

Analysis of how Dual-tasking Effects Selected Gait Variables in Older Adults with a Known Relative Power

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Muscular power is a strong indicator of physical performance within an aging population. In addition, as one ages there is a greater need for attentional demands while walking. Thus, changes in gait patterns have been noted when performing a cognitive task or dual-tasking (DT). **PURPOSE:** The aim of this study was to kinematically compare differences in power groups on selected gait parameters while DT. **METHODS:** Twenty-three older adults ($M \pm SD$ = age: 71.1 \pm 4.4 yrs; height 1.71 \pm 0.09 m; mass 84.6 \pm 17.2 kg) volunteered to complete five sit-to-stand tasks (STST) and four walking trials (20 m). Subjects were placed into a low (LPG) or high power (HPG) group based on their relative power (P_R). The walking trials were randomized and counter-balanced: habitual (HAB) and habitual with a cognitive task (DT). P_R was calculated from peak power as measured by a Tendo weight lifting analyzer during the STST. Selected gait variables were measured using a gait mat placed in the middle of the walkway. Data were analyzed using a 2x2 repeated measures ANOVA. **RESULTS:** There was significant difference for gait speed ($p = .02$). The HPG walked faster than LPG during the HAB trial. There was not a difference between the groups during the DT. There were statistically significant differences across the gait variables measured between HAB and DT regardless of grouping ($p < .05$). There was no difference in double support time (DST); however, there was a trend for the LPG to increase DST during the DT ($p = .078$) and decrease step length more than the HPG ($p = .08$).

Power and Gait Variables ($M \pm SD$)

	High Power (n = 11)		Low Power (n = 12)	
Relative Power (W/kg)	9.75 \pm 1.68		6.53 \pm 1.28	
Variables	HAB	DT	HAB	DT
Gait Speed (m/s)	1.35 \pm 0.18* [^]	1.00 \pm 0.23	1.17 \pm 0.19*	0.99 \pm 0.26
Step Frequency (steps/min)	111.83 \pm 10.08 [^]	102.82 \pm 15.44 [^]	109.00 \pm 5.92 [^]	96.92 \pm 19.58 [^]
Double Support Time (s)	0.29 \pm 0.09 [^]	0.34 \pm 0.09 [^]	0.29 \pm 0.10 [^]	0.42 \pm 0.13 [^]
Step Length (m)	0.72 \pm 0.11 [^]	0.68 \pm 0.10 [^]	0.65 \pm 0.08 [^]	0.6 \pm 0.12 [^]

Note: * Significant Difference between Groups ^ Significant Difference between Conditions ($p < .05$)

CONCLUSION: This study showed DT does influence selected gait parameters in older adults. In addition, power did not have a profound effect on the gait variables even though there was a significant difference in P_R between the groups.