QUESTIONABLE MEASUREMENT PROPERTIES OF THE MOST USED OUTCOME QUESTIONNAIRE FOR CHILDREN WITH ACL INJURY: PEDI-IKDC – A NATIONAL STUDY

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Abstract

Introduction Pedi-IKDC is the pediatric version of the International Knee Documentation Committee subjective outcome score (IKDC). It consists of two subscales, symptoms and sports, but all raw scores are aggregated to one sum score. It is primary outcome in two large scale initiatives for the treatment of children with ACL deficiency: the European ‘Paediatric ACL Monitoring Initiative’ (PAMI), and the North American ‘Pediatric ACL: Understanding Treatment Options’ (PLUTO). However, Pedi-IKDC has not been subjected to validity assessment with optimal methods: modern test theory (MTT) statistical models.

Materials and Methods Data were collected prospectively before surgery and at 1-year follow-up from a nationwide, Danish cohort of 535 children with ACL injury, treated with epiphsyal sparing reconstruction at either Aarhus or Bispebjerg University Hospitals. We evaluated the fit to a confirmatory factor analysis (CFA) model and confirmed results by Rasch analysis for each subscale and for the aggregated score.

Results Neither of the two subscales nor the aggregated score of Pedi-IKDC showed acceptable fit to the CFA model. Rasch analysis confirmed this. It was possible to adjust the subscales, achieving a much better fit to the CFA model for the symptoms scale, but only a slightly better fit for the sports scale. Reliability could not be reported due to inadequate model fit.

Conclusion Pedi-IKDC has inadequate measurement properties for children with ACL-injury. Validity of previously collected data can be improved by modification of the scoring. As Pedi-IKDC also has questionable content validity, data obtained by Pedi-IKDC should be interpreted with great caution.

ACUTE PERIPHERAL FATIGUE INDUCES BRAIN ACTIVITY CHANGES DURING PREDEFINED AND REACTIVE BALANCE TASKS

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ACUTE PERIPHERAL FATIGUE INDUCES BRAIN ACTIVITY CHANGES DURING PREDEFINED AND REACTIVE BALANCE TASKS

Introduction Decreased balance ability may increase injury risk. Also, acute physical fatigue (APF) affects balance performance. Recently, reactive balance tasks were developed to assess balance in a more sport related context. Furthermore, it is unknown if APF induces changes in brain activity during different balance tasks. Therefore, the aim was to study whether (1) APF fatigue alters brain activity during one predefined and one reactive balance task, and (2) performance on these balance tasks.

Materials and Methods Twenty healthy participants volunteered for this cross-over study. APF was induced through a 30-second modified Wingate-protocol. Brain activity was measured through electroencephalography during both balance tasks and computed by means of spectral power analysis. The predefined balance task was the Y-balance test (YBT), while the neurocognitive balance test encompassed the reactive balance test (RBT).

Results Decreased RBT accuracy was observed after APF (p < 0.05), yet YBT performance and RBT visuomotor reaction time remained unaffected. APF induced α- and β-spectral power increments in the prefrontal, motor and posterior parietal cortex during YBT performance (p < 0.05). For the RBT, an α-spectral power increment in the posterior parietal cortex and a β-spectral power increment in the prefrontal cortex were observed due to APF (p < 0.05).

Conclusions APF induces different changes in brain activity during both balance tasks. It is likely that different central mechanisms are affected depending on the type of balance task. Further research is needed in an applied setting to gain insight in the possible interaction between APF and injury occurrence.

INADEQUATE CONTENT VALIDITY OF FOUR FREQUENTLY USED ORTHOPAEDIC QUESTIONNAIRES: A COSMIN EVALUATION OF THE MHHS, HAGOS, IKDC-SKF, KOOS AND KNEES-ACL

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Abstract

Introduction Content validity is the most important property of PROMs. The COSMIN guidelines are often referred to as gold standard to evaluate PROM properties. The aim of this study was by use of the COSMIN checklist to evaluate the content validity of five PROMs, all highly relevant in musculoskeletal research; the modified Harris’ Hip Score (mHHS), the Copenhagen Hip and Groin Outcome Score (HAGOS), the International Knee Documentation Committee Subjective Knee evaluation Form (IKDC-SKF), the Knee injury and Osteoarthritis Outcome Score (KOOS) and the Knee Numeric-Entity Evaluation Score ACL (KNEES-ACL).

Materials and Methods Development articles were identified in PubMed and SCOPUS. A secondary literature search identified studies assessing content validity of the PROMs. Missing information was obtained from the five developers after direct request. To evaluate the quality of the development studies and rate the content validity, the COSMIN Risk of Bias checklist was applied to all relevant studies by two independent researchers.

Results The development of mHHS, IKDC-SKF, and KOOS was rated inadequate, and these PROMs possess insufficient content validity. KOOS was in particular inappropriate to evaluate patients with ACL injury, but it is, despite this, the primary outcome in the Scandinavian ACL-reconstruction registries. The development of HAGOS was rated inadequate, although the insufficiency aspects can be regarded as minor. KNEES-ACL possessed sufficient content validity.

Conclusion Out of five highly relevant orthopaedic PROMs, only KNEES-ACL possessed sufficient content validity.
Abstracts

182 NO CORRELATION BETWEEN PERFORMANCE TESTS, CLINICAL MEASUREMENTS AND PATIENT REPORTED OUTCOME MEASURES (PROM) IN CHILDREN WITH ANTERIOR CRUCIATE LIGAMENT INJURY

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Introduction The outcome following operative or non-operative treatment of ACL injuries in children is traditionally assessed by patient reported outcome measures (PROMs), functional performance tests and clinical measurements (e.g. instrumented laxity). However, there is little evidence as to whether these different types of outcome are complementary to evaluate the condition, or if each outcome is representative for how the child is doing.

Materials and Methods A consecutive group of children (defined as < 16 years old) who had an ACL-reconstruction, were prospectively followed and assessed after 1-year with Pedi-IKDC and KOOS-Child, instrumented laxity measurement, range of motion, extension strength and four performance tests. By partial correlation coefficient analysis, controlling for age, height and weight, correlations between the different outcomes were calculated.

Results In the group of 163 children, 141 had all assessments necessary for the analysis. There were weak to strong correlations between the scores from Pedi-IKDC and the scores from each of the 5 domains of KOOS-Child and a weak to moderate correlation between the different domains of KOOS-Child. Similar correlations were found between the different performance tests. There were only few positive and weak correlations between performance tests and PROMS and between clinical measurements and PROMS.

Conclusion For children who had their ACL reconstructed there was no clinically important correlation between scores obtained by PROMS, a battery of functional performance tests and instrumented laxity of the knee at 1-year follow-up post-operatively. This is an argument for always to include and report all three types of outcomes.

187 DANISH VERSION OF THE WESTERN ONTARIO MENISCAL EVALUATION TOOL (WOMET): A CROSSCULTURAL ADAPTATION, TEST-RETEST RELIABILITY AND RESPONSIVENESS STUDY

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Introduction The Western Ontario Meniscal Evaluation Tool (WOMET) is designed to evaluate Health Related Quality of Life (HRQOL) in patients with meniscal injuries. The purpose of this study was to translate and crossculturally adapt the WOMET for use in Danish and evaluate its reliability and responsiveness.

Materials and Methods The WOMET was forward and backward translated into Danish according to international guidelines. 60 patients (mean age 49 years (range 19–71 years), 57% females) with meniscal injury scheduled for arthroscopy were included in this study. The WOMET was completed at baseline, 3- and 6-months post-surgery. Additionally, test-retest reliability was assessed at 3-months in 55 patients with stable symptom state from test to retest. Responsiveness was assessed between the WOMET and The Knee Injury and Osteoarthritis Outcome Score (KOOS4 – aggregate of 4 of 5 KOOS-subsccales).

Results The Danish version of the WOMET was successfully translated and showed good face validity. Test-retest reliability was excellent, with Intra Class Correlation (ICC) of 0.88 (95%CI 0.84–0.92) for the total score. The Standard Error of Measurement (SEM) was 125 points and the Minimal Detectable Change (MDC) was 347 points (7.8% and 21.7% of the total score, respectively. The WOMET had good responsiveness with an effect size (ES) of 1.12 at 6 months post-surgery, which was comparable to the KOOS4 (ES 1.10).

Conclusion The Danish version of the WOMET is reliable and responsive for assessing health-related quality of life in patients with meniscal pathology.

192 GRAFT FAILURE, REVISION ACLR, AND REOPERATION RATES AFTER ACLR WITH QUADRICEPS TENDON VERSUS HAMSTRING TENDON AUTOGRAFTS

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Introduction It has been indicated that anterior cruciate ligament reconstruction (ACLR) with a quadriceps tendon (QT) graft has a higher risk of revision compared with ACLR performed with a hamstring tendon (HT) graft.

Materials and Methods This was a registry study with review of medical records of patients who underwent primary ACLR with either QT or HT graft performed at Copenhagen University Hospital Hvidovre. The cohort was identified from the Danish Knee Ligament Reconstruction Registry and linked to the Danish National Patient Registry to identify all hospital contacts after ACLR. The outcome variables were graft failure (rupture or >3-mm side-to-side difference in anteroposterior [AP] laxity), revision ACLR, reoperation due to cyclops lesion, reoperation due to meniscal injury, and reoperation due to any reason. AP laxity and pivot shift were assessed at 1 year.

Results A total of 475 patients (252 HT, 223 QT) were included. The rate of graft failure at 2 years was 9.4% for the QT group and 11.1% for the HT group (P=.46). For the QT and HT groups, respectively, the rate of revision ACLR was 2.3% and 1.6% (P=.60), the rate of reoperation due to cyclops lesion was 5.0% and 2.4% (P=.13), and the rate of reoperation due to meniscal injury was 4.3% and 7.1%