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The effect of focus of attention on movement efficiency during level-ground walking by older fallers: Implication for fall rehabilitation

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Previous studies have shown that an external focus of attention results in higher movement efficiency with better motor performance than an internal focus. The present study examined whether instructions inducing an external versus internal focus of attention would differentially affect movement efficiency during level-ground walking in older fallers. Thirty-five community-dwelling older fallers (mean age=70.7 years, SD=5.0 years) were recruited from different elderly community centres in Hong Kong. The whole experimental procedures included baseline assessments and walking trials. During the walking trials, each participant was requested to walk at comfortable pace along a 6-meter walkway for a total of nine trials under three different attentional conditions: Internal, External and Control. Surface Electromyography (EMG) was used to record muscle activities of 4 major lower limb muscle groups (i.e., Rectus Femoris, Biceps Femoris, Tibialis Anterior and Medial Gastrocnemius). Thigh and shank muscle co-contractions were evaluated using the co-contraction index (CI). Results showed significantly greater increase of shank muscle co-contraction (expressed in percentage change from Control condition) in Internal condition (+4.9%) relative

to External condition (+0.2%). However, thigh muscle co-contraction did not significantly differ between External and Internal condition. The findings suggest that internal focus of attention can potentially reduce movement efficiency by elevating co-contraction of ankle stabilizer muscles in older fallers during locomotion. The present study reinforces the need for clinicians to consider the potential negative impact of utilizing instructions that explicitly refer to body movements (internal focus) during gait rehabilitation to reduce fall risk in older fallers.

Biography

Toby Chi-To Mak has completed his BSc in Exercise and Health and is currently pursuing his PhD candidate in the School of Public Health, Li Ka Shing Faculty of Medicine at the University of Hong Kong. His primary research interests include motor control and learning, psychomotor aspects of ageing and fall rehabilitation. His research studies focus on the impact of attention on gait behavior in older adults with the risk of falling. He is also interested in gaze behaviour and its effect on gait performance in older adults with the risk of falling.

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