with musculoskeletal impairments in other body corridor. Therefore far, only one study seems to have explored DIF within a medical field. Third, we didn't collect any data from cases that refused to share in the study because of data protection reasons. Therefore, nonresponder bias wasn't delved. Fourth, we used the original PROMIS PF metric,

which is grounded on English-speaking samples from the U.S. To German data [7, 8]. As language-related DIF between U.S. and German samples has not been delved for the full PROMIS PF item bank, we cannot be sure whether language-related goods told our findings. still, former studies probing dimension invariance of PROMIS measures (including PROMIS PF particulars) between German and English-speaking samples didn't indicate language- or culture-related DIF. also, the German PROMIS PF item bank was set up to be conceptually original to the English interpretation in another study. Therefore, it seems veritably doubtful that the complaint group – affiliated findings of this study could be explained by language-related goods [9, 10].

Acknowledgement

We thank croakers Lacassagne, Erika Sifuentes and Parichat Khaosut.

Conflict of Interest

None.

References

1. Hays RD, Revicki DA, Feeny D *et al.* Using Linear Equating to Map PROMIS (®) Global Health Items and the PROMIS-29 V2.0 Profile Measure to the Health Utilities Index Mark 3. *Pharmacoeconomics.* 34, 1015-22 (2016).
2. Pennings JS, Khan I, Davidson CA *et al.* Using PROMIS-29 to predict Neck Disability Index (NDI) scores using a national sample of cervical spine surgery patients. *Spine J.* 20, 1305-1315 (2020).
3. Huang W, Rose AJ, Bayliss E *et al.* Adapting summary scores for the PROMIS-29 v2.0 for use among older adults with multiple chronic conditions. *Qual Life Res.* 28, 199-210 (2019).
4. Wright MA, Adelani M, Dy C *et al.* What is the Impact of Social Deprivation on Physical and Mental Health in Orthopaedic Patients? *Clin Orthop Relat Res.* 477, 1825-1835 (2019).
5. Cella D, Choi SW, Condon DM *et al.* PROMIS® Adult Health Profiles: Efficient Short-Form Measures of Seven Health Domains. *Value Health.* 22, 537-544 (2019).
6. Ulrich CK, Baker KK, Carpenter PA *et al.* Fatigue in Hematopoietic Cell Transplantation Survivors: Correlates, Care Team Communication, and Patient-Identified Mitigation Strategies. *Transplant Cell Ther.* 22, 1803-1806 (2022).
7. Farhadfar N, Weaver MT, Al-Mansour Z *et al.* Self-Efficacy for Symptom Management in Long-Term Adult Hematopoietic Stem Cell Survivors. *Transplant Cell Ther. Sep;* 28, 6061-6068 (2022).
8. Kurosawa S, Yamaguchi T, Mori A *et al.* Prognostic Impact of Pretransplantation Quality of Life and Its Post-Transplantation Longitudinal Change after Allogeneic Hematopoietic Cell Transplantation: A Prospective Study That Administered the Short-Form Health Survey (SF-12) and EuroQol 5. *Transplant Cell Ther.* 27, 935-935 (2021).
9. Bronwen E Shaw, Karen L Syrjala, Lynn E Onstad *et al.* PROMIS measures can be used to assess symptoms and function in long-term hematopoietic cell transplantation survivors. *Cancer.* 124,841-849 (2018).
10. Elsmann EBM, Roorda LD, Smidt N *et al.* Measurement properties of the Dutch PROMIS-29 v2.1 profile in people with and without chronic conditions. *Qual Life Res.* 31, 3447-3458 (2022).