THE HEALTH ASSESSMENT QUESTIONNAIRE©
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Introduction

The Health Assessment Questionnaire (HAQ) was developed originally in 1978 by James F. Fries, MD, and colleagues at Stanford University. It was designed to represent a model of patient-oriented outcome assessment. The HAQ has been administered and validated in patients with a wide variety of rheumatic diseases, including rheumatoid arthritis, osteoarthritis, juvenile rheumatoid arthritis, lupus, scleroderma, ankylosing spondylitis, fibromyalgia, and psoriatic arthritis. It has been applied to patients with HIV/AIDS, in studies of normal aging, and has also been employed in population-based studies, including the follow-up to the National Health and Nutrition Examination Survey (NHANES).

It is one of the first self-report functional status (disability) measures, and is widely used throughout the world. The HAQ has played a major role in many diverse areas such as prediction of successful aging, inversion of the therapeutic pyramid in rheumatoid arthritis (RA), quantification of NSAID gastropathy, development of risk factor models for osteoarthrosis, and examination of mortality risks in RA. The HAQ has become a de facto mandated outcome measure for clinical trials in rheumatoid arthritis and some other diseases. The initial paper, published in 1980 (Fries, Spitz et al. 1980), has been the most cited article in the rheumatology literature. Reviews in 1992, 1996, and 2003 review its history, and update the literature on its reliability, validity and applicability in multiple settings and languages (Ramey, Raynauld et al. 1992; Ramey, Fries et al. 1995; Bruce and Fries 2003).

Purpose

The HAQ was developed as a comprehensive measure of health outcome based on the five patient-centered dimensions (death, disability, discomfort, drug toxicity, and dollar costs). Because the full HAQ emanated from the rheumatology field, it sometimes has been characterized as a disease-specific instrument rather than having been adjudicated on the basis of its structure, content, and history of use. The HAQ has been and can be administered across diverse disciplines and in different cultures, with properly designed adaptations that do not impact its reliability and validity and should be considered a generic rather than a disease-specific instrument.

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Formats

Typically, the HAQ is administered in one of two different formats, the Short or 2-page HAQ or the Full HAQ. The Short HAQ has received the widest attention, the most frequent use, and is commonly identified in the literature as "the HAQ." It consists of the HAQ Disability Index (HAQ-DI), HAQ Pain Scale, which are core items in the HAQ that have not been changed since 1983, and the Patient Global Visual Analog Scale (VAS).

Overview

The Full HAQ was one of the first instruments purposely designed to capture prospectively and by protocol the longterm influence of chronic illness. In addition to disability and pain, the Full HAQ assesses drug side effects (toxicity), dollar costs, and collects demographic and health behavior data over a six-month period. The additional items have been used primarily for research purposes and are tailored and modified as required to address specific hypotheses or research questions by the Arthritis, Rheumatism, and Aging Medical Information System (ARAMIS).

Drug use is captured and updated regularly, and their associated side effects are classified according to severity and whether the drug was stopped. Dollar costs are divided into direct and indirect costs. Direct cost variables include hospitalizations, surgeries, nursing home care, physician and health worker visits, medications, laboratory tests, x-rays, aids and devices, non-traditional treatments, assistance with personal care and housework, transportation and any additional costs related to medical care. Utilization of these services is determined and converted into dollar amounts. Indirect costs are those associated with productive days lost for the employed, housewives, students and retired persons, and changes in lifestyle and activities for the patient and family. Other items address normal daily activities, employment status, marital status, living arrangements and health-related behaviors. Death, while obviously not a self-report outcome on the HAQ, is a requisite part of the conceptual model of patient outcome. In ARAMIS, this is accomplished with protocols that utilize the United States National Death Index.

Administration

The HAQ is usually self-administered, but can also be given face-to-face in a clinical setting or in a telephone interview by trained outcome assessors, and has been validated in all of these settings. In ARAMIS, the questionnaire is mailed to patients every six months, who are asked to complete it without additional instructions. The Full HAQ takes 20 to 30 minutes to complete. The HAQ-DI and the HAQ Pain Scale can be completed in approximately five minutes. Patients usually find the short HAQ entirely self-explanatory, and clarifications are seldom required. Follow-up phone calls are sometimes needed to obtain missing data or to clarify ambiguous responses in the high-quality research data applications.

The HAQ-DI

The HAQ-DI assesses the extent of the patient's functional ability. It has been widely used for research purposes in both experimental and observational studies, as well as in clinical settings. The HAQ-DI is sensitive to change and is a good predictor of future disability and costs. It has been shown to be reliable and valid in different languages and contexts. Test-retest correlations have ranged from 0.87 to 0.99. Correlations between interview and questionnaire format have ranged from 0.85 to 0.95. Validity has been demonstrated in literally hundreds of studies. There is consensus that the HAQ-DI possesses face and content validity. Correlations between questionnaire

or interview scores and task performance have ranged from 0.71 to 0.95 demonstrating criterion validity. The construct/convergent validity, predictive validity and sensitivity to change have also been established in numerous observational studies and clinical trials. The HAQ-DI has also demonstrated a high level of convergent validity based on the pattern of correlations with other clinical and laboratory measures (Fries, Spitz et al. 1982; Ramey, Raynauld et al. 1992).

The HAQ-DI is designed to assess the patient's USUAL abilities using their usual equipment over the PAST WEEK. Some patients have questioned whether their responses should reflect a particularly good or bad time, which is out of the time frame requested, because they feel that their response may be missing those times when their functional ability changes. However, by repeating the HAQ at specific and regular time intervals, patterns of function can be examined. Inquiring about these activities only when patients are feeling particularly good or bad would result in inaccurate and biased data.

The HAQ-DI is composed of 20 items. There are eight categories, each of which has at least two component questions:

1) Dressing and Grooming   5) Hygiene
2) Arising   6) Reach
3) Eating   7) Grip
4) Walking   8) Common Daily Activities

For each of the categories, patients report the amount of difficulty they have in performing two or three specific sub-category items, or also known as components, or component variables.

There are four possible responses for each sub-category item, or component, within a category:

0 = without ANY difficulty   2 = with MUCH difficulty
1 = with SOME difficulty   3 = UNABLE to do

Conventions for patient directions:

- Patients are instructed to respond idiomatically, using their own frame of reference. Thus, the ratings, SOME, MUCH, or USUAL, are deliberately not operationalized. For example, if a patient asks what "SOME" means, an appropriate response would be "Whatever you think 'SOME' means to you".

- If a sub-category item does not apply to a patient, e.g., they don't shampoo their hair, take tub baths, or reach for a heavy object above their heads, then they should leave the item(s) blank since the purpose is to obtain data about what they can do.

- If a patient uses aids or devices (e.g., crutches, jar openers, etc), then they should answer the questions based on their usual equipment or way of performing the activity. If they have no difficulty with a sub-category item when using aids or devices (see below), then they mark the "no difficulty" column.

- If a patient can open their own door but not for others, then they should respond in consideration of their own requirements.

Handling responses:

- If the patient's mark is between the response columns, then the score is the closest one. If it's directly between the two, use the higher one

- If all sub-category items are left blank, or if more than one response is given, then follow up with the patient is required.

Calculating the HAQ-DI.

The patient must have a score for at least 6 of the 8 categories. If there are less than 6 categories completed, a HAQ-DI cannot be computed, whether the missing categories are due to missing values or they do not apply to the respondent.

1. <u>Sum the eight category scores</u>*

   *A category score is determined from the highest score of the sub-categories, or components, in that category, *except when aids or devices are taken into account* (see below). For example, if there are three sub-category items (as in the category ARISING), and the patient responds with a 1, 2, and 0, respectively, to the three sub-category items, the score for the ARISING category will be a 2.

2. <u>Divide the sum by the number of categories answered (range - 6-8)</u>

   This yields a single disability index score from 0-3.

<u>Standard and Alternative Scoring methods.</u> The scoring variables and scoring rules permit the computation of two disability indices, the Standard Disability Index, which takes into account the use of aids and devices, and the Alternative Disability Index, which does not. For either of these, a disability index cannot be computed if the patient does not have scores for at least 6 of the 8 categories.

<u>Scoring with Use of AIDS OR DEVICES and/or HELP FROM ANOTHER PERSON</u>

The **Standard Disability Index,** or commonly referred to as the HAQ-DI, takes into account the patient's use of aids or devices or assistance in the scoring algorithm for a category. This is the preferred and traditional scoring method.

For each of the eight disability categories there is an AIDS OR DEVICES companion variable(s) that is used to record the type of assistance, if any, a patient uses for his/her usual activities.

HAQ-DI Category	Companion AIDS OR DEVICES item
DRESSING & GROOMING	Devices used for dressing (button hook, zipper pull, long handled shoe horn etc.)
ARISING	Built up or special chair
EATING	Built up or special utensils
WALKING	Cane walker, crutches
HYGIENE	Raised toilet seat, bathtub seat, bathtub bar Long handled appliances in bathroom
REACH	Long handled appliances for reach
GRIP	Jar opener (for jars previously opened.

Devices written in the "Other" sections or notes written next to any component questions are considered if they would be used for any of the stated categories. Permanent adaptations of the person's environment (e.g., changing faucets in the bathroom or kitchen, using Velcro closures on clothing) should also be counted as aids and devices.

In the ARAMIS experience, very few patients have reported "other" items, and when they have, it has usually been either a duplicate of an aid or device already on the list or they have listed something that does not count (e.g., a wrist splint). Thus, it is usually acceptable to exclude the "Other" option if desired.

Scoring AIDS OR DEVICES or help companion variables:

1. When there are **NO** aids or devices or help indicated for a category, the category's score is not modified.

2. When aids or devices or help ARE indicated by the patient, the score for the category item is raised from a 0 or a 1 to a 2, but if the patient's highest score for that sub-category is a 3, it stays a 3.

The assignment of devices to particular disability categories assumes that the devices are used only for their intended purposes, such that if a patient indicates that he/she uses a cane, it is presumed that they use the cane as an aid in walking. However, it is possible for that patient to use the cane as an aid in performing other activities. For example, the patient may check off the cane listed at the bottom of the page (or write "cane" under the "other" slot) and then write a little note in the margin stating that the cane is also used on a regular basis as an aid in helping them rise out of a chair and to rise off of the toilet. In such a case, the variables should be coded "1" to reflect the patient's use of a cane in these three areas of daily functioning. If unsure whether the patient is using one of the devices specified above for the purpose for which it is designed, the patient should be called for clarification of specific uses.

Scoring When Not Using AIDS OR DEVICES and/or HELP FROM ANOTHER PERSON

The **Alternative Disability Index** is calculated without taking into account the use of AIDS OR DEVICES. It is calculated by adding the scores for each of the categories and dividing by the number of categories answered. This yields a score between 0 to 3.0.

There are specific circumstances where the alternative score would be preferable, such as when an investigation's goal is to increase the use of aids and devices. If aids and devices were taken into account, scoring would be biased, and findings would indicate that the study increased HAQ disability scores.

HAQ Pain Scale

The HAQ pain scale is designed to assess the presence or absence of arthritis-related pain and its severity over the PAST WEEK. The objective is to obtain information from patients on how their pain has USUALLY been over the past week, even though pain may be reported to vary over the course of a day or from day to day.

Pain is measured on a double-anchored VAS (a horizontal line where each end represents opposite ends of a continuum) that is standardized to 15 centimeters in length; the length is convenient for the page and for the patient. It is labeled 0=no pain at the left anchor point and 100=severe pain at the right anchor point. Patients are instructed to place a vertical mark on the line to indicate the severity of their pain.

Scoring Conventions. To obtain the patient score, using a metric ruler, measure the distance in centimeters from the left anchor (at base zero) to their mark and multiply by 0.2. This converts the number of centimeters into the appropriate score and yields a score from 0 to 3. For example, the mark is at 8 centimeters – 8 x 0.2 = a pain score of 1.6.

Handling responses:
- If the patient writes in a number on the pain scale, or writes a number in addition to making a mark, take the number, converting it to the corresponding score. In this case, do not measure the mark. For example, if the patient writes "50" on the line, this should be coded as 1.5.

- If a patient records a percentage, multiply the percentage by 3.

- If a patient puts more than one mark, the midpoint is used.

- If a patient makes a horizontal line below the pain scale, instead of a vertical one, the midpoint of that line is taken. If the line starts at the beginning of the scale, measure to the end of the line not the middle.

A 0-100 mm scale may be used, which requires no score computation.

Pain severity coding translations follow below:

PAIN SEVERITY CODING TRANSLATIONS

Measurement (m) = Score	Measurement (m) = Score [contd]
0 = 0	7.8 - 8.2 = 1.6
0.1 - 0 .7 = 0.1	8.3 - 8.7 = 1.7

0.8 - 1.2 = 0.2	8.8 - 9.2 = 1.8
1.3 - 1.7 = 0.3	9.3 - 9.7 = 1.9
1.8 - 2.2 = 0.4	9.8 - 10.2 = 2.0
2.3 - 2.7 = 0.5	10.3 - 10.7 = 2.1
2.8 - 3.2 = 0.6	10.8 - 11.2 = 2.2
3.3 - 3.7 = 0.7	11.3 - 11.7 = 2.3
3.8 - 4.2 = 0 .8	11.8 - 12.2 = 2.4
4.3 - 4.7 = 0 .9	12.3 - 12.7 = 2.5
4.8 - 5.2 = 1.0	12.8 - 13.2 = 2.6
5.3 - 5.7 = 1.1	13.3 - 13.7 = 2.7
5.8 - 6.2 = 1.2	13.8 - 14.2 = 2.8
6.3 - 6.7 = 1.3	14.3 - 14.7 = 2.9
6.8 - 7.2 = 1.4	14.8 - 15.0 = 3.0

Patient Global Scale.

   The Short and Full HAQ both contain the HAQ Patient Global Scale, which is a validated measure of quality of life. Fries and Ramey compared the HAQ Global to the Torrance quality-of-life "feeling thermometer" and found the two scales to be highly correlated (r = -0.676; p<0.001), indicating that both instruments were measuring similar quality of life constructs (Fries and Ramey 1997).

   The HAQ Patient Global Scale is a 15-centimeter, double-anchored horizontal VAS that starts at 0=very well to 100=very poor. It is scored similarly to the Pain Scale.

Key References

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