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Evaluation of pressure insoles during running

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Abstract

Pressure insoles could be a useful tool for measuring vertical ground reaction forces during field tests. However, several studies have indicated problems that can affect the reliability of the output of the insoles. The aim of this study was to test the reliability, durability and repeatability of Tekscan F-scan pressure insoles with 2 running tests in combination with walks across and jumps on a force platform. During the both running tests in this paper the sensitivity of the pressure insoles deteriorated rapidly. A comparison of the force output of the pressure insoles and force platform during walks and jumps showed clear differences in both the shape and magnitude of the force curves. The rapid decrease in sensitivity and frequent need of calibration of the pressure insoles make the pressure insoles not reliable and practical enough for measuring vertical ground reaction forces during running.

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1. Introduction

To gain knowledge of the loading on the musculoskeletal system during various movements it is essential to collect biomechanical data. This provides information on the forces that act on specific parts of the body and can give insight on possible risk factors for injuries or how to improve performance.

One of the key problems when collecting biomechanical data is that tests performed in a laboratory environment are limited to the available space. Therefore performed movements are bound to several restrictions, which can make it difficult to perform the movements naturally. Consequently it is questionable how valid the outcomes will be for actual in-game scenarios.

On the other hand, field tests are also limited by several factors. Not all equipment is suitable for use outdoors or difficult to incorporate in a realistic environment, for example a grass soccer pitch. Pressure insoles could provide a practical outcome for collecting data on the experienced vertical ground reaction forces (vGRF). Since the insoles are put in the shoe they can be used in the laboratory or field. An other advantage is that the data collection unit is small, which means that it has easy transportability. However, while some previous studies have used these insoles

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