



Development of a Dynamic Assessment for Asthma Impact: Incorporating Consumer and Asthma Specialist Feedback



Diane M. Turner-Bowker, PhD¹, Renee N. Saris-Baglana, PhD¹, Michael A. DeRosa, MA¹, Christine A. Paulsen, PhD²
¹QualityMetric Incorporated, ²American Institutes for Research

Background:

- Research was conducted as part of a broader initiative to develop a single comprehensive ASTHMA-CAT assessment that combines asthma impact, asthma control, and generic health-related quality of life (HRQOL) measures in one administration, yielding patient, provider, and aggregate feedback reports.
- A prototype computerized adaptive test (CAT) to measure the impact of asthma on HRQOL, the DYNHA Asthma Impact Survey (DYNHA AIS), was piloted in a disease management population and found to reduce response burden while providing equally precise scores as compared to the full AIS item bank. However, findings also indicated the need for wider coverage of the functional impact of asthma, including items with greater specificity in content, in order to precisely assess asthma patients at varying levels of severity, and to capture changes in impact due to treatment^{1,2}.
- Results from a literature review and focus group research³ were used to inform the construction of an expanded AIS item bank.

Objectives:

- Cognitive interviews were conducted to evaluate sources of response error in the expanded AIS that may affect results (e.g., problems that will reduce response reliability or change the meaning of responses), and to gather input for report development.
- An expert advisory panel of asthma specialists and researchers was convened to evaluate expanded AIS content and advise report development.

Research Design:

- 20 adults self-reporting asthma were sampled from a 3,000 member New England research panel database (see Table 1).
- The original AIS bank contained 37 items, which was expanded to include an additional 36 items based on prior focus group results³ (see sample items in Table 2).
- One-on-one semi-structured cognitive interviews were conducted with participants, who completed the expanded AIS (n=73) and evaluated it along with a sample patient feedback report (see Figure 1).
- Interviews were facilitated by a moderator using a standard interview guide, which required participants to "think aloud" as they read and answered each survey item^{4,5}.
- Data were content analyzed to summarize how participants comprehend, interpret, and recall item content; and to understand processes participants used for decision-making and response option selection.
- Participant input on the content coverage of the item bank and design of feedback reports were also summarized.
- An advisory panel (N=12) evaluated qualitative results, expanded AIS item bank content, and feedback report designs.

Results:

Expanded AIS Item Bank

- Most items and instructions were worded clearly, easily understood, and included a relevant recall period ("past 4 weeks").
- In instances when no recall period was specified, participants attempted to recall experiences over a much longer time period (sometimes years).
- Comprehension and decision processes were reduced when items contained:
 - multiple concepts (e.g., "school, work, or home")
 - vague terms (e.g., "non-work activities")
 - words with dual meaning (e.g., "lose control" -- of one's emotions or asthma?)
 - perceived irrelevant content (e.g., "lie down and rest")

Table 1. Participant Characteristics

Characteristic	Female (%)	Male (%)	Total (%)
Asthma Control	(N=20)		
Controlled	4 (20%)	2 (10%)	6 (30%)
Partially controlled	4 (20%)	2 (10%)	6 (30%)
Uncontrolled	8 (40%)	6 (30%)	14 (70%)
Age	(N=20)		
18-24 years	4 (20%)	1 (5%)	5 (25%)
25-34 years	3 (15%)	3 (15%)	6 (30%)
35-44 years	2 (10%)	2 (10%)	4 (20%)
45-54 years	3 (15%)	1 (5%)	4 (20%)
55-64 years	1 (5%)	0 (0%)	1 (5%)
Education Level	(N=20)		
High School or GED	1 (5%)	1 (5%)	2 (10%)
Some College	12 (60%)	3 (15%)	15 (75%)
College Graduate	4 (20%)	2 (10%)	6 (30%)
Postgraduate	1 (5%)	0 (0%)	1 (5%)
Race	(N=20)		
White	1 (5%)	0 (0%)	1 (5%)
Black	1 (5%)	1 (5%)	2 (10%)
Hispanic/Latino	1 (5%)	1 (5%)	2 (10%)
Asian	1 (5%)	0 (0%)	1 (5%)
Native American	1 (5%)	0 (0%)	1 (5%)
Other	1 (5%)	0 (0%)	1 (5%)
Marital Status	(N=20)		
Married	12 (60%)	3 (15%)	15 (75%)
Single	3 (15%)	2 (10%)	5 (25%)
Divorced	1 (5%)	0 (0%)	1 (5%)
Widowed	1 (5%)	0 (0%)	1 (5%)
Employment Status	(N=20)		
Employed	12 (60%)	3 (15%)	15 (75%)
Unemployed	3 (15%)	2 (10%)	5 (25%)
Retired	1 (5%)	0 (0%)	1 (5%)
On Disability	1 (5%)	0 (0%)	1 (5%)

Table 2. Expanded AIS Item Bank Sample Items

Content Area	Sample Item	Never	Rarely	Sometimes	Often	Very often
Cognitive	In the past 4 weeks, how often do your asthma make it difficult for you to think your asthma on other things?	None of the time	A little of the time	Some of the time	Most of the time	All of the time
Fatigue	In the past 4 weeks, how much of the time did your asthma do this to you: (a) made you feel tired or (b) made you feel exhausted?	None of the time	A little of the time	Some of the time	Most of the time	All of the time
Financial	In the past 4 weeks, how much of the time did your asthma do this to you: (a) made you feel that you were poor or (b) made you feel that you were poor because of your asthma?	None of the time	A little of the time	Some of the time	Most of the time	All of the time
Mental Health	In the past 4 weeks, how often did you feel that you were poor because of your asthma?	Never	Almost never	Sometimes	Very often	Always
Physical Function	In the past 4 weeks, how often has asthma made it difficult for you to: (a) walk or (b) exercise?	Never	Rarely	Sometimes	Very often	Always
Role Function	How often in the past 4 weeks did you miss work, school, or other daily activities because of your asthma?	Never	Almost never	Sometimes	Very often	Always
Sexual Function	In the past 4 weeks, how often has asthma limited your enjoyment of sexual activity?	Never	Rarely	Sometimes	Often	Always
Sleep	In the past 4 weeks, how often do you have trouble sleeping because of your asthma?	Never	Rarely	Sometimes	Often	Always
Social Function	How often in the past 4 weeks did you miss family, social, or leisure activities because of your asthma?	Never	Almost never	Sometimes	Very often	Always
Social Function - Family	In the past 4 weeks, how often did you miss family activities because of your asthma?	Never	Rarely	Sometimes	Very often	Always
Stigma	In the past 4 weeks, how often did you feel stigma because of your asthma?	None of the time	A little of the time	Some of the time	Most of the time	All of the time

Figure 1. Sample Patient Feedback Report

Figure 2. AIS Score Interpretation

For additional information, contact Dr. Diane Turner-Bowker at (401) 334-8800 or dtbowker@qualitymetric.com.

Citation:
Turner-Bowker DM, Saris-Baglana RN, DeRosa MA, Paulsen CA. Development of a Dynamic Assessment for Asthma Impact: Incorporating Consumer and Asthma Specialist Feedback. Poster presentation at the Society of Behavioral Medicine, 30th Annual Meeting, Montreal, Canada, April 22-25, 2009.

References

- Turner-Bowker DM, Saris-Baglana RN, Anatchkova MD, Mosen DM. Development and Preliminary Evaluation of a Computerized Adaptive Assessment for Asthma (ASTHMA-CAT™). Poster presented at the annual meeting of Academy Health, Boston, MA; June 26-28, 2005.
- Anatchkova M, Turner-Bowker DM, Mosen D, Bartley P, Ware J. Computerized Adaptive Assessment of Asthma Impact. Poster presented at the annual meeting of the Society of Behavioral Medicine, Boston, MA; April 13-16, 2005.
- Turner-Bowker DM, Saris-Baglana RN, DeRosa MA, Paulsen CA, Bransfield C. Participants' Experience of Asthma: Results from a Focus Group Study. Poster presented at the International Society for Pharmacoeconomics and Outcomes Research, 13th Annual International Meeting, Toronto, Canada, May 3-7, 2008.
- Ericsson KA, Simon HA. Protocol Analysis: Verbal Reports as Data. Cambridge (MA): The MIT Press, 1993.
- Sudman S, Bradburn N, Schwarz N. Thinking About Answers: The Application of Cognitive Processes to Survey Methodology. San Francisco (CA): Jossey-Bass, 1996.

- Interpretation improved when specific examples were provided ["...how often has asthma limited your ability to walk a short distance (e.g., 1 mile or less)?"].
- Response processes were hindered when item content did not apply to the individual (e.g., "participate in competitive sports"), or when response options were perceived as indistinguishable (e.g., "reduced a little" versus "somewhat reduced").

- When the response options "Strongly agree" to "Strongly disagree" or "Definitely true" to "Definitely false" were used, participants favored the former.

- Participants reported that the key health areas impacted by asthma were covered in the bank, but suggested other variables for assessment (treatment impact, specific asthma triggers).

Feedback Report

- Participants were interested in reports that showed their progress over time with sufficient score interpretation, and saw value in sharing results with their doctor.

- Scores shown in a graph were difficult for participants to correctly interpret; they preferred a simple table of possible score levels with associated interpretative text (see sample in Figure 2).

- When multiple scores were displayed in one report, participants were confused by inverse scores (e.g., high scores that mean good health on a generic measure and more impact/poor health on an asthma-specific measure).

- When multiple survey results are presented (e.g., generic and asthma-specific), participants preferred to be shown a single summary report first with optional links to help interpret individual scores.

- Participants suggested that AIS would be most useful for newly diagnosed asthmatics (i.e., for self-management), those who were in "denial" about the impact of asthma, or those who have trouble articulating the impact of asthma to their doctor.

- AIS would be more useful to participants if they could access it from home on a periodic basis.

Advisory Panel

- Panelists confirmed the adequacy of content coverage in the AIS bank; focused primarily on physical, role, and sleep domains; and recommended adding items related to sexual function (see sample in Table 2).

- Item-level additions and revisions were recommended.

- Panelists made suggestions for the report:
 - progress over time should be shown for as many time points as possible (include hyperlink to full score history)
 - more emphasis on the "What You Should Do" section with action steps for self-management
 - instructions for when to take the survey next
 - report design should take into account patient reading levels

Conclusion:

This research helped identify gaps in measurement, possible sources of survey response error, and areas for improvement in survey and report development. Incorporating input from patients and clinicians in the early stages of survey development should improve the construct validity of this patient-reported outcomes measure and enhance its practical application in healthcare.

Future Plan:

Next steps include a large-scale quantitative study to establish AIS item calibrations for this dynamic component of the ASTHMA-CAT. Reports will be programmed, and the final tool will be fielded in a clinical validation study.

This project was supported by NHLBI grant #5R44HL078252-03 and QualityMetric Incorporated.