Estimating Minimally Important Differences on PROMIS Domain Scores

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"Distribution-Based" Methods

 Change in PROMIS domain score theta that is equal to a "prior" for the minimally important change

$$-0.5^*SD_b = 5$$

 $-0.2^*SD_b = 2$

- Standard error of measurement (SEM) = $SD_b \times \sqrt{1 r_{xx}}$
 - SD_b = standard deviation at baseline r_{xx} = reliability

"Anchor-based" Estimates of MID

- Anchor used to classify respondents in terms of change
- Estimate PROMIS domain score delta for subgroup that changed by a minimally important amount on anchor

Since the start of the study, how would you describe the change (if any) in << symptom X, severity of condition>>?



- Moderately better
- A little better
- No change
- □ A little worse
- Moderately worse
- Much worse

MID

Other Anchors

- Improvement in global rating item of one level
- x% (e.g., 50%) reduction in
 - Joint swelling
 - Joint tenderness
 - Hamilton Depression (HAM-D) scores

"Initial Validation of PROMIS Physical Function/Disability Scales in Rheumatoid Arthritis" (Fries et al.)

- 19 out of the 20 items in the 20-item PROMIS physical functioning short-form
 - "Are you able to wash your back?" excluded.
- Three waves of data
 - -Baseline (n = 521)
 - -6 months post-baseline (n = 483)
 - One year post-baseline (n = 472)

Retrospective Ratings of Change in RA Study

- Change in activity (CHG_ACTIVITY)
- Change in fatigue (CHG_FATIGUE)
- Change in pain (CHG_PAIN)
 - Got a lot better
 - -Got a little better
 - Stayed the same
 - Got a little worse
 - Got a lot worse

SF-36 Retrospective Change Item

- Compared to one year ago, how would you rate your health in general now? (HT)
 - Much better now than one year ago
 - Somewhat better now than one year ago
 - About the same as one year ago
 - Somewhat worse now than one year ago
 - Much worse now than one year ago

Global Rating of Physical Functioning

- To what extent are you able to carry out your everyday physical activities such as walking, climbing stairs, carrying groceries, or moving a chair? (GLOBAL06)
 - Completely
 - -Mostly
 - Moderately
 - -A little
 - Not at all

Minutes Spent Exercising

- Vigorous exercise
- Aerobics
- Biking
- Racquet sports
- Swimming
- Other exercises

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Correlations of Anchor with Change in PROMIS Physical Functioning Domain

	PF ₂ - PF ₁	$PF_3 - PF_2$	$PF_3 - PF_1$
 Activity 	0.26 (0.29)	0.34 (0.33)	
 Pain 	0.27 (0.28)	0.30 (0.30)	
 Fatigue 	0.20 (0.21)	0.23 (0.24)	
 Overall health 			0.21(0.23)
 Δ Global PF 	0.17 (0.19)	0.20 (0.20)	
 Δ Min. exercise 	0.10 (0.07)	0.08 (0.06)	

Note: Product moment correlations presented, followed by Spearman rank-order correlations (in parentheses)

Change in PROMIS Physical Functioning (W2 - W1) by Retrospective Ratings of Change (n = 463)

 $PF_{1} = 40.19 (SD = 9.18); PF_{2} = 39.81 (SD = 9.44)$ F (4, 458 dfs) = 9.41, p<.0001(Activity) F (4, 457 dfs) = 4.68, p=.0010(Fatigue) F (4, 457 dfs) = 9.81, p<.0001(Pain)

	Activity	Fatigue	Pain n
- Got a lot better:	+ 0.94 ^a	0.94 ^a	1.25 ^a (19-21)
– Got a little better:	+ 0.65 ^a	0.54 ^a	0.50 ^a (41-61)
– Stayed the same:	- 0.04 ^{a,b}	- 0.16 ^{a,b}	0.02 ^{a,b} (224-258)
– Got a little worse:	- 1.31 ^b	- 1.06 ^{b,c}	- 1.16 ^b (107-126)
- Got a lot worse:	- 3.19 ^c	- 2.06 ^c	- 3.12 ^c (28-32)

Change in PROMIS Physical Functioning (W2 - W1) by Change in Global PF (n = 465)

F (4, 460 dfs) = 3.86, p = .0043

	Global PF	n
-2+ levels better:	0.53 ^a	22
– <u>1 level better</u> :	0.32 ^a	68
- Stayed the same:	- 0.31 ^{a,b}	273
– <u>1 level worse</u> :	- 1.52 ^b	60
-2+ levels worse:	- 1.39 ^b	42

Change in PROMIS Physical Functioning (W3 - W2) by Retrospective Rating of Change in Activity (n = 443)

 $PF_2 = 39.95 (SD = 9.24); PF_3 = 39.81 (SD = 9.60)$

F (4, 438 dfs) = 14.98, p<.0001 (Activity)

F (4, 438 dfs) = 6.32, p<.0001 (Fatigue)

F (4, 437 dfs) = 11.34, p<.0001 (Pain)

	Activity	Fatigue	Pain	n
- Got a lot better:	+ 3.26 ^a	2.24 ^a	3.38 ^a ((16-20)
- Got a little better:	+ 1.96 ^{a,b}	1.67 ^{a,b}	1.31 ^b	(33- 55)
- Stayed the same:	0.43 ^{b,c}	0.38 ^{b,c}	0.40 ^{b,c}	(211-245)
- Got a little worse:	- 0.82 ^c	- 0.48 ^{c,d}	- 0.79 ^{c,d}	(114-138)
– Got a lot worse:	- 3.16 ^d	- 1.94 ^d	- 2.28 ^d	(29-31)
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Change in PROMIS Physical Functioning (W3 - W2) by Change in Global PF (n = 439)

 $PF_2 = 40.19 (SD = 9.18); PF_3 = 39.81 (SD = 9.44)$ F (4, 434 dfs) = 4.70, p = 0.0431

	Global PF	n
-2+ levels better:	1.84 ^a	27
– <u>1 level better</u> :	0.54 ^{a,b}	74
– Stayed the same:	0.25 ^b	235
– <u>1 level worse</u> :	- 0.86 ^{b,c}	77
-2+ levels worse:	- 1.67 ^c	26

Change in PROMIS Physical Functioning (W3 - W1) by Retrospective Rating of Change, Overall Health (n = 451)

 $PF_1 = 40.18 (SD = 9.03); PF_3 = 39.91 (SD = 9.54)$ F (4, 446 dfs) = 13.34, p<.0001

- Much better (n = 38):	1.26 ^a
— <u>Somewhat better (n = 221)</u> :	0.29 ^a
About the same (n = 39):	- 2.57 ^b
– <u>Somewhat worse (n = 34)</u> :	1.45 ^a
– Much worse (n = 119):	- 1.51 ^b

Questions



