

## Abstract

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### The Effect of Six Sessions of Barefoot Running on the Flexibility of the Foot and Ankle Complex in Respect to the Risk Factors of Plantar Fasciitis

**Purpose:** To determine if barefoot running could cause changes in the foot and ankle complex that could reduce the risk factors commonly associated with plantar fasciitis.

**Methods:** Five female and four male participants had their range of motion (ROM) assessed for ankle dorsiflexion, ankle plantar flexion, forefoot inversion, forefoot eversion, and great toe extension with a neutral ankle (Baseline<sup>TM</sup> and Baseline 12-1001, IGAGING 10" Digital Protractor/Goniometer). In addition to these ROM measures, participants had the length of their medial arch and navicular foot drop measured (Caliber 2009). Each of the measures was taken three times for each foot and average of these was taken. After six sessions of the protocol, all measurements were re-assessed. For the first testing session each participant ran one mile at six miles per hour. For each session thereafter, participants had a choice to run within the range of one mile at six miles an hour to three miles at six miles an hour on 1% incline. Participants reported to the lab three times a week for the duration of six testing sessions.

**Results:** The study included 9 participants (5 females and 4 males) who were 18 - 22 years of age. All enrolled participants completed the study. There was a notable, though non-significant ( $p > 0.05$ ) decrease in the ROM for ankle dorsiflexion in both feet. There was a non-significant increase ( $p > 0.05$ ) in the ROM for plantar flexion in both feet. There was a significant increase in the range of motion in the left and right foot ( $p < 0.01$ ) for forefoot eversion. There was a significant increase in ROM for forefoot inversion

in the left foot ( $p < 0.01$ ) while an increase, though not significant, was found in the right foot ( $p > 0.05$ ). There was a significant increase in ROM for great toe extension in the left foot ( $p < 0.05$ ) while a decrease, although not significant, was found in the right foot ( $p > 0.05$ ). There was no significance found in navicular foot drop ( $p > 0.05$ ), which increased pre to post in the left foot and decreased pre to post in the right foot. There was a significant decrease in medial longitudinal arch length in the right foot ( $p < 0.05$ ) while a decrease, although not significant ( $p > 0.05$ ) was found in the left foot.

**Discussion:** Favorable changes were found in the measures of plantar flexion, forefoot eversion, inversion, and medial longitudinal arch length. The measures of ankle dorsiflexion, great toe extension, and navicular foot drop were in contrast to the hypothesis but are likely due to the short duration of the study which likely caused the participants to be experiencing soreness and a lack of complete muscular developments at the time of measurement reassessment. Previous literature has found that a period of two to three months is necessary for complete muscular development (Robbins).