

Do Arch Height and Arch Stiffness Relate to Physical Performance in Adult Men?, Zhao, et al., *Journal of Foot & Ankle Surgery*, Volume 61, Issue 2, March 1, 2022

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Level of Evidence: 4

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The goal of this study was to further understand the associations between arch structure and function with physical performance. Comparative studies have been conducted, looking into various topics such as excessive arch heights causing injuries or musculoskeletal disorders, arch flexibilities, and arch parameters in overweight and obese people. However, there has been no evidence found correlating arch structure and function to an individual's physical performance. This research was performed to fill the educational gap.

56 men with an average age of 49 years old participated in this study. Each participant reported having no regular exercise regimen and no previous foot or ankle disorders that could influence the results of this study. Only participants' right foot data was measured to maintain congruity with foot arch research performed in the past. The two main foot measurements used in this study was the **arch height index (AHI) and arch stiffness index (ASI)**. AHI is defined as the "instep height divided by the ball of the foot length," while ASI is defined as the "ratio of the standing position of AHI divided by the sitting position of AHI."

To measure physical performance, each participant carried out a series of movements. These movements included stepping side to side, stepping forward and backward, vertical jumping, and balancing on one leg with their eyes closed. These movements were chosen due to their good reliability and validity after being used in previous studies. These movements were used to evaluate the participants' agility, force, and proprioception. Once the data was run, significant correlations were found between AHI and stepping forward/backward and the vertical jump. No correlational relationships were found between ASI and the various movements, regardless of age and BMI being controlled for. Multivariate linear regression analysis indicated AHI, age, and BMI could efficiently predict an individual's vertical jump height. This study also suggested there is a negative correlation between a person's arch height and his lower extremity muscle power.

While this study answers many questions not previously explored, the researchers acknowledge that this study had many limitations, the biggest being the research may not be applicable to other populations such as women, children, or physically active men. This study also did not investigate other factors that could have swayed the results, such as lower extremity muscle strength. These topics should be studied in future projects.



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