

Panupol Ratanapanadda 2009: Effect of Forefoot Midsole on Ground Reaction Force and Impulse during Running. Master of Science (Sports Science), Major Field: Sports Science, Interdisciplinary Graduate Program. Thesis Advisor: Assistant Professor Siriporn Sasimontongkul, Ph.D. 111 pages.

The injuries of the foot and lower extremities relate to ground reaction force (GRF) applied to the foot during push-off phase of running. Wearing running shoes inserted with cushioning material in the midsole of the forefoot may help prevent injury. Therefore, this research aimed to study the effect of running shoes, where either phylon or encapsulated air were inserted in the midsole at the forefoot, on the magnitudes of GRF and impulse. Thirty male runners, aged 17-25 years old, participated in the study. They wore each shoe while ran across a forceplate at a speed of 3.5-4 m/s and at a fastest speed. Moreover, their right foot had to hit in the middle of the forceplate to record vertical GRF and anterior-posterior GRF. The sampling rate of GRF was set at 1000 Hz. Next, maximum vertical GRF, antero-posterior GRF and horizontal impulse were computed. The statistical differences were tested using Two-way ANOVA with repeated measure and Two-way MANOVA with repeated measure. The significant was set at .05

The results showed that the shoes inserted with air in the midsole of the forefoot did not decrease vertical GRF more than shoes inserted with phylon. Therefore, shoes with encapsulated air in their forefoot are not more effective in injury prevention of the foot than phylon shoes. Moreover, both shoes induced an equal amount of breaking and push-off impulses.

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