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Introduction

Today, knowledge is lacking on how great the forces acting on slopestyle athletes are. Therefore the scale of impact and training load are difficult to estimate. With better knowledge of the impact forces on the slopestyle athlete, strategic training programs could be improved to optimize the athlete's physical ability prior to the snow season. This could also help to build the physical profile of the sport, which in turn can determine if an athlete should compete at a certain level.

Objectives

The purpose of this study was to investigate the magnitude of force a slopestyle skier is exposed to when landing either forward or switch in a big air jump.

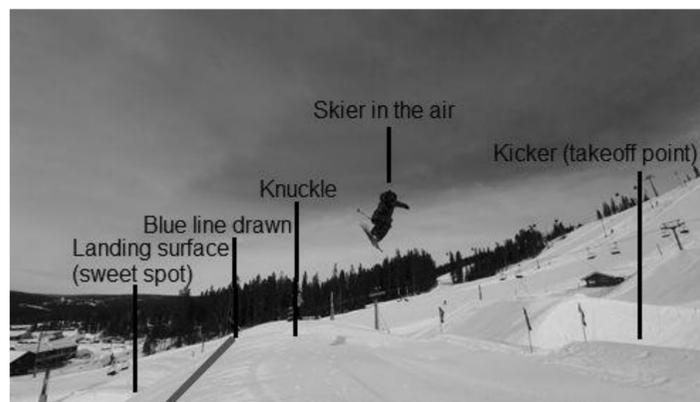


Fig. 1. A "180 jump" is being executed in a big air jump in Kläppen Snow Park.

Materials & Methods

Ten male freeskiers (age 23 ± 6 years; height 179.2 ± 5.4 cm; body mass 72.5 ± 8.6 kg; mass of equipment 16.7 ± 1.4 kg; total mass 89.2 ± 8.6 kg) participated and each performed five 180 jumps and five switch 180 jumps in a randomized order. These jumps were executed in the most advanced big air jump in a snow park. Forces were quantified using pressure insoles.

Results

The results showed a force of 1446 ± 367 N (2.04 ± 0.46 times body mass) for the 180 jump and a force of 1409 ± 257 N (1.99 ± 0.28 times body mass) for the switch 180 jump. There was no difference in force between the 180 jump and the switch 180 jump, $p=0.582$.

There was a trend for the switch 180 jump for a correlation between a heavier body mass and a greater force ($r = 0.604$, $r^2 = 0.365$, $p = 0.064$) as well as a heavier total mass and a greater force ($r = 0.621$, $r^2 = 0.385$, $p = 0.055$).

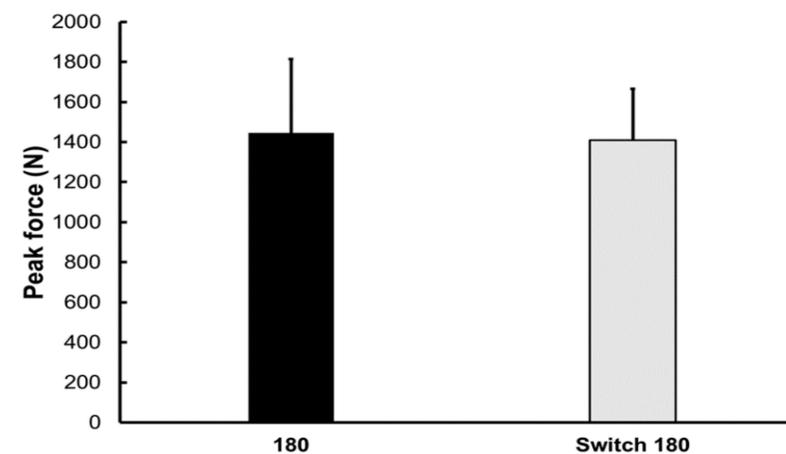


Fig. 2. 180 jump with switch landing. Switch 180 jump with forward landing.

Conclusions & Practical Applications

- The force when landing a big air jump is roughly twice the slopestyle skier's body mass, but no difference in force was seen between performing a 180 or a switch 180 jump.
- The force of twice the body mass could be considered a minimum value for slopestyle skiing.
- If an athlete performs a more difficult trick, the requirements for the strength training may want to be higher.
- These findings can help to create training programs for the dry land training that will facilitate the handling of similar forces during the on-snow season.