Title: EFFECT OF TREADMILL VERSUS ELLIPTICAL EXERCISE ON CALCANEAL STIFFNESS INDEX AMONG COLLEGE AGE FEMALES

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Introduction: Osteoporosis is a disease that affects many older individuals, resulting in a decrease in bone density. Involvement in impact loading sports has been associated with greater stiffness index (SI) of the calcaneus when compared to nonimpact sports and abstinence from sports (1). However, comparisons between the effectiveness of impact and nonimpact exercise equipment on calcaneal SI is less clear. The purpose of this study was to examine the effect of treadmill versus elliptical exercise on calcaneal SI.

Methods:

- Participants Nine college-age females were recruited for this cross-sectional design study. The independent variables were the treadmill training group and the elliptical training group, and the dependent variable was the change in stiffness index (SI) of the calcaneus.
- Protocol Calcaneal SI was tested at the beginning and end of a 10-week training session. The Calcium Rapid Assessment Method was also used to assess dietary calcium intake among participants.

Statistical Analysis – Pearson product correlation analysis was used to determine
whether significant (p < .05) relationship between study variables existed. Paired
sample t – tests were conducted to determine whether group differences were
significant.

Results: Pearson product correlation analysis did not indicate a significant relationship between dietary calcium intake and calcaneal SI and therefore calcium was eliminated as a covariate in subsequent analyses. Paired sample t-test for the entire sample indicated significant improvements in calcaneal SI over the 10-week training period (t = -3.01, p = .02). However, when the sample was split by exercise group, the paired sample t-tests were not significant (p > .025). An independent sample t-test using change in calcaneal SI as the dependant variable was also not significant (p > .05). **Discussion:** In conclusion both treadmill and elliptical training resulted in increases in calcaneal SI over a 10-week period but we were unable to detect significantly more benefit from treadmill training, which was counter to our hypothesis. According to this study, both types of exercise are beneficial to bone health.

1. Yung P, Lai Y, Tsul H, Wong C, Hung V, Quin L. Effects of weight bearing and non-weight bearing exercises on bone properties using calcaneal quantitative ultrasound. Br J Sports Med 39: 547-551, 2005.