# ADULT PAIN INTERFERENCE VERSION 1.0 SHORT FORM

A brief guide to the 6-item PROMIS Short Form v1.0 – Pain Interference 6b

## ABOUT PAIN INTERFERENCE*

The pain interference item bank measures the self-reported consequences of pain on relevant aspects of one's life. This includes the extent to which pain hinders engagement with social, cognitive, emotional, physical, and recreational activities. Pain interference also incorporates items probing sleep and enjoyment in life, though the item bank only contains one sleep item. The pain interference short form is generic rather than disease-specific. It assesses pain interference over the past seven days.

(*abbreviated definition: *see nihpromis.org for the full version*)

## INTRODUCTION TO ASSESSMENT OPTIONS

There are two administration options for assessing pain interference: short forms and computerized adaptive testing (CAT). When administering a short form, instruct participants to answer all of the items (i.e., questions or statements) presented. With CAT, participant responses guide the computer's choice of subsequent items from the full item bank (41 items in total). Although items differ across respondents taking CAT, scores are comparable across participants. Some administrators may prefer to ask the same question of all respondents or of the same respondent over time, to enable a more direct comparability across people or time. In these cases, or when paper administration is preferred, a short form would be more desirable than CAT.

This guide provides information on the six-item pain interference version 1.0 short form. The strength of the six-item version 1.0 instrument lies in its focus on item content and its ability to assess the full range of pain interference measured by the pain interference item bank. When selecting a short form, the main difference is instrument length. Reliability and precision of short forms within a domain are highly similar. Longer short forms generally offer greater correlation (strength of relationship) with the full item bank, as well as greater precision. If you are working with a sample in which you expect large variability in a domain and you want to include the full range of item content from that domain, you would probably prefer this six-item version 1.0 short form. On the other hand, if you are hoping to capture secondary outcomes data, but have little room for additional measures, you would probably prefer a very brief (four-item) profile short form.

When choosing between CAT and a short form, it is useful to consider the demands of computer-based assessment, and the psychological, physical, and cognitive burden placed on respondents as a result of the number of questions asked. Longer CAT offers greater correlation with the full item bank, as well as greater precision. When evaluating precision, not all questions are equally informative. The flexibility of CAT to choose more informative questions offers more precision.

Whether one uses a short form or CAT, the score metric is based upon Item Response Theory (IRT), a family of statistical models that link individual questions to a presumed underlying trait or concept of pain interference represented by all items in the item bank.

Graphical reports, which visually illustrate results, are available in Assessment Center if you choose to administer a PROMIS Profile, which includes a profile short form from seven PROMIS domains (physical function, depression, anxiety, pain interference, fatigue, sleep disturbance, and satisfaction with participation in social roles). To access a sample report, complete the CAT demo at nihpromis.org.

## SCORING THE INSTRUMENT

**Pain Interference 6b**
*Short Form Conversion Table*

| Raw Score | T-score | SE* |
|---|---|---|
| 6 | 41.0 | 6.0 |
| 7 | 48.5 | 2.6 |
| 8 | 50.8 | 2.1 |
| 9 | 52.5 | 1.9 |
| 10 | 53.8 | 1.8 |
| 11 | 55.0 | 1.7 |
| 12 | 56.1 | 1.7 |
| 13 | 57.1 | 1.7 |
| 14 | 58.1 | 1.7 |
| 15 | 59.1 | 1.6 |
| 16 | 60.0 | 1.6 |
| 17 | 60.9 | 1.6 |
| 18 | 61.8 | 1.6 |
| 19 | 62.7 | 1.6 |
| 20 | 63.6 | 1.6 |
| 21 | 64.5 | 1.6 |
| 22 | 65.5 | 1.6 |
| 23 | 66.4 | 1.6 |
| 24 | 67.4 | 1.7 |
| 25 | 68.5 | 1.7 |
| 26 | 69.6 | 1.8 |
| 27 | 70.9 | 1.9 |
| 28 | 72.4 | 2.1 |
| 29 | 74.4 | 2.4 |
| 30 | 78.3 | 3.7 |

*SE = Standard Error on T-score metric

Table 1

Each question has five response options ranging in value from one to five. To find the total raw score, sum the values of the response to each question. For example, for the six-item form, the lowest possible raw score is 6; the highest possible raw score is 30 (Table 1).

You can use Table 1 to translate the total raw score into a T-score for each participant. The T-score rescales the raw score into a standardized score with a mean of 50 and a standard deviation (SD) of 10. Therefore, a person who has a T-score of 40 is one SD below the U.S. general population mean. These conversions are accurate ONLY when all questions on the short form have been answered. For the 6-item form, a raw score of 18 converts to a T-score of 61.8 with a standard error (SE) of 1.6. Thus, the 95% confidence interval around the actual observed score ranges from 58.7 to 64.9 (T-score $\pm$ (1.96*SE) = 61.8 $\pm$ 3.1 = 58.7 to 64.9).

**Important:** *A higher PROMIS T-score represents more of the concept being measured*. For negatively-worded concepts like pain interference, a T-score of 60 is one SD worse than average. By comparison, a pain interference T-score of 40 is one SD better than average.

You can upload data to a free computer program called PROMIScore, which will score your data one person at a time or as a group. PROMIScore is particularly useful because it can calculate T-scores even when there are missing responses. The PROMIScore software and user manual are available for download at nihpromis.org.

## STATISTICAL CHARACTERISTICS

There are three key features of the score for pain interference:

- **Reliability**: The degree to which a measure is free of error. It can be estimated by the internal consistency of the responses to the measure, or by correlating total scores on the measure from two time points when there has been no true change in what is being measured (for z-scores, reliability = $1 - SE^2$).
- **Precision**: The consistency of the estimated score (reciprocal of error variance).
- **Information:** The precision of an item or multiple items at different levels of the underlying continuum (for z-scores, information = $1/SE^2$).

The final score is represented by the T-score, a standardized score with a mean of 50 and a standard deviation (SD) of 10.

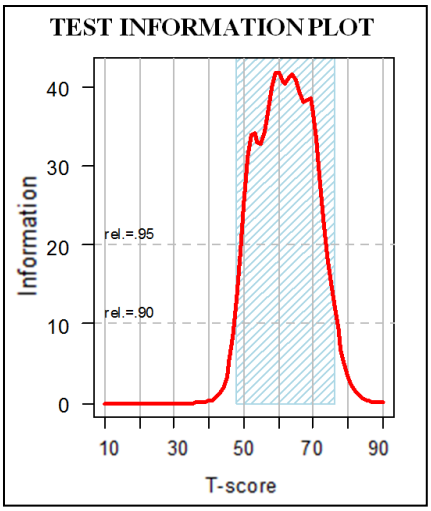
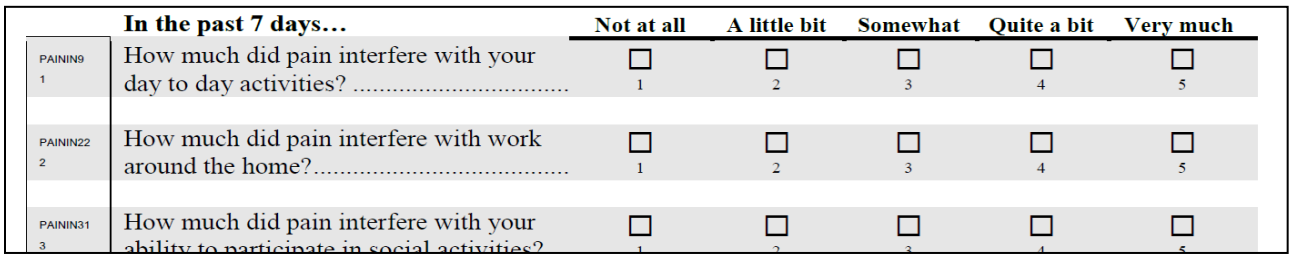



Figure 1

In Figure 1, the two dotted horizontal lines each represent a degree of internal consistency reliability (i.e., .90 or .95) typically regarded as sufficient for an accurate individual score. The shaded blue region marks the range of the scale where measurement precision is comparable to the reliability of .90 for the six-item form. Figure 1 also tells us where on the scale the form is most informative based upon the T-score. This form would typically be more informative than a pain interference form with fewer items.

## PREVIEW OF SAMPLE ITEMS

Figure 2 is an excerpt from the paper version of the six-item short form. This instrument is also available for online administration. There are a variety of formatting options for the online version.



| | In the past 7 days… | Not at all | A little bit | Somewhat | Quite a bit | Very much |
|---|---|---|---|---|---|---|
| PAININ9 1 | How much did pain interfere with your day to day activities? ..... | ☐ 1 | ☐ 2 | ☐ 3 | ☐ 4 | ☐ 5 |
| PAININ22 2 | How much did pain interfere with work around the home?..... | ☐ 1 | ☐ 2 | ☐ 3 | ☐ 4 | ☐ 5 |
| PAININ31 3 | How much did pain interfere with your ability to participate in social activities? | ☐ 1 | ☐ 2 | ☐ 3 | ☐ 4 | ☐ 5 |

Figure 2

## FREQUENTLY ASKED QUESTIONS

### Q: *I am interested in learning more. Where can I do that?*

This short form is available on the PROMIS website through Assessment Center, which houses all PROMIS instruments for each domain.

Assessment Center is a free online research management tool. It enables researchers to create study-specific websites for capturing participant data securely. Studies can include measures within the Assessment Center library, as well as custom instruments created or entered by the researcher. PROMIS instruments (short forms, CAT, profiles) are a central feature of the instrument library within Assessment Center. Any PROMIS measure can be included in an online study or downloaded for administration on paper. Figure 2 is an excerpt from a paper short form for investigators.

Detailed statistical information and development history about PROMIS items and instruments are available for review at nihpromis.org or assessmentcenter.net. To learn more, contact help@assessmentcenter.net.

### Q: *Do I need to register with PROMIS to use this short form?*

Yes, to get a copy of this short form, we ask that you register with Assessment Center, so that we are better able to track who has accessed instruments for research. Assessment Center is available at assessmentcenter.net, along with the terms and conditions of use.

### Q: *Is this short form available in other languages?*

Yes, this short form is currently available in Spanish. The PROMIS group is also working to translate this form into other languages. Information on available translations is updated periodically at nihpromis.org.

### *Q: Can I make my own short form?*

Yes, custom pain interference short forms can be made by selecting any items from the item bank. Instructions can be found in the Assessment Center user manual. The full item bank is available at assessmentcenter.net.