P40. Analysis of the human walking gait with and without external weight added on lower limbs of physically active individuals

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INTRODUCTION

Human walking is one of the most studied tasks in biomechanics and in other sport sciences fields (Alexander, 1984; Branco, Santos-Rocha, Vieira, Aguiar, & Veloso, 2016; Stolze et al., 1997; Tao, Liu, Zheng, & Feng, 2012). Nevertheless, walking continues to be widely used as a form of exercise (Siegel, Brackbill, & Heath, 1995) or physical activity (Eyler, Brownson, Bacak, & Housemann, 2003). However, it is common to see practitioners using ankle weights or other types of weights attached to the lower limbs. The aim of the present study is to verify if there are any changes in gait when weights are used in lower limbs, in young and active adults. Methods: Three cycles of three subjects were included for analysis. For the collection, markers were attached in lower limbs and SkillSpector was used for kinematic analysis. Excel and IBM SPSS Statistics softwares were used for data treatment.

RESULTS

The variables in analysis are in Table 1. The Stance Phase time with weights (WN) has 4% higher duration than without weights (WW). The stride length was 0.19m higher when performed without external weight. The peak of velocity was 0.3m/s higher when performed without weight. The range of motion of the ankle, knee and hip joints, were 6.62º, 6.21º and 4.77º, respectively greater when performed without load.

Table 1
Spatial, temporal and angular variables in analysis (mean ± standard-deviation).

	Without external Weight	With External Weight
Stride time (s)	1,08 ± 0,07	1,37 ± 0,01
Stance Phase time (%)	0,61 ± 0,04	0,65 ± 0,03
Swing Phase time (%)	0,39 ± 0,04	0,35 ± 0,03
Max Velocity peak (m/s)	1,52 ± 0,10	1,22 ± 0,12
Stride Length (m)	1,17 ± 0,10	0,99 ± 0,12
Ankle ROM (deg)	29,44 ± 6,14	22,82 ± 3,76
Knee ROM (deg)	55,25 ± 1,35	49,04 ± 6,59
Hip ROM (deg)	32,50 ± 2,22	27,73 ± 2,67

Beside the absolute values differences, statistical analysis doesn't reveal any significant changes between both conditions of external weight added to lower limbs

CONCLUSIONS

The addition external weight to the lower limbs seems to induce some changes of kinematic variables, however, in this study, statistical differences between the conditions in analysis were not found. We recommend the increasing of the sample to ensure these results.

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