

Objectives



Validated metrics are commonly used to evaluate the outcome of any given medical or surgical intervention. The Disabilities of the Arm, Shoulder and Hand (DASH) questionnaire is one such reliable and valid outcome measure^{1,2} and was developed to reflect the impact on the function of upper extremity musculoskeletal disease and injury. Current technology allows for collection of these data electronically rather than hand-written³ and is gaining popularity.

Hypothesis: Scores obtained from administration of a digital version of the DASH survey using a portable touch screen tablet computer will be as accurate as paper DASH scores. Secondary outcomes include completion times, missed question rates, and patient preferences.

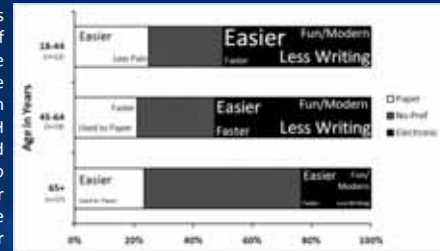
Materials & Methods

We developed an electronic version of the DASH survey (DigiDASH) for use on a touch screen tablet computer. Forty-eight patients (18-87 years) in a hand specialist’s clinic took both the paper DASH and DigiDASH. Correlations were assessed and subject preferences were recorded in open-ended format and qualitatively analyzed. Data quality was compared through assessment of missed question rates and efficiency of administration via differences in time to completion.



Results

There was a significant correlation between DASH scores obtained for each subject via the two modes of administration with no significant difference between the two sets of scores. Neither missed question rates for the electronic (0.6%) and paper questionnaire (0.8%) nor mean times to finish the DigiDASH (4.8 minutes) and paper DASH (3.8 minutes) differed significantly. No correlation was found between age and missed question rates or increased time to complete the DigiDASH. There were no significant order effects found (mean 31.5 on first mode versus 32.5 on the second). Only 11 of 48 subjects (22.9%) preferred the paper version. In the patients who preferred the DigiDASH, most felt it was easier, more fun/modern, and minimized writing.



Qualitative thematic analysis of follow-up responses, including a “word cloud” representation of responses in which font size is proportional to the number of responses selected by each subgroup stratified by age.

Conclusions

The accuracy and completeness of the data collected using the electronic and paper DASH questionnaires were equivalent, and most subjects either preferred the DigiDASH or had no preference. Electronic data collection via this device may become increasingly used for patient outcome studies without sacrificing accuracy or time efficiency and may be particularly useful in subjects with upper limb disability to make data collection less onerous than that obtained via writing.

References: ¹Hudak PL, et al. *Am J Ind Med*, 1996. ²Beaton DE, et al. *J Hand Ther*, 2001. ³Lane SJ, et al. *BMC Med Inform Decis Mak*, 2006.