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Normal Pedobarography Values in a Multiracial Community of Malaysia: A Cross-Sectional Study

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Abstract

Introduction: While pedobarography is emerging in Malaysia for foot-related clinical and research use, there are no published normative foot plantar pressure values. This study aimed to identify pressure values and areas of distribution in the normal foot of the multiracial population in Pahang, Malaysia. The differences by ethnic groups, gender, and BMI levels were also investigated. **Materials and methods:** In this cross-sectional study, 600 normal feet without pre-existing diabetes mellitus and any lower limb and spine pain were assessed using Emed-q100 pedobarography platform device and EMED/E (Expert) software from January 2018 to December 2018. The data were analysed using SPSS, with descriptive statistics for demographics and foot pressure, Pearson Chi-Square for associations, t-tests for gender differences, and one-way ANOVA for comparisons across ethnicity and BMI groups. **Results:** The mean maximum peak pressure (MPP) was measured at 508.98 kPa (SD 164.06) with significant differences by BMI whereby the score was highest in the obese ($p < 0.001$). No

significant differences by gender and ethnicity were reported. In terms of peak pressure area (PPA), most (42.2%) were observed in the first metatarsal head and big toe region (1MH&T), followed by second metatarsal head (2MH) (31.5%). For overweight and obese, PPA mostly distributed in 2MH (34.8% and 50%, respectively). Significant differences in PPA were also seen between races. There was no significant difference in the pressure area distribution by gender. Conclusion: The MPP is affected by BMI while PPA distribution is affected by BMI and ethnicity. These findings can be used as an initial reference for further studies related to orthopaedic clinical applications, particularly involving the Malaysian population with various ethnicities and cultural backgrounds. © 2025, Malaysian Orthopaedic Association. All rights reserved.

Author keywords

BMI; demographic factors; foot pressure; pedobarography; plantar pressure

Indexed keywords

EMTREE medical terms

adult; Article; biomechanics; body mass; cross-sectional study; diabetes mellitus; female; human; information security; limb deformity; lower limb; major clinical study; Malaysia; male; Pedobarography; people of mixed ancestry; plantar pressure; pressure; spine malformation

Device trade names

Commercial names given to devices, used for branding and differentiation in the market, commonly referenced in scientific and clinical research.

Tradename	Country	Manufacturer
Expert Emed-q100 pedobarography platform device		
IBM SPSS version 24		IBM
Expert software		

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