CONCURRENT VALIDITY AND RELIABILITY OF A NOVEL WIRELESS INERTIAL MEASUREMENT SYSTEM TO ASSESS TRUNK MOVEMENT.

Bauer CM, Rast FM, Ernst MJ, Kool J, Oetiker S, Rissanen SM, Suni JH, Kankaanpää M.
Zurich University of Applied Sciences, Department of Health, Institute of Physiotherapy, Technikumstrasse 71, 8400 Winterthur, Switzerland; University of Tampere, School of Medicine, Kalevantie 4, FI-33014 University of Tampere, Finland. Electronic address: christoph.bauer@zhaw.ch.

ABSTRACT

INTRODUCTION: Assessment of movement dysfunctions commonly comprises trunk range of motion (ROM), movement or control impairment (MCI), repetitive movements (RM), and reposition error (RE). Inertial measurement unit (IMU)-systems could be used to quantify these movement dysfunctions in clinical settings. The aim of this study was to evaluate a novel IMU-system when assessing movement dysfunctions in terms of concurrent validity and reliability.

METHODS: The concurrent validity of the IMU-system was tested against an optoelectronic system with 22 participants. The reliability of 14 movement dysfunction tests were analysed using generalizability theory and coefficient of variation, measuring 24 participants in seven trials on two days.

RESULTS: The IMU-system provided valid estimates of trunk movement in the primary movement direction when compared to the optoelectronic system. Reliability varied across tests and variables. On average, ROM and RM were more reliable, compared to MCI and RE tests.

DISCUSSION: When compared to the optoelectronic system, the IMU-system is valid for estimates of trunk movement in the primary movement direction. Four ROM, two MCI, one RM, and one RE test were identified as reliable and should be studied further for inter-subject comparisons and monitoring changes after an intervention.

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