

## **Foot-type analysis and plantar pressure differences between obese and nonobese adolescents during upright standing.**

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This study aimed to characterize the effect of obesity on foot-type and plantar pressure distribution in adolescents. Ten obese adolescents (obese group; BMI  $35.35 \pm 4.73 \text{ kg/m}^2$ ) and eight normal-weighted adolescents (control group; BMI  $18.67 \pm 2.46 \text{ kg/m}^2$ ) were recruited. Both groups were evaluated while standing using the Pedar-X in-shoes system. Foot-ground contact was characterized using contact area, peak of force and pressure calculated for the subareas of the foot. The analysis showed that obese participants had significantly higher area of contact in forefoot and midfoot (only in medial area) regions in comparison with the control group, whereas no statistically significant differences were observed for the rearfoot region. As far as the maximum pressure and force was concerned, similar results were obtained for both groups. Obese participants showed higher values for all the regions, with the exception of medial rearfoot area, for which the values were similar between the two groups. The analysis of foot-type distribution displayed that in the obese group high percentage of participants presented flat foot (70%) respect to cavus foot (20%) and normal foot (10%); on the contrary, in the control group, foot-types were markedly different, with 25% of participants with flat foot, 25% with cavus foot and 50% with normal foot. These results are important from a clinical perspective to develop and enhance the rehabilitative options in these patients and to avoid a worsening of their foot abnormalities. Untreated flat foot can in fact be disabling and over time can result in significant difficulties for the patients.

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