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Pelvis-trunk sagittal, frontal and transverse inter-segmental coordination and variability in chronic nonspecific low back pain subjects during walking

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Introduction: Inter-segmental coordination and coordination variability, which is an important factor in motor control system assessments during walking, can be affected by different disorders. Nonspecific chronic low back pain (CLBP) is one of the most prevalent musculoskeletal disorders which has been attempted for many years to find its motor control abnormalities in order to be able to prescribe more efficient treatment protocols. The aim of this study was the comparison of the pelvis-trunk coordination and variability, in all motion planes, in the subjects with and without nonspecific CLBP during walking.

Methods: 15 healthy and 15 CLBP volunteers participated in this cross-sectional study. The kinematic data were collected while the subjects were walking at their preferred speed in a 10m walkway. Pelvis and trunk angles were calculated through V3D® software. The inter-segmental coordination and coordination variability were calculated through continuous relative phase method during stance and swing phases of gait.

Results: The trunk-pelvis coordination in the sagittal & frontal plane were statistically more in-phase and less variable during stance and swing phases in CLBP patients. However, the transverse plane revealed no significant difference.

Conclusion: The analysis showed that pelvis-trunk coordination and variability could be affected in the sagittal and frontal planes by CLBP during walking. These results may enhance the body of literature which attempts to quantify the CLBP associated problems in walking. Moreover, the results suggest that the dynamical systems approach based evaluations might be considered valuable to improve the clinical assessment of gait patterns and the effectiveness of rehabilitation programs for CLBP patients.

Biography

Samaneh Ebrahimi has completed his PhD at the age of 31 years from Shiraz University of Medical Sciences, Shiraz, Iran. She is an assistant professor in the Shiraz School of Rehabilitation Sciences. She has published different papers in different journals and has been serving as a reviewer for some journals. Moreover she has been serving as an editorial board member of Journal of Rehabilitation Sciences & Research (JRSR).

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