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## A Comparison of Self-Reported Pain Levels in Minimally-Shod vs Traditionally Shod Runners with Different Arch Characteristics

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Minimalist running has recently become popular with the intention of lowering overuse injury rates seen in distance running. The efficacy of wearing minimalist shoes to prevent injury has been greatly debated. We previously reported that arch height (pes cavus, normal, pes planus) affects lower extremity pain in minimalist runners; however, no clear relationship has been established between either arch height index (AHI) or arch rigidity index (ARI) and running shoe type, and pain. The **PURPOSE** of this study was to examine self-reported pain in the lower limbs in minimally and traditionally shod runners with various AHIs and ARIs. **METHODS:** Following consent, 60 experienced runners (age  $26.88 \pm 9.2$  yrs, hgt  $171.6 \pm 9.8$  cm, mass  $68.7 \pm 15.1$  kg, gender: 40F/20M) completed a visual analog scale (VAS) about pain in five common sites of injury: knee, ankle, calf, shin, and foot (VAS  $\geq 3/10$  was considered pain). AHI was categorized as high (n=30), normal (n=60), and low (n=30). ARI was categorized as rigid (n=30), normal (n=60), and flexible (n=30). A series of 3-factor chi-square analyses determined if shoe type (minimalist, traditional) and AHI (high, normal, and low arch) were related to overall and site specific pain (yes, no). ( $\alpha=0.05$ ). Additional 3-factor chi-square analyses determined if ARI (rigid, normal, and flexible) and shoe type (minimalist, traditional) were related to pain (yes, no). ( $\alpha=0.05$ ). **RESULTS:** More minimalist runners with a normal AHI (70.0%;  $p=0.028$ ) reported pain in at least one site when compared to traditional runners with a normal AHI (40.0%;  $p=0.028$ ). All minimalist runners with a rigid arch reported pain in at least one site (100%,  $p=0.003$ ) while reported pain in traditional runners was less common (28%;  $p=0.003$ ). However, the interaction between site specific pain, arch characteristics, and shoe type is not as clear as the results varied between the different AHI/ARI, shoe type, and site specific pain combinations. **CONCLUSIONS:** Generalizations about site specific pain in minimally or traditionally shod runners with high/low or flexible/rigid arches are difficult because the results are combination specific. Runners with a rigid arch may not be able to absorb ground reaction forces as well when wearing minimal shoes and may fare better in a traditional shoe that offers more support during ground contact.