The relationship between Body Mass Index (BMI) and Gender on Static Foot Posture in physiotherapy undergraduates at Kotelawala Defence University, Sri Lanka - A cross-sectional study

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Introduction: Foot biomechanics play a significant role in the quality of standing and ambulation. As the deviations of Body Mass Index (BMI) from normal range has a significant effect on different types of foot posture and foot’s loading characteristics that can lead for alterations of foot structure which may cause long term debilitating effects that impair quality of life. The aim of this study was to determine the association between BMI and gender on static foot posture among the physiotherapy undergraduates at Kotelawala Defense University, Sri Lanka.

Method: All the physiotherapy undergraduates of the university during the study period of 2021 participated in this cross-sectional study and nonprobability sampling was used. A Stadiometer with digital weight scale was used to measure BMI. Static foot posture was evaluated by Arch Index (AI) and Foot Posture Index (FPI). Results: There were 96 female and 29 male participants. The mean (SD) age and BMI of both female and male participants were 23(SD±2) years, 21.71(±3.68) and 24.16 (±3.57). A significant positive correlation between Body Mass Index, Arch Index and Foot Posture Index was obtained; In AI left & right foot (p=0.012), (p=0.041) and FPI in left foot (p=0.025) were obtained. A significant difference was not observed between static foot posture (in the Arch Index and the Foot Posture Index) and gender in bilateral feet (AI in left and right foot (t= 0.581, p= 0.562) , (t=0.621, p=0.536) , FPI in left and right foot (t=0.357, p=0.721), (t=-0.183, p=0.855)). Highly pronated (left and right) foot and low arch foot were observed more among female participants (FPI, left (M=3.2%, F=7.2%) and right ((M=1.6%, F=5.6%)), AI, left foot (M=8.8%, F=31.2%) and right foot (M=9.6%, F=27.2%)).

Conclusion: The results of our study revealed a significant positive correlation with BMI and static foot posture, and no significant difference was observed with static foot posture with gender. According to the aforementioned correlations we observed that, early detection and self-awareness about their current BMI and how their foot postures have been altered, is essential in preventing future musculoskeletal disorders and improving quality of life.