UNIVERSITI TEKNOLOGI MARA

EFFECTS OF DUAL-TASKING ON GAIT PERFORMANCE AND POSTURAL SWAY IN STROKE SURVIVORS WITH DIABETIC PERIPHERAL NEUROPATHY

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AUTHOR'S DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the results of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations for Post Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

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ABSTRACT

This study investigated the effects of dual-task conditions on gait, turning and postural balance performance among stroke survivors with and without diabetic peripheral neuropathy (DPN). Stroke survivors depend on the unaffected leg during walking and standing. The presence of diabetic peripheral neuropathy (DPN) which affected both legs may affect gait performance and postural balance during dual tasking conditions. Forty stroke survivors were recruited for this study, with twenty were diagnosed with DPN (M=57.15 years old, SD= 7.17), and twenty without DPN (M= 54.75 years old, SD 7.95). Timed Up and Go (TUG) test and postural sway test was conducted. APDM Mobility Lab system (Mobility Lab; APDM Inc., Portland, OR, USA) was used to capture the gait and turning parameters and postural sway in three different tasking conditions (single task, dual-motor tasks, and dual-cognitive tasks). Two-way mixed analysis of Variances (ANOVA) was used with one between-subject factor (stroke survivors with DPN vs stroke survivors without DPN) and one within-subject factor (the three tasking conditions; single task, dual-motor tasks and dual-cognitive tasks) to analyse the data. The results showed that stroke survivors with DPN were more affected by the dual tasking, either dual motor or dual cognitive, than the stroke survivors without DPN in several area. First, the TUG time, step length, stride length, stride velocity, and double support time of the stroke survivors were more affected by the tasking condition as compared to stroke survivors without DPN. Second, during turning, stroke survivors with DPN were more affected by the tasking conditions by having longer turning time and turning step times as compared to stroke survivors without DPN. Third, the postural performance of the stroke survivors with DPN also were more affected by the tasking conditions, by having increased postural sway velocity and postural sway area in comparison with stroke survivors without DPN. For the last objective, analysis of covariance (ANCOVA) were done, with the MoCA and BBS score as covariates, and there were still significant differences in walking, turning and postural performance between stroke survivors with and without DPN. In summary, stroke survivors with DPN were more affected by dual tasking in gait, turning, and postural balance performance in comparison with stroke survivors without DPN.

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