

Background

Athletes are constantly maneuvering on the playing field, planting, cutting, and jumping at an unpredictable rate. Valgus forces are experienced through internal rotation of the hip, adduction of the tibiofemoral joint (knee) and over pronation of the subtalar joint (ankle).

Females are more inclined to produce valgus knee pressure when performing certain athletic movements because they naturally have more internally rotated hips than males.

Purpose

The purpose of this study is to determine whether the angle of valgus force has an increased effect on ACL injuries in athletes and non-athletes. Some demographic variables that increase risk of ACL injury are age, gender, and mobility.

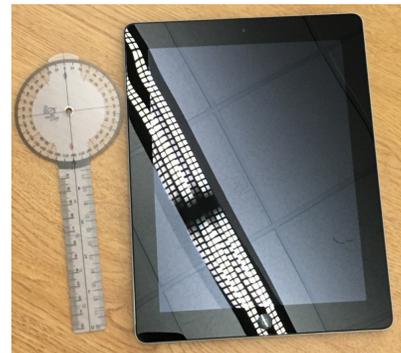


Methods

We had 34 participants with a blend of athletes (6), non athletes (11), males (11), and females (6). An iPad video was taken of a subject jumping off of a twenty inch box. The video was then viewed in slow motion to determine the maximum impact point.

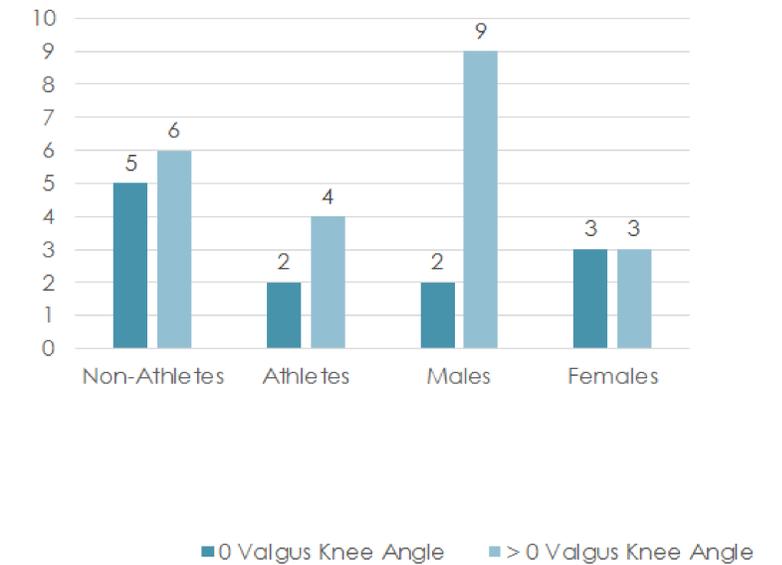
Upon the finding of the maximum impact point, a line was drawn from the knee straight down to the ground, and another line from the knee to the lateral malleolus.

The valgus knee angle was then measured with a protractor and the data was recorded.



Results

- 41% of the subjects had a valgus knee angle of zero when landing.
- 59% of the subjects had some form of valgus knee angles when landing.
- 33% of athletes tested had a valgus knee angle of zero.
- 45% of non-athletes tested had a valgus knee angle of zero.
- 50% of females tested had a valgus knee angle of zero.
- 18% of males tested had a valgus knee angle of zero.



Discussion

These results could be used to develop workout regimens to correct structural knee imbalances within the population.

This experiment can give a better understanding on how these injuries occur and how they can be prevented.

The results did not support our hypothesis because the male participants appeared to have worse valgus knee angles than the female participants.

