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ORIGINAL ARTICLE

Validation of the Work-Disability Physical Functional Assessment Battery

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Abstract

Objective: To examine the validity of the self-report Work-Disability Functional Assessment Battery (WD-FAB) physical function scales relative to clinician ratings of function and a performance-based functional capacity evaluation called the Physical Work Performance Evaluation (PWPE).

Design: Cross-sectional.

Setting: Outpatient rehabilitation.

Participants: Adults (N=50) participating in physical therapy for musculoskeletal conditions.

Interventions: Not applicable.

Main Outcome Measures: Patients completed the PWPE and the WD-FAB physical function scales including Changing and Maintaining Body Position, Whole Body Mobility, Upper Body Function, and Upper Extremity Fine Motor. The physical therapist also answered the WD-FAB questions on the patient's physical functioning. The WD-FAB computer-adaptive test version administered up to 10 items for each scale. The PWPE produces ratings from 0 to 5 indicating overall Level of Work ability: 0 (unable to work); 1 (sedentary); 2 (light); 3 (medium); 4 (heavy); 5 (very heavy). The PWPE also produces Level of Work ability ratings in the Dynamic Strength, Position Tolerance, and Mobility subsections.

Results: Participating in the study were 50 patients with 1 or more conditions (shoulder, n=21; knee, n=16; low back, n=13; ankle/foot, n=10; neck, n=8; hip, n=7). The patient-based WD-FAB scores demonstrated moderate, statistically significant correlations with the provider proxy WD-FAB report (R=.49-.65). The WD-FAB Upper Body Function scale scores demonstrated moderate strength relationships with the PWPE overall ratings. The Whole Body Mobility and Changing and Maintaining Body Position scales did not demonstrate statistically significant relationships with the PWPE overall ratings.

Conclusions: We found moderate evidence for validity for the WD-FAB Upper Body Function, Whole Body Mobility, and Changing and Maintaining Body Position scales relative to clinician report and varied evidence relative to the PWPE in this clinical sample.

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The U.S. Social Security Administration's (SSA) disability programs are the largest federal source of assistance, providing funds and access to health insurance for more than 16 million people with disabilities.[1] The magnitude of the program presents challenges to efficiency, as evidenced by long waits for disability case decisions and a substantial proportion of decision reversals of appealed cases. An expert panel convened by the Institute of

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Medicine recommended improving the case decision process by integrating functional information into adjudication decisions.[2] In response to the recommendation, the SSA funded development of the Work Disability Functional Assessment Battery (WD-FAB), a comprehensive self-report measurement system that uses item response theory methods.[3-11]

Item response theory involves developing large calibrated item banks, wherein each item represents a specific position on the hierarchical scale from low to high on the construct of interest. This representation enables estimation of scale scores at the item level. Estimation of scale scores at this level supports the ability to administer different subsets of items on the same underlying metric as well as the use of computer algorithms that tailor item selection to the respondent based on their responses in real time, known as computer-adaptive testing. Instruments based on item response theory have distinct advantages over other instruments, specifically scales that can be changed (e.g., expanded) without altering the underlying metric and the application of measurement properties across different versions of the instrument.

The WD-FAB measures perceived limitation in performance of functional tasks in physical and behavioral domains. The initial instrument, WD-FAB 1.0, which is the subject of this article, was expanded in subsequent work to increase content coverage. The final version, WD-FAB 3.0, comprises 8 scales. The WD-FAB could have a substantial impact on functional assessment in disability evaluation in the SSA process as well as in clinical and vocational rehabilitation settings. As an adjunct to usual medical evidence in the SSA process, WD-FAB could provide valuable information about claimant function as compared to reference values of working-age people of similar age and sex. If this measurement approach is found to provide valid, reliable characterization of function, it could enable SSA adjudicators, clinicians, and vocational rehabilitation providers to negotiate the evaluation process efficiently. Given the importance of the SSA disability determination process, it is critical that WD-FAB undergo rigorous testing to establish sufficient validity and reliability for measurement of function in disability determination and rehabilitation settings. Currently, no criterion standard exists for measuring physical functioning related to work. However, standards have been developed and widely adopted for developing and evaluating evidence for self-report instruments more generally.[12] One approach to examining validity in the absence of a criterion standard is to test hypotheses about relationships between the instrument under investigation and other relevant instruments, a form of construct validation. Under these circumstances, multiple approaches to validation should be conducted, especially in high-stakes applications of measurement instruments.[13] Prior research demonstrated sufficient test-retest reliability, content coverage, and efficiency of the self-report WD-FAB scales in SSA claimant and general population samples.[6,7,11] In addition, initial evidence was found for construct validity relative to legacy self-report measures.[10] Although this initial evidence is promising, it is insufficient for establishing an evidence base for implementation of the WD-FAB on a large scale. In this study, the overall objective was to test the validity of the WD-FAB scales for measuring physical functioning in rehabilitation and disability determination settings, specifically against clinician proxy report and clinical performance tests.

List of abbreviations:

FCE	Functional Capacity Evaluation
PWPE	Physical Work Performance Evaluation
SSA	U.S. Social Security Administration
WD-FAB	Work-Disability Functional Assessment Battery

Performance-based measures involve direct testing of a person's performance in completing a standardized set of physical activities. Performance-based and self-report measures can provide different, complementary information.[14,15] We tested the validity of the Physical Function scales by comparing them to the set of testes known as a functional capacity evaluation (FCE), a performance-based approach used in the field of disability evaluation. The FCE helps trained clinicians evaluate a person's ability to perform work-relevant tasks, specifically by collecting information on the ability to safely perform job tasks, identifying functional deficits for treatment planning, measuring treatment progress, and determining work disability.[16]

Several FCEs are in use in the field of physical rehabilitation, and their measurement properties have been researched.[17-22] The specific FCE chosen for this study, the Physical Work Performance Evaluation (PWPE), provides Level of Work ability ratings (unable to work, sedentary, light, medium, heavy, and very heavy) that are like SSA medical-vocational rules.[20,23,24] The PWPE involves a range of performance tests of varying duration. Including preparation, rest periods, and transition and preparation of materials, it may take 3.5 to 5 hours to complete. The PWPE is a reasonable comparator for testing the validity of the WD-FAB for a couple of reasons: for one, it measures similar constructs using performance based methods, and, for another, it includes activities like those reported in the physical Residual Functional Capacity assessment portion of the SSA disability determination process.

The objective of this study was to examine the validity of the WD-FAB physical function scales relative to provider proxy report on the WD-FAB and the PWPE among patients requiring rehabilitation.

Methods

We conducted a cross-sectional study of volunteers who were participating in therapy for physical injuries or disorders. We hypothesized that WD-FAB scores would demonstrate statistically significant, modest to moderate correlations (0.4-0.5), with PWPE ratings for similar tasks and activities. This hypothesis was informed by published evidence on the relations between self-report measures and clinical performance-based tests in samples with musculoskeletal conditions.[25-28] We estimated that we would need 46 subjects to detect a correlation of 0.40 with power and alpha set at 80% and 0.05.

Instruments and Scoring

Demographics

Consenting subjects provided their demographic information, including race, ethnicity, and education level.

The Work Disability Functional Assessment Battery

We used the items from the WD-FAB v. 1.0 physical function scales, including the following: Changing and Maintaining Body Position (23 items); Whole Body Mobility (16 items); Upper Body Function (22 items); Upper Extremity Fine Motor (28 items); an 8-item Wheelchair Mobility scale.[3,8,11] The WD-FAB scales