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Paper Title:	Gait Analysis and Fall Risk Assessment in Patients with Knee Osteoarthritis Using Different Measurement Tools
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Abstract

The gait abnormalities caused by knee osteoarthritis (OA) exhibit variations in walking patterns depending on the severity of the condition. These abnormalities also increase the likelihood of falls. This study aims to analyze gait and assess the fall risk in knee OA patients compared to healthy individuals, using Motion Capture Systems (MCS) and Gait Analysis System (GAS). Five patients with knee OA and five healthy individuals were included in the study. Each participant was evaluated using the Oxford Knee Score (OKS) and the Timed Up and Go (TUG) test, followed by simultaneous gait analysis using the two tools. The results demonstrate significant differences between the two groups in terms of speed and stride length, as measured by MCS ($p=0.026$, and $p=0.049$, respectively) and by GAS ($p=0.043$, and $p=0.029$, respectively). Knee OA patients walked slower and had shorter stride lengths compared to the healthy group, leading to a higher fall risk among the OA group. Additionally, the gait measurements obtained from the two tools showed a significantly high correlation within the OA group, with speed ($r=0.994$, $p<0.001$), stride length ($r=0.910$, $p<0.05$), and left step length ($r=0.975$, $p<0.001$). The result of this study contributes to the screening and preliminary health assessments, leading to the design of treatment, physical therapy, and fall risk monitoring.