

THE OFFLOADING EFFECTS OF METATARSAL PADS: A COMPARISON OF METATARSAL PAD DESIGNS

Li-Ying Zhang^{1,2}, Kit-Lun Yick^{1,2}, Joanne Yip¹, Sun-Pui Ng³

¹ *School of Fashion and Textiles, The Hong Kong Polytechnic University, Hong Kong, China*

² *Laboratory for Artificial Intelligence in Design, Hong Kong Science Park, New Territories, Hong Kong, China*

³ *School of Professional Education and Executive Development, The Hong Kong Polytechnic University, Hung Hom, Kowloon, Hong Kong, China*

Presenting author E-mail: 20113305r@connect.polyu.hk; Corresponding author email: tcyick@polyu.edu.hk

Metatarsal heads region is impressionable to high pressure which might lead to inflammation and pain. For people who perform high intensity sports and elderly population, this may lead to severe foot problems, like forefoot pain and ulcer. Metatarsal pads are prescribed to offload the abnormal plantar pressure, thus reducing pain and risk of foot ulcers in the metatarsal region. Considering the wide range of materials and design features available in the market, the offloading performance metatarsal pads were systematically investigated in this study.

Laboratory wear trials were conducted to collect the plantar pressure distributions with different metatarsal pad conditions by using in-shoe Pedar® system. The plantar of the foot was also divided into 5 areas for detailed analysis. Mean peak pressure of the whole and the regional plantar at different metatarsal pad conditions is statistically analysed.

The findings suggest that silicone pad with teardrop shape placed under the distal metatarsal heads showed the best offloading effect, especially in the metatarsal area. The abnormal plantar pressure under metatarsal heads region can be reduced by using metatarsal pads. The results contribute to providing the key design features of metatarsal pad for offloading purpose.

Keywords: Metatarsal Pad, Plantar Pressure, Foot Pain, Offloading

Note: The above abstract is selecting a review for PowerPoint presentation only, at the conference.