

ADULT SLEEP DISTURBANCE COMPUTERIZED ADAPTIVE TESTING (CAT)

A brief guide to the PROMIS Item Bank v1.0 – Sleep Disturbance

ABOUT SLEEP DISTURBANCE*

The sleep disturbance item bank assesses self-reported perceptions of sleep quality, sleep depth, and restoration associated with sleep. This includes perceived difficulties and concerns with getting to sleep or staying asleep, as well as perceptions of the adequacy of and satisfaction with sleep. Sleep disturbance does not focus on symptoms of specific sleep disorders, nor does it provide subjective estimates of sleep quantities (total amount of sleep, time to fall asleep, amount of wakefulness during sleep). Sleep disturbance CAT is generic rather than disease-specific. It assesses sleep disturbance over the past seven days.

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

PREVIEW OF SAMPLE ITEMS

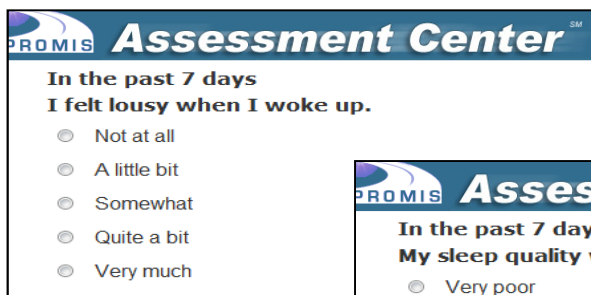


Figure 1

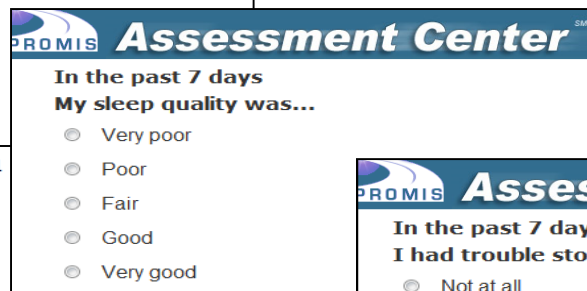
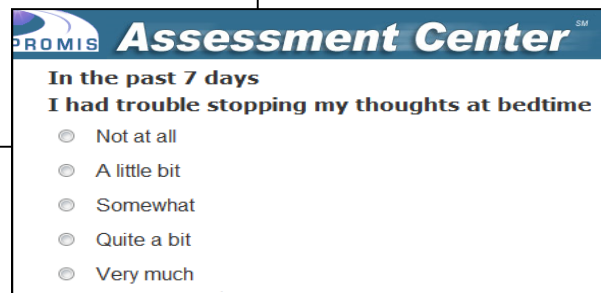


Figure 1 shows three sleep disturbance items (i.e., questions or statements) from the full item bank that can be included in CAT. Several formats for presenting the items are available for computer-based administration through Assessment Center (see FAQ on page 3). CAT is not available for paper administration.



SCORING THE INSTRUMENT

A minimum number of items (4) must be answered in order to receive a score for sleep disturbance CAT. The first item is selected because it provides the most information about the U.S. general population. The response to this item will guide the computer's choice of the next item for the participant. The participant's response to this item will dictate the selection of the following question, and so on. As additional items are administered, the potential for error is reduced and confidence in the respondent's score increases. CAT will continue until either the standard error drops below a specified level, or the participant has answered the maximum number of questions (12), whichever occurs first.

After finishing CAT, the participant's pattern of responses is converted into a standardized T-score, with a mean of 50 based on the U.S. general population, and a standard deviation (SD) of 10. Thus, a person who has a T-score of 40 is one SD below the U.S. mean. The standardized T-score is reported as the final score for each participant.

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

STATISTICAL CHARACTERISTICS

Figure 2 is a sample of the statistical information available in Assessment Center. Two key features are:

1) **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 = $1 - SE^2$).

Scaling Model Used For Calibration	Graded Response Model (GRM)
Total Number of Items	27

Sample	N	Alpha Reliability
Sleep Calibration	2252	0.97

2) **Standard Error (SE):** The possible range of the actual final score based upon the scaled T-score. With a T-score of 52 and a SE of 2, the 95% confidence interval around the actual final score ranges from 48.1 to 55.9 (T-score \pm (1.96*SE) = $52 \pm 3.9 = 48.1$ to 55.9).

Score Distributions									
	Mean	SD	P5	P10	P25	P50	P75	P90	P95
Raw	60.73	23.88	30.00	33.00	40.00	56.00	78.00	96.00	105.00
Scale	49.78	10.30	33.44	36.49	42.09	49.42	57.22	63.40	66.51

										Min	Max
Scale Score	10.0	20.0	30.0	40.0	50.0	60.0	70.0	80.0	90.0	10.0	90.0
SE	2.30	.90	.40	.20	.20	.20	.20	.30	.60		
Reliability	.00	.16	.87	.96	.97	.97	.97	.92	.68		

Note: SEs in Figure 2 are on the theta metric; multiply values by 10 to get SEs on the T-score metric. Figure 2

More information is available online via Assessment Center (assessmentcenter.net).

DATA REPORTS

Upon completion of CAT, a data report is available in Assessment Center. Figure 3 is a sample report:

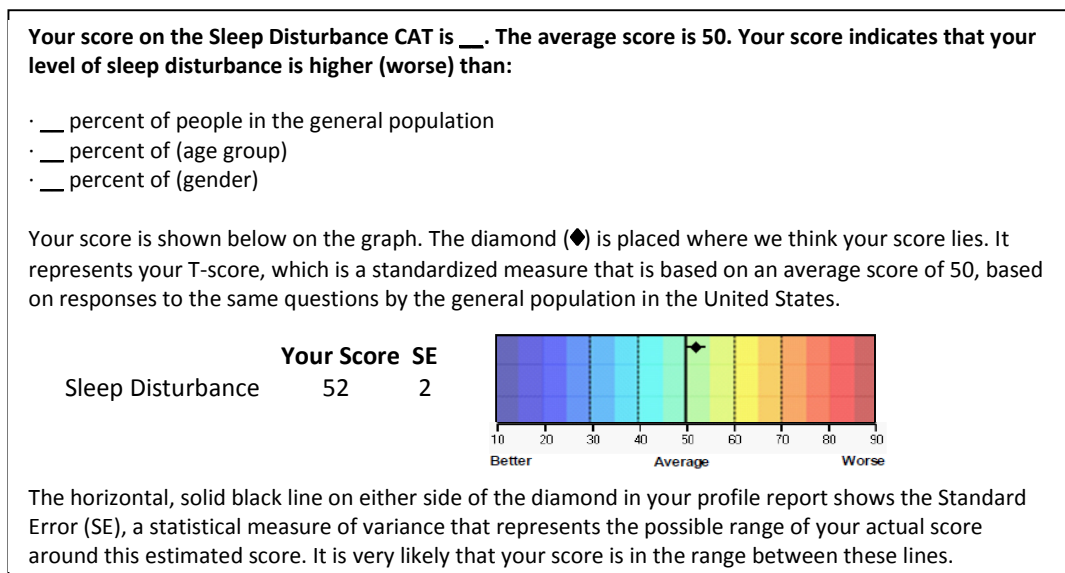


Figure 3

To access a sample report for sleep disturbance, complete the CAT demo at nihpromis.org. More than one CAT domain can be completed at a time; the generated report will contain all completed domains.

Data reports are also available if you choose to administer a PROMIS profile instrument, which includes a short form from seven PROMIS domains (physical function, depression, anxiety, fatigue, pain interference, satisfaction with participation in social roles, and sleep disturbance).

COMPARING COMPUTERIZED ADAPTIVE TESTING TO SHORT FORMS

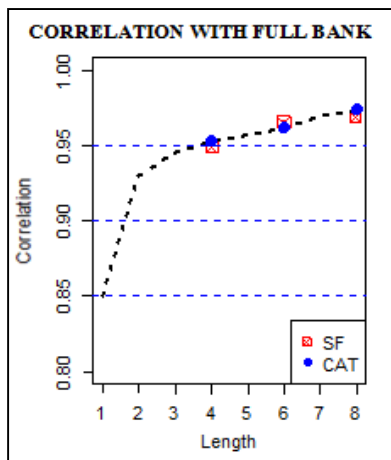


Figure 4

There are two administration options for assessing sleep disturbance: short forms and CAT. With a short form, participants will be administered all of items within the instrument. With CAT, participant responses guide the computer's choice of subsequent items from the full item bank (27 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.

Figure 4 illustrates the correlations (strength of relationship) of the full bank with CAT and with short forms of varying length (4, 6 and 8 items).

The correlation of CAT scores with the full bank score is similar to a short form of any length. A longer CAT or longer short form offers greater correlation, 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 Item Response Theory (IRT), a family of statistical models that link individual questions to a presumed underlying trait or concept (sleep disturbance) represented by all items in the item bank. 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.

FREQUENTLY ASKED QUESTIONS

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

The full version of this item bank 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 non-adaptive administration on paper.

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 CAT?

Yes, to gain access to this CAT, we ask that you register with Assessment Center and endorse the terms and conditions of use, so that we are better able to track who has accessed instruments for research. Assessment Center is available at assessmentcenter.net.

Q: Is this CAT available in other languages?

This CAT is not currently available in other languages. The PROMIS group is working to translate this CAT into Spanish and other languages. Information on available translations is updated periodically at nihpromis.org.