The QuickDASH Outcome Measure\textsuperscript{1}

A faster way to measure upper-extremity disability and symptoms

Information for Users

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About the QuickDASH

The DASH Outcome Measure has been increasing in popularity since its release in 1996. Today the tool is being used around the world in both clinical and research settings and has proven to be a useful self-report outcome measure for people with musculoskeletal upper-limb disorders.

The QuickDASH is a shortened version of the DASH Outcome Measure. Instead of 30 items, the QuickDASH uses 11 items to measure physical function and symptoms in persons with any or multiple musculoskeletal disorders of the upper limb. Like the DASH, the QuickDASH also has two four-item optional modules that are scored separately.

This shortened version of the tool provides clinicians with an option that enables faster measurement of disability and symptoms; however, there are some advantages to using the full DASH outcome measure. (See Psychometric Properties)

The QuickDASH Outcome Measure is available free of charge (for noncommercial purposes) and may be downloaded from the DASH web site at www.dash.iwh.on.ca. Information on scoring is also available on-line.

Development of the QuickDASH

Statistical analysis of the 30-item DASH indicated that it could be reduced to 11 items while still maintaining an acceptable rating of internal consistency for individual patient evaluation (i.e. Cronbach’s alpha ~ 0.90). Shortening the DASH was felt to be an attractive and sensible option provided that psychometric properties could be maintained.

Three techniques were used for item reduction using field-testing data for the full DASH. Three different scales (i.e. QuickDASH versions) were produced.

Conceptual Method

The first scale was created by selecting items that represented each of the key domains identified in the theoretical framework of the full DASH. The 16 original domains were reduced to 11 based on similarity across domains. Items in the full DASH were sorted according to the domain they represented and were then ranked according to two criteria: first, the importance and difficulty according to patients, and second, correlation with total DASH score. The highest ranking items in each of the 11 specified domains were chosen to comprise the concept-based version of the QuickDASH.

Equidiscriminative Item-Total Correlation (EITC)

The second scale was created by selecting items that had the highest correlation with overall scores across subgroups (those with high, moderate and low levels of disability). The four items with the highest correlation in each grouping were selected to compose
the EITC-based version of the QuickDASH (the item with the smallest correlation of the twelve was eliminated).

**Item Response Theory (Rasch Analysis)**

The third scale was created using Rasch analysis. DASH items were calibrated based on their relative difficulty; misfitting items were eliminated, and an 11-item scale was produced with items theoretically equally spaced and calibrated along the scale length.

**Evaluation and Comparison**

Three distinct QuickDASH versions were produced using the item-reduction techniques described. These scales were evaluated and compared using data from the original 30 item DASH prospective cohort (i.e., 200 individuals with various upper-limb disorders). The final decision of the accepted version of the QuickDASH was made based on the following criteria:

1. number of items with > 40% in one response category
2. Cronbach’s alpha > 0.90
3. highest correlation with the 30- item DASH and with other markers of physical function and severity of problem.

The three versions were similar, though differing in content. The concept version ranked slightly better than the others and was chosen and unanimously supported by the Upper Extremity Collaborative Group (the DASH development group) and named the QuickDASH Outcome Measure.

**Psychometric Properties**

Establishing the psychometric properties of any instrument is an ongoing process and is context specific. In other words, with each new population, clinical setting or treatment type, pilot testing of performance in that particular context is recommended.

Initial testing has shown the QuickDASH to work well in groups of patients (research studies, program evaluation); however, clinicians should be aware that there are advantages to using the full DASH in individual patient monitoring. The precision of measurement is slightly better with the DASH, resulting in greater confidence of the accuracy of scores. Until further data is available on the QuickDASH, clinicians should consider this advantage when choosing which measure to use.

**QuickDASH versus DASH$^2$**

- Reliability

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$^2$ ICC – intra-class correlation coefficient (2,1)
M – average score; $r$ – Pearson product moment correlation
- **Internal Consistency**
  - QuickDASH: Cronbach’s alpha = 0.94
  - DASH: Cronbach’s alpha = 0.97
- **Test-Retest**
  - QuickDASH: ICC = 0.94
  - DASH = 0.96
- **Validity**
  - **Convergent Construct**
    - VAS of overall problem
      - QuickDASH: r = 0.70
      - DASH: r = 0.70
    - VAS of overall pain
      - QuickDASH: r = 0.73
      - DASH: r = 0.72
    - VAS of ability to function
      - QuickDASH: r = 0.80
      - DASH: r = 0.79
    - VAS of ability to work
      - QuickDASH: r = 0.76
      - DASH: r = 0.77
  - **Known-Groups**
    - Able to do all need to versus limited
      - QuickDASH: M = 25.4 vs. 48.6
      - DASH: M = 23.6 vs 47.1
    - Able to work versus unable to work due to upper-limb problem
      - QuickDASH: M = 27.5 vs 52.6
      - DASH: M = 26.8 vs 47.1
- **Responsiveness**
  - Change in group of patients undergoing treatment: expected to improve

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SRM - standardized response mean; VAS - visual analogue scale
All Pearson product moment correlations and known-group differences statistically significant at p<0.05.
QuickDASH: SRM = 0.79
DASH: SRM = 0.78
- Change in those rating their problem as better
  QuickDASH: SRM = 1.03
  DASH: SRM = 1.05

**Scoring the QuickDASH**

The QuickDASH is scored in two components: the disability/symptom section (11 items, scored 1-5) and the optional high-performance sport/music or work modules (4 items, scored 1-5).

**Disability/Symptom Score**

At least 10 of the 11 items must be completed for a score to be calculated. The assigned values for all completed responses are simply summed and averaged, producing a score out of five. This value is then transformed to a score out of 100 by subtracting one and multiplying by 25. This transformation is done to make the score easier to compare to other measures scaled on a 0-100 scale. A higher score indicates greater disability.

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\text{Disability/Symptom Score} = \left(\frac{\text{sum of n responses}}{n} - 1\right) \times 25^3
\]

**Optional Modules (Sport/Music or Work)**

There are two optional modules, each consisting of four items. The optional modules are intended for athletes, performing artists and other groups of workers whose jobs require high levels of physical performance. These individuals may be having difficulties only at these high-performance levels, which are beyond the scope of the 11-item QuickDASH. The same procedure described for the disability/symptom score is followed to calculate the optional four item module score. All four questions must be answered in order to calculate the score. For each module, simply add up the assigned values for each response and divide by four (number of items); subtract one and multiply by 25 to obtain a score out of 100.

**Missing Items**

If more than 10 percent of the items (that is, more than one item) are left blank by the respondent, you will not be able to calculate a QuickDASH disability/symptom score. By this same rule (that is no more than 10 per cent of the items can be left blank), no missing values can be tolerated in the optional modules because each module consists of only four items.

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3 Where \( n \) is equal to the number of completed responses
The Quick DASH Outcome Measure

Instructions

This questionnaire asks about your symptoms as well as your ability to perform certain activities. Please answer every question, based on your condition in the last week, by choosing the appropriate number. If you did not have the opportunity to perform an activity in the past week, please make your best estimate of which response would be the most accurate. It doesn’t matter which hand or arm you use to perform the activity; please answer based on your ability regardless of how you perform the task.

QuickDASH

Please rate your ability to do the following activities in the last week either 1, for no difficulty, 2 for mild difficulty, 3 for moderate difficulty, 4 for severe difficulty, or 5 for unable.

1. Open a tight or new jar
2. Do heavy household chores (e.g., wash walls, floors)
3. Carry a shopping bag or briefcase
4. Wash your back
5. Use a knife to cut food
6. Recreational activities in which you take some force or impact through your arm, shoulder, or hand (e.g., golf, hammering, tennis, etc.).

Choose the appropriate number to reflect the following, with 1 for not at all, 2 for slightly, 3 for moderately, 4 for quite a bit, or 5 for extremely.

7. During the past week, to what extent has your arm, shoulder, or hand problem interfered with your normal social activities with family, friends, neighbors or groups?

Choose the appropriate number to reflect the following, with 1 for not at all, 2 for slightly, 3 for moderately, 4 for quite a bit, or 5 for unable.

8. During the past week, were you limited in your work or other regular activities as a result of your arm, shoulder or hand problem?

Please rate the severity of the following symptoms in the last week by choosing the appropriate number. Choose 1 for none, 2 for mild, 3 for moderate, 4 for severe, and 5 for extreme.

9. Arm, shoulder, or hand pain.
10. Tingling (pins and needles) in your arm, shoulder, or hand.
Choose the appropriate number to reflect your experience for the following, with 1 for no difficulty, 2 for mild difficulty, 3 for moderate difficulty, 4 for severe difficulty, or 5 for so much difficulty that I can’t sleep.

11. During the past week, how much difficulty have you had sleeping because of the pain in your arm, shoulder, or hand?

QuickDASH Disability/Symptom Score = ([sum of n responses/n] – 1) X 25, where n is equal to the number of completed responses.

A QuickDASH score may not be calculated if there is greater than one missing item.

QuickDASH Work Module (Optional)

The following questions ask about the impact of your arm, shoulder, or hand problems on your ability to work (including homemaking if that is your main work role).

Please note what your job/work is. If you do not work, you may skip this section.

Please note the number that best describes your physical ability in the past week. 1 denotes no difficulty, 2 mild difficulty, 3 moderate difficulty, 4 severe difficulty, and 5 unable.

Did you have any difficulty:

1. Using your usual technique for your work?
2. Doing your usual work because of arm, shoulder, or hand pain?
3. Doing your work as well as you would like?
4. Spending your usual amount of time doing your work?

QuickDASH Sports/Performing Arts Module (Optional)

The following questions relate to the impact of your arm, shoulder, or hand problem on playing your musical instrument or sport or both. If you play more than one sport or instrument (or play both), please answer with respect to that activity which is most important to you.

Please note the sport or instrument which is most important to you. If you do not play a sport or instrument, you may skip this section.

Please note the number that best describes your physical ability in the past week. 1 denotes no difficulty, 2 mild difficulty, 3 moderate difficulty, 4 severe difficulty, and 5 unable.

Did you have any difficulty:
1. Using your usual technique for playing your instrument or sport?
2. Playing your musical instrument or sport because of arm, shoulder, or hand pain?
3. Playing your musical instrument or sport as well as you would like?
4. Spending your usual amount of time practicing your instrument or sport?

Scoring the Optional Modules: Add up assigned values for each response; divide by 4 (number of items); subtract 1; multiply by 25.

An optional module may not be calculated if there are any missing items.