Accuracy of Various Newer Pedometers Placed at Different Body Sites

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Category: Masters

ABSTRACT

Introduction: Pedometers are increasingly used as a self-monitoring aid for achieving and increasing daily physical activity. Older pedometers had varied levels of accuracy ranging from 0 to 45% difference and were needed to be positioned in a certain way (on the waist). Newer models can be placed anywhere on the body but its accuracy is unknown when they are placed at different bodily sites. **Purpose:** We determined the accuracy of various newer pedometers under controlled laboratory and free walking conditions. **Method:** A total of 40 subjects (20 male and 20 female) varying widely in age (18-61 years) and BMI (18-38 kg/m^2) were studied. The pedometers, including Omron HJ-320BULK, Omron HJ-324U, Life Source XI-25, Fitbit Ultra, and Virgin Health Miles, were placed at waist, at chest, in a pocket, and on an armband. The number of steps recorded with the pedometers was compared against those counted with a hand tally counter while the subjects walked on the treadmill at 54, 80, 107, 134, and 161 m/min and on paved ground outside at a self-selected pace. **Results**: Overall, all pedometers displayed values that were within 9% of actual steps in all conditions when they were placed at waist, chest, and armband. However, when they were placed in a pocket, step counts deviated significantly from the hand counts by > 11% in some models (Life Source, Fitbit, and Virgin Health) ($P<0.05$). There were no systematic differences in the accuracy at different walking speed or between men and women. **Conclusions:** All the pedometers examined were accurate when they were placed at waist, chest, and armband no matter what walking speed or what terrain they exercised. But some pedometers did not register accuracy when they were put in the pocket.