

Effects of a four-month judo training on gait performance in old male and female practitioners

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The fall-related injuries are a crucial health, social, and economic problem in older populations and there is a need of effective programmes to prevent falling¹. To quantify locomotion changes with aging and to monitor the effects of therapeutic interventions, gait variability is a sensitive and clinically relevant parameter². The aim of this study was to investigate the effects of a 4-month judo training (1-hr training session, twice a week) on gait performance in older individuals (age: 60-76 yrs). The experimental group (JG) included 16 (F=8, M=8; 69.3±3.9 yrs) participants to a 4-month judo programme, whereas the control group (CG) encompassed 14 (F=5, M=9; CG: 70.1±4.5 yrs) moderately active controls (CG). Average values (AVG) and coefficients of variation (CV) of step length during habitual (HWS) and maximal walking speed (MWS) were computed in a flat path (flat), walking on a narrow (20 cm wide) corridor (corridor), and walking on a path with hurdles (hurdles). A 2 (gender) x 2 (group) x 2 (time) ANOVA for repeated measures was applied to ascertain differences between groups in the different conditions ($p < 0.05$). A main effect emerged for time ($p = 0.042$), whilst significant interactions time x group ($p = 0.004$) and time x group x gender ($p = 0.019$) were revealed. Post hoc analysis (adjusted p for 12 comparisons = 0.0041) did not confirm the differences for the time effect. Regarding the time x group interaction, significant reductions were confirmed in JG for CV in the HWSflat (pre: 4.79±2.08%, post: 3.74±1.27%, $p = 0.03$), MWSflat (pre: 4.71±1.34%, post: 3.89±1.22%, $p = 0.013$), and HWSHurdles (pre: 11.26±2.58%, post: 9.62±1.62%, $p = 0.012$). In CG significant increases were confirmed for CV in the MWSflat (pre: 3.47±0.94%, post: 4.67±2.21%, $p = 0.039$) and MWScorridor (pre: 4.85±1.54%, post: 6.24±2.16%, $p = 0.007$). Regarding the interaction time x group x gender, significant differences emerged for CV in HWSHurdles ($p = 0.003$). Post hoc analysis maintained significant differences for the female JG (pre: 11.81±3.42%, post: 8.92±1.47%, $p = 0.017$). These findings indicate a positive effect of judo training on gait performance in novice senior judo population, particularly in women.

References

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- [2] Hausdorff, J. M. Gait variability: methods, modeling and meaning. *J Neuroeng Rehabil* 2, 19. (2005).

Key words

Gait analysis, gait variability, older persons, judoka, physical activity.