

The Acute Effect of Exposure to Barefoot Running on VO₂peak, Fatigue, and Time to Exhaustion in Recreational Runners

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The concept of Bare Foot (BF) is based on a naturalistic approach to promote running efficiency through forefoot striking patterns. In Contrast, Lieberman et al, 2010 showed that traditional running shoes with high cushioned heels facilitate a rear foot striking pattern. This pattern of running has been found to be relatively inefficient. Hasegawa et al, 2007, showed that 75% of half marathon runners were rear foot strikers which correlated with slower running speeds, in contrast those athletes who demonstrated mid or forefoot striking patterns were more efficient with faster running speeds. This suggests that a forefoot or mid foot striking pattern may increase performance. To date, the majority of studies investigating the effects BF running have used trained runners with multiple exposures before data collection. This limits the generalizability of the data and may not depict the physiological changes that occur with acute exposure. **Purpose:** The purpose of this study was to investigate the physiologic response during the acute exposure to BF running. **Methods:** The subjects consisted of 12 recreational runners with no previous history of BF running. The subjects reported to the lab on two separate occasions for either the shod running trial in which they wore running shoes or the BF trial in which a pair of athletic socks was worn. The protocol for both sessions consisted of a brief warm-up followed by the Astrand Treadmill protocol. VO₂peak, local RPE (lower extremity), systemic RPE, and time to exhaustion were collected and analyzed. **Results:** The results of this study found no statistically significant differences ($p > 0.05$) for time to exhaustion 821.75 ± 104.7 and 793.0 ± 131.98 seconds, VO₂peak 52.05 ± 4.69 and 52.38 ± 7.46 ml/kg/min, local RPE 17.25 ± 2.01 and 17.75 ± 1.86 , and systemic RPE 17.17 ± 1.59 and 17.42 ± 1.00 for shod and BF running respectively. The researchers found that each subject did transition within 60 seconds from rear foot strikers to mid/ fore foot strikers. **Conclusion:** The findings of this study suggest that there is no difference in physiologic or fatigue values between shod and barefoot running during an acute exposure, however transition of running style did occur. This would suggest that novice runners with no BF experience might in fact benefit just as experienced runners do from BF running.