Advancing Behavioral Health Measurement

The PROMIS® Smoking Assessment Toolkit

Research studies and clinical practice related to smoking often focus on assessing patient status in clearly defined domains, such as nicotine dependence, craving, and withdrawal. Although there are many different questionnaires available for assessing smokers' standing in these domains, the quality, availability, and length of these questionnaires vary considerably, and there are no widely accepted recommendations for their use. This situation has presented challenges for both researchers and clinicians who want to use the most efficient and effective assessment tools. The smoking research field has lacked a comprehensive assessment system that provides widespread access to a well-defined set of reliable and valid scales for measurement in core domains (such as nicotine dependence) and offers clear guidance for their use. The absence of a standardized and systematic approach to measurement has made it difficult, for example, to uncover commonalities across studies that could advance understanding of what drives people to smoke and what might help them become more ready to quit.

This research highlight describes the RAND PROMIS® Smoking Initiative, which involves the development and dissemination of a comprehensive smoking assessment toolkit to address this need. In the short run, the availability of this toolkit means that researchers have access to "off-the-shelf" instruments to efficiently and reliably measure smokers' standing in core smoking domains. As use of this toolkit increases, measurement of smoking-related domains will become more standardized and precise, researchers will be able to compare findings more directly across smoking studies, and the relationships between scores in these core domains and critical smoking outcomes (such as length of abstinence or number of recent quit attempts) will become clearer. The PROMIS Smoking Initiative is part of the broader Patient-Reported Outcomes Measurement Information System (PROMIS) program, an ongoing effort funded by the National Institutes of Health to develop, validate, and standardize groups of survey items ("item banks") to measure symptoms and health domains relevant to a range of chronic conditions.

Developing the Smoking Assessment Toolkit

To develop the toolkit, the RAND team first conducted a systematic literature review, drawing on the many available questionnaires in the smoking research field, to identify an initial pool of over 1,500 smoking-related questions. After obtaining this initial set of questions, the team removed questions that were not central to the domains of interest, redundant, or not applicable to the target population of current adult smokers. The team then conducted focus groups and cognitive interviews with current smokers to ensure the relevance of questions and identify and remove problematic questions. An expert panel provided ongoing feedback throughout this process. At the end of this formative phase, 277 smoking questions remained for field testing. These questions were administered to a nationally representative sample of 5,384 smokers with no concrete plans to quit in the near future. Responses from the field test provided the basis for a series of psychometric analyses to (1) identify sets of questions for the item banks in the smoking assessment toolkit and (2) evaluate the item banks' performance.

Key Facts About the Toolkit

- The smoking assessment toolkit is composed of six item banks that represent distinct domains of interest to cigarette smoking research: nicotine dependence, coping expectancies, emotional and sensory expectancies, health expectancies, psychosocial expectancies, and social motivations for smoking (see definitions in the table).

Key findings:

- The PROMIS Smoking Initiative developed an assessment toolkit that enables researchers and clinicians to measure current adult smokers' standing in domains of central importance to smoking research, including nicotine dependence; using smoking to cope with stress; and smokers' expectations of the emotional and sensory effects, health effects, and social effects of smoking.

- The assessment toolkit can be used for both daily and nondaily smokers and performs similarly across these two smoker types.

Item Banks in the PROMIS Smoking Assessment Toolkit

Item Bank Name	Number of Items Full Bank	Short Form	Brief Description	Example Item
Nicotine Dependence	27	4 and 8*	Assesses cravings, or withdrawal that occurs upon brief cessation of smoking; smoking temptations; compulsive use; and tolerance	"When I run out of cigarettes, I find it almost unbearable"
Coping Expectancies of Smoking	15	4	Assesses the use of smoking as a means of coping with negative affect and stress	"I rely on smoking to deal with stress"
Emotional and Sensory Expectancies of Smoking	16	6	Assesses perceptions of improved cognitive abilities, positive affective states, and pleasurable sensorimotor sensations due to smoking	"I feel better after smoking a cigarette"
Health Expectancies of Smoking	19	6	Assesses perceptions of current and long-term consequences of smoking on one's health	"Smoking is taking years off my life"
Psychosocial Expectancies of Smoking	16	6	Assesses feelings of social disapproval of smoking, normative values associated with smoking, and negative beliefs about one's appearance when smoking	"People think less of me when they see me smoking"
Social Motivations for Smoking	12	4	Broadly assesses the expected social benefit of smoking and the social cues that induce cigarette craving	"Smoking makes me feel better in social situations"

* There are two short forms for the nicotine dependence item bank: one with four items and one with eight.

- Researchers have a variety of options for assessing smokers' standing in the six domains:
  - They can use subsets of questions preselected by the PROMIS Smoking Initiative (called "short forms"). For most domains, these short forms consist of four to seven questions and have reliabilities above 0.80 (the generally recommended minimum).
  - They can choose tailored subsets of questions from the item banks to explore specific content and then assess the reliability of the selected questionnaire.
  - They can use computer adaptive tests (CATs) to tailor administration to each respondent. CAT administration maximizes reliability while minimizing the number of questions each person has to answer.
- Preliminary validity evidence for the six domains is encouraging: Smokers' domain scores are associated with smoking and quitting patterns and are also related to smokers' standing in measures of physical and mental health functioning (i.e., health-related quality of life; see the PROMIS Smoking Initiative project website [http://www.rand.org/health/projects/promis-smoking-initiative.html] for more details). For example:
  - Nicotine dependence is most strongly associated with quantity of smoking and time to first cigarette of the day.
  - Health and psychosocial expectancies are most related to quitting recency and interest, and coping expectancies are strongly associated with anxiety.
- The assessment toolkit can be used for both daily and nondaily smokers and performs similarly across these two smoker types.

Concluding Observations

The progress of smoking-related research has long been hindered by an overabundance of measurement tools of varying quality and usefulness. To increase the availability and use of a common set of standardized assessment tools that in the long term will enhance the comparability of findings across studies examining smoking-related domains, the PROMIS Smoking Initiative has developed an assessment toolkit that enables precise and efficient measurement of current adult smokers' standing in six domains of central importance to smoking research.

Several features have been incorporated into the toolkit to make these tools an attractive option for researchers and clinicians:

- The assessments are designed to be very brief (thus requiring minimal effort from respondents) while still maintaining a high standard of scientific quality in terms of measurement precision.
- The toolkit is flexible, with a number of options for administration and scoring to meet the needs of researchers and practitioners.
- The tools are freely available, readily accessible, and easy to use.

The toolkit components are available for download from the PROMIS Smoking Initiative project website, which also provides more background and psychometric information on the smoking assessment toolkit and links to published papers on the topic.

PROMIS Smoking Initiative project website:
http://www.rand.org/health/projects/promis-smoking-initiative.html

This research highlight summarizes RAND Health research reported in the following publications:

Edelen MO, "The PROMIS® Smoking Assessment Toolkit—Background and Introduction to Supplement," *Nicotine & Tobacco Research*, Vol. 16, Supplement 3, September 2014, pp. S170–S174 (EP-66128, www.rand.org/t/EP66128).

Edelen MO, Stucky BD, Hansen M, Tucker JS, Shadel WG, and Cai L, "The PROMIS® Smoking Initiative: Initial Validity Evidence for Six New Smoking Item Banks," *Nicotine & Tobacco Research*, Vol. 16, Supplement 3, September 2014, pp. S250–S260 (EP-66129, www.rand.org/t/EP66129).

Edelen MO, Tucker JS, Shadel WG, Stucky BD, and Cai L, "Toward a More Systematic Assessment of Smoking: Development of a Smoking Module for PROMIS®," *Addictive Behaviors*, Vol. 37, No. 11, November 2012, pp. 1278–1284 (EP-201200-171, www.rand.org/t/EP201200171).

Edelen MO, Tucker JS, Shadel WG, Stucky BD, Cerully J, Li Z, Hansen M, and Cai L, "Development of the PROMIS® Health Expectancies of Smoking Item Banks," *Nicotine & Tobacco Research*, Vol. 16, Supplement 3, September 2014, pp. S223–S231 (EP-66127, www.rand.org/t/EP66127).

Hansen M, Cai L, Stucky BD, Tucker JS, Shadel WG, and Edelen MO, "Methodology for Developing and Evaluating the PROMIS® Smoking Item Banks," *Nicotine & Tobacco Research*, Vol. 16, Supplement 3, September 2014, pp. S175–S189 (EP-66130, www.rand.org/t/EP66130).

Shadel WG, Edelen MO, Tucker JS, Stucky BD, Hansen M, and Cai L, "Development of the PROMIS® Coping Expectancies of Smoking Item Banks," *Nicotine & Tobacco Research*, Vol. 16, Supplement 3, September 2014, pp. S202–S211 (EP-66131, www.rand.org/t/EP66131).

Shadel WG, Edelen MO, Tucker JS, Stucky BD, Hansen M, and Cai L, "Development of the PROMIS® Nicotine Dependence Item Banks," *Nicotine & Tobacco Research*, Vol. 16, Supplement 3, September 2014, pp. S190–S201 (EP-66132, www.rand.org/t/EP66132).

Stucky BD, Edelen MO, Tucker JS, Shadel WG, Cerully J, Kuhfeld M, Hansen M, and Cai L, "Development of the PROMIS® Negative Psychosocial Expectancies of Smoking Item Banks," *Nicotine & Tobacco Research*, Vol. 16, Supplement 3, September 2014, pp. S232–S240 (EP-66136, www.rand.org/t/EP66136).

Tucker JS, Shadel WG, Edelen MO, Stucky BD, Kuhfeld M, Hansen M, and Cai L, "Development of the PROMIS® Social Motivations for Smoking Item Banks," *Nicotine & Tobacco Research*, Vol. 16, Supplement 3, September 2014, pp. S241–S249 (EP-66135, www.rand.org/t/EP66135).

Tucker JS, Shadel WG, Edelen MO, Stucky BD, Li Z, Hansen M, and Cai L, "Development of the PROMIS® Positive Emotional and Sensory Expectancies of Smoking Item Banks," *Nicotine & Tobacco Research*, Vol. 16, Supplement 3, September 2014, pp. S212–S222 (EP-66134, www.rand.org/t/EP66134).

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