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

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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 epiphyseal 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.

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

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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.

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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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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