

Comparison of PROMIS-29 and PROMIS Global Physical and Mental Health Scores

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Patient-Reported Outcomes Measurement Information System (PROMIS®)

Self-report measures assessing physical, mental, and social health in adults and children.

Used with the general population and with those with chronic conditions

T-score metric

Mean = 50, SD = 10; U.S. general population

PROMIS[®] Adult Profile Domains

Physical Health

- Physical function
- Pain
 - Interference
 - Intensity
- Fatigue

Mental Health

- Emotional distress
 - Depressive symptoms
 - Anxiety
- Pain
 - Interference
 - Intensity
- Fatigue
- Sleep disturbance

Social Health

- Ability to participate in social roles & activities



PROMIS® Adult Profile Domains

Global Health

In general, how would you rate your health?

Physical Health

- Physical function
- Pain
 - Interference
 - Intensity
- Fatigue

Mental Health

- Emotional distress
 - Depressive symptoms
 - Anxiety
- Pain
 - Interference
 - Intensity
- Fatigue
- Sleep disturbance

Social Health

- Ability to participate in social roles & activities



Domains and Items

- PROMIS Global Health Scale
 - Global Physical Health (4 items)
 - Global Mental Health (4 items)
- PROMIS-29 (29 items) Profile
 - Physical function, pain interference, pain intensity
 - Depressive symptoms, Anxiety, Fatigue, Sleep disturbance
 - Ability to participate in social roles/activities

Global Health Scale Items

- Physical health
 - In general, how would you rate your physical health?
 - To what extent are you able to carry out your everyday physical activities?
 - How would you rate your pain on average?
 - How would you rate your fatigue on average?
- Mental health
 - In general, how would you rate your mental health?
 - In general, would you say your quality of life is?
 - In general, how would you rate your satisfaction with social activities and relationships?
 - How often have you been bothered by emotional problems?

PROMIS-29

- 4 items each
 - Physical function
 - Pain interference
 - Depressive symptoms
 - Anxiety
 - Fatigue
 - Sleep disturbance
 - Ability to participate in social roles and activities
- Pain intensity (0–10 numeric rating item)

PROMIS Internet Panel Samples

- Op4G (Sample 1) & Toluna/Greenfield (Sample 2)
- n = 3,000 (2,000)
- 51% (50%) female
- 60% (81%) non-Hispanic White
 - 17% (6%) Hispanic, 14% (7%) Black, 9% (4%) Asian
- Mean age = 46 (52); range: 18-93 years old
- 14% (3%) less than high school
- 57% (56%) married or living with a partner

Internal Consistency Reliability

Measure	Sample 1	Sample 2
Physical function	0.91	0.93
Pain interference	0.94	0.86
Anxiety	0.90	0.91
Depressive Symptoms	0.93	0.95
Fatigue	0.91	0.95
Sleep Disturbance	0.77	0.88
Ability to Participate in Social Roles and Activities	0.93	0.96

PROMIS-29 Physical and Mental Health Summary Scores

- 1. Physical functioning (4 items)
- 2. Pain
 - Pain intensity (1 item) and pain interference (4 items)
- 3. Emotional distress
 - Depressive symptoms (4 items) and Anxiety (4 items)
- 4. Fatigue (4 items)
- 5. Sleep disturbance (4 items)
- 6. Ability to participate in social roles and activities (4 items)

- Physical health summary score
- Mental health summary score

Physical and Mental Health Summary Scores (Factor Scoring Coefficients)

ph29_z =

$$\begin{aligned} & (\text{phy4a_z} * 0.872) + & (\text{painav_z} * -0.094) + \\ & (\text{social4a_z} * 0.113) + & (\text{fatig4a_z} * -0.009) + \\ & (\text{slpd4a_z} * 0.002) + & (\text{emot_z} * 0.003) \end{aligned}$$

$$\text{ph29_T} = (\text{ph29_z} * 10) + 50$$

mh29_z = (

$$\begin{aligned} & \text{phy4a_z} * -0.015) + & (\text{painav_z} * -0.154) + \\ & (\text{social4a_z} * 0.252) + & (\text{fatig4a_z} * -0.351) + \\ & (\text{slpd4a_z} * -0.139) + & (\text{emot_z} * -0.257) \end{aligned}$$

$$\text{mh29_T} = (\text{mh29_z} * 10) + 50$$

Physical Health

- Global
 - In general, how would you rate your physical health?
 - To what extent are you able to carry out your everyday physical activities?
 - How would you rate your pain on average?
 - How would you rate your fatigue on average?
- PROMIS-29
 - Physical function, ability to participate in social roles and activities, pain

Mental Health

- Global
 - In general, how would you rate your mental health?
 - In general, would you say your quality of life is?
 - In general, how would you rate your satisfaction with social activities and relationships?
 - How often have you been bothered by emotional problems?
- PROMIS-29
 - **Fatigue**, emotional distress, ability to participate in social roles and activities, **pain**, and **sleep disturbance**

PROMIS-29 Physical and Mental Health Summary Scores in Sample 1 (Opt4g)

Variable	Mean	SD	Minimum	Maximum
PROMIS-29 Physical	46.32	9.23	21.60	62.45
PROMIS-29 Mental	45.66	9.49	19.53	62.34
PROMIS Global Physical	44.84	9.40	16.04	67.69
PROMIS Global Mental	46.55	9.70	21.13	67.64

Note: First two rows are summary scores for PROMIS-29; last two rows are PROMIS global health scale scores.

PROMIS-29 Physical and Mental Health Summary Scores in Sample 2 (Toluna/Greenfield)

Variable	Mean	SD	Minimum	Maximum
PROMIS-29 Physical	48.63	8.95	22.27	61.92
PROMIS-29 Mental	50.20	9.16	20.44	62.24
SF-36v2 PCS	46.12	11.24	8.27	69.38
SF-36v2 MCS	47.68	12.34	-3.59	71.70

Note: First two rows are summary scores for PROMIS-29; last two rows are SF-36 physical component summary (PCS) and mental component summary (MCS) scores.

Neville et al. (2022)

- Patients with severe COVID-19 six months after a hospital intensive care admission.
- PROMIS physical health scores
 - 45 (PROMIS-29)
 - 47↑ (PROMIS Global)
- PROMIS mental health scores
 - 50 (PROMIS-29)
 - 43↓ (PROMIS Global)

Current Study

- Amazon's Mechanical Turk (MTurk)
 - Baseline (n = 5804)
 - 3-months later (n = 1972)
 - 6-months later (n = 1077)
- Ipsos's KnowledgePanel (KP)
 - Baseline (n = 4060)



Means Scores on PROMIS Physical and Mental Health Scores in MTurk

Condition (% of sample)	PROMIS-29 Mental	Global Mental
Anxiety (28%)	44	41↓
Depression (35%)	45	42↓
COPD (5%)	43	46↑
Heart Attack (5%)	43	49↑
Heart disease (5%)	43	49↑
Stroke (4%)	43	48↑
Overall sample	50	47↓

Note: Arrows indicate differences between corresponding PROMIS-29 and PROMIS global health scores of 3 or more T-score points. Overall sample n = 5804

Means Scores on PROMIS Physical and Mental Health Scores in KP

Condition (% of sample)	PROMIS-29 Mental	Global Mental
Anxiety (20%)	45	42↓
Depression (20%)	45	42↓
Cholesterol (38%)	52	49↓
Overall sample	53	49↓

Note: Arrows indicate differences between corresponding PROMIS-29 and PROMIS global health scores of 3 or more T-score points. Overall sample n = 4060

Multitrait-Multimethod Correlation Matrix Among PROMIS Physical and Mental Health Scores in MTurk and KP

MTurk	PROMIS-29		PROMIS Global	
MTurk Baseline	Physical	Mental	Physical	Mental
P-29 Physical	1.00			
P-29 Mental	0.68	1.00		
Global Physical	0.69	0.74	1.00	
Global Mental	0.21	0.56	0.55	1.00
MTurk 3-Months				
P-29 Physical	1.00			
P-29 Mental	0.67	1.00		
Global Physical	0.76	0.72	1.00	
Global Mental	0.31	0.63	0.54	1.00
MTurk 6-Months				
P-29 Physical	1.00			
P-29 Mental	0.68	1.00		
Global Physical	0.81	0.76	1.00	
Global Mental	0.36	0.69	0.55	1.00
KnowledgePanel				
P-29 Physical	1.00			
P-29 Mental	0.68	1.00		
Global Physical	0.76	0.75	1.00	
Global Mental	0.37	0.66	0.60	1.00

MTurk baseline correlations in top third (*n*'s range from 5717-5846; median *n* = 5724). 3-month

Correlations of Change Between Baseline and 3 Months Later in Physical and Mental Health Scores in the MTurk Back Pain Subsample

PROMIS-29

PROMIS Global

Change	Physical	Mental	Physical	Mental
P-29 Physical	1.00			
P-29 Mental	0.46	1.00		
Global Physical	0.41	0.45	1.00	
Global Mental	0.23	0.36	0.42	1.00

Note: n = 1031

PROMIS Global Physical Versus PROMIS-29 Mental Health

- PROMIS Global Physical
 - In general, how would you rate your physical health?
 - To what extent are you able to carry out your everyday physical activities?
 - How would you rate your pain on average?
 - How would you rate your fatigue on average?
- PROMIS-29 Mental
 - Fatigue, emotional distress, ability to participate in social roles and activities, pain, and sleep disturbance

Summary

- The PROMIS Global Mental Health Scale has been found to yield less positive mean T-scores than the PROMIS-29 mental health summary score.
- Correlations between the PROMIS-29 mental health summary score are larger with the PROMIS global physical health scale than with the PROMIS global mental health scale.
- Interpretations of mental health scores depend on which PROMIS measure (global or PROMIS-29) is used.
- Differences in item content appear to account for differences.
- Additional research is needed to evaluate when the PROMIS global mental health scale yields less positive scores than the PROMIS-29 mental health summary score.

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