

Effects of Frequency on Landing Motion in Jump Rope: a Ground Reaction

Force Aspect

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Abstract

Jump rope is one of the supplemental training activities for many sports. Many teachers and coaches instruct their students to jump rope without noticing the possible effects of frequency on the landing motion and the effectiveness of jump rope. This study was conducted to measure the vertical ground reaction force, passive impulse, impulse, and loading rate of the subjects in jump rope. Three frequencies were tested: 60(± 2), 100(± 2), and 140(± 2) beats per minute. The kinematic parameters were collected using a force platform. A motion tracking system was used to capture the motion of the jumpers. It was found that the vertical ground reaction force and passive impulse for the high frequency condition was significantly higher than those of the medium and low frequency conditions. The impulse and loading rate were also significantly ($p < 0.05$) affected by jumping frequency.

Keyword : passive impulse, ground reaction force, force platform, jump rope