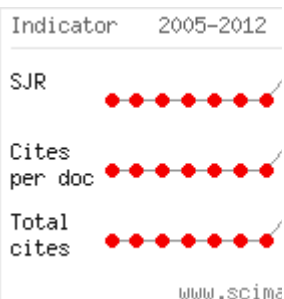


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## Standing long jump and handheld halters; is jumping performance improved?

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### Abstract

The purpose of this experimental study was to document the kinematic and dynamic characteristics of the standing long jump without extra loading and with handheld weights (halters) of different mass and to investigate any association between the former and jumpers' performance. Fifteen subjects (13 males and 2 females) between the ages of 19 and 21 years old participated in this horizontal prospective study. Each participant

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performed standing long jumps. Regarding the jumping technique, free arm swinging without or with handheld halters of different weights (1.5 kg and 3 kg in each hand) was used. The subjects repeated the jumping set (consisted of free arm swinging jump, jumping with 3 kg and then with 6 kg handheld halters) three times and the three different technique jumps were performed in a random order. The jumping distance was significantly increased 7 cm (2.7%) with 3 kg handheld halters compared to free arm jumps ( $p=0.006$ ). In addition the subjects jumped 5 cm further with 6 kg handheld weights ( $2.67 \pm 0.27$  m) than without ( $2.62 \pm 0.21$  m) (statistically significant difference,  $p=0.005$ ). The horizontal displacement of the center of mass was significantly increased with 3 kg and 6 kg handheld compared to free arm jumps ( $p=0.007$ ,  $p=0.005$  respectively). Take off angle of center of mass difference was statistically significant between 0 kg ( $36 \pm 5^\circ$ ) and 6 kg ( $29 \pm 5^\circ$ ) handheld weights (12.13% decrease,  $p=0.001$ ). A gradual significant increase in the horizontal take off velocity of the center of mass was depicted between free arm and 3 kg halters jump (3.5% increase) and 3 kg weights and 6 kg ones (3.69% increase). In conclusion greater distance is achievable during a loaded standing long jump due to 1) horizontal translation of the center of mass, 2) the greater ground reaction force that is generated, 3) decrease in take off angle of center of mass and 4) increase in the horizontal take off velocity of the center of mass.

Key words: STANDING LONG JUMP; HALTERS; JUMPING DISTANCE

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