Journal of Physiotherapy 67 (2021) 145

Journal of PHYSIOTHERAPY

journal homepage: www.elsevier.com/locate/jphys

Appraisal

Clinimetrics: Assessing functional disability in children and adolescents

Summary

Description: The Functional Disability Inventory (FDI) is a questionnaire designed to assess perceived difficulty in physical and psychosocial functioning of children and adolescents.[1] The FDI is a self-report tool recommended for use with children aged ≥ 8 years and takes < 10 minutes to administer. It is available in 34 languages, and its psychometric properties have been assessed in some translations (eg, Swedish and German).[2,3] The tool was developed for use in children with a variety of conditions.[1] Its psychometric properties have primarily been evaluated in cohorts of children with pain but limited work in other clinical populations (eg, cystic fibrosis and acute minor illness) seems corroborative.[1–8]

Instructions for scoring and interpreting: The FDI is a 15-item scale that assesses perceived difficulty with daily activities at home (eg, doing chores at home), school (eg, being at school all day) and recreational and social domains 'over the last few days'. Participants rate perceived difficulty with each activity on a 5-point Likert scale: 0, no trouble; 1, a little trouble; 2, some trouble; 3, a lot of trouble; and 4, impossible. Items are summed to create a total score (from 0 to 60); higher scores indicate greater disability. A three-level classification system of disability was proposed for paediatric chronic pain populations: no/minimal disability (0 to 12), moderate disability (13 to 29) and severe disability (≥ 30).[4]

Clinimetric properties: In samples of children with chronic abdominal pain, the test-retest reliability of the FDI was high at 2 weeks (r = 0.80), 6 weeks (r = 0.70) and 6 months (r = 0.63).[1] The FDI showed moderate (r = 0.31 to 0.32) cross-informant (parent-child) reliability via concordance with parent-report FDI; however, children's self-rated disability tended to be higher than the parents' rating of their child's disability.[5] Validity of the FDI is acceptable. In youth with chronic abdominal pain, the FDI correlated with pain intensity (r = 0.40), school disability (r = 0.41), somatic symptoms (r = 0.68) and depressive symptoms (r = 0.51) over the following 2 weeks,[5] and school absences (r = 0.44), bed days due to illness (r = 0.46), medication use (r = 0.26) and somatic complaints (r = 0.45) over the following 3 months,[1] supporting the predictive validity of the FDI. Convergent validity was demonstrated in a cohort of children with chronic abdominal pain, through correlations of the FDI with assessments of related constructs, including somatic complaints (r = 0.59), depression (r = 0.52), abdominal pain index (r = 0.33) and pain intensity (r = 0.35).[5] The FDI also correlates with school absences in children aged 9 to 17 years with acute minor illnesses (r = 0.52).[1] Discriminant validity of the FDI was demonstrated in discriminating between children with abdominal pain (recurrent or organic) and without pain ($F[2, 97] = 26.40$, $p < 0.01$).[1] An exploratory factor analysis of the FDI revealed a two-factor solution: physical activities and daily activities. Of these factors, the internal consistency reliability of items was high for physical activities (eight items; Cronbach α = 0.91) and adequate for daily activities (seven items; Cronbach α = 0.77).[4] The FDI also appears to perform well as a unitary measurement, and total FDI score is recommended for use in both clinical and research contexts.[4]

Commentary

Advantages of the FDI include limited clinician burden in terms of cost, training and ease of administration, as well as demonstrated utility across a variety of paediatric pain conditions, including head, back, abdominal and widespread pain.[4,6,7] The Pediatric Initiative on Methods, Measurement, and Pain Assessment in Clinical Trials (PedIMMPACT) guidelines recommend using the FDI to assess physical functioning in clinical trials of school-age children (≥ 8 years) and adolescents with pain.[9] The established three-level classification system (no/minimal disability [0 to 12], moderate disability [13 to 29] and severe disability [≥ 30])[4] for the FDI improves its clinical utility, and is currently being used in clinical trials to stratify care.[10]

Limitations of the FDI are that it fails to take into account the potential differences in activity limitations and social relationships across the developmental spectrum. Future investigations could: expand research beyond those with pain, which would be consistent with its intended use;[1] and establish the minimum clinically important difference of the FDI, which would further enhance its clinical usefulness. Finally, integrating the FDI into digital platforms could provide greater access, increase assessment accuracy, reduce scoring burden and allow for widespread use, including implementation evaluations.

Overall, the FDI is a valid and reliable tool with good clinical and research utility for use by physiotherapists to assess and track changes in functional disability in children and adolescents with pain.

Provenance: Invited. Not peer reviewed.

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https://doi.org/10.1016/j.jphys.2020.07.005