

심폐재활

게시일시 및 장소 : 10 월 18 일(금) 08:30-12:20 Room G(3F)

질의응답 일시 및 장소 : 10 월 18 일(금) 10:00-10:45 Room G(3F)

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Accuracy of Wearable Heart Rate Monitoring During Conventional Walking and Nordic Walking

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Objective

Nordic walking requires brisk grasping and releasing of a walking pole, and the heart rate (HR) extraction from a wrist-band-type may not be sufficiently accurate during Nordic walking. The accuracy of chest-strap type and wrist-band type wearable devices measuring HR during Nordic walking have not yet reported. We investigated the accuracy of both wearable devices during conventional and Nordic walking, and the accuracy results were compared according to walking types.

Methods

Fifteen volunteers (all men; aged 23.7 ± 3.0 years) performed conventional walking and Nordic walking while wearing 12-electrocardiographic leads, a Polar H7 chest-strap monitor, and a Fitbit Charge 2 wrist-worn monitor. The accuracy of the Polar H7 and Fitbit Charge 2 was assessed against electrocardiographic HR measurements, and agreement was assessed using Lin's concordance correlation coefficient (rc), mean absolute difference, and limit of agreement (LoA) from the Bland–Altman plot.

Results

For both walking methods, Polar H7 agreed better with ECG (rc = .96) than did Fitbit Charge 2 (rc = .84). The mean absolute difference of Polar H7 was not significantly different between walking methods, but that of the Fitbit Charge 2 was significantly higher during Nordic walking than conventional walking (6.60 vs. 3.68 bpm, respectively; $P < .001$). The LoA of the Fitbit Charge 2 was wider than for the Polar H7 during both walking methods.

Conclusion

HR measurements of chest-strap monitor agreed well with the ECG measurement during both conventional walking and Nordic walking, but the accuracy of a wrist-band monitor varies between walking methods.

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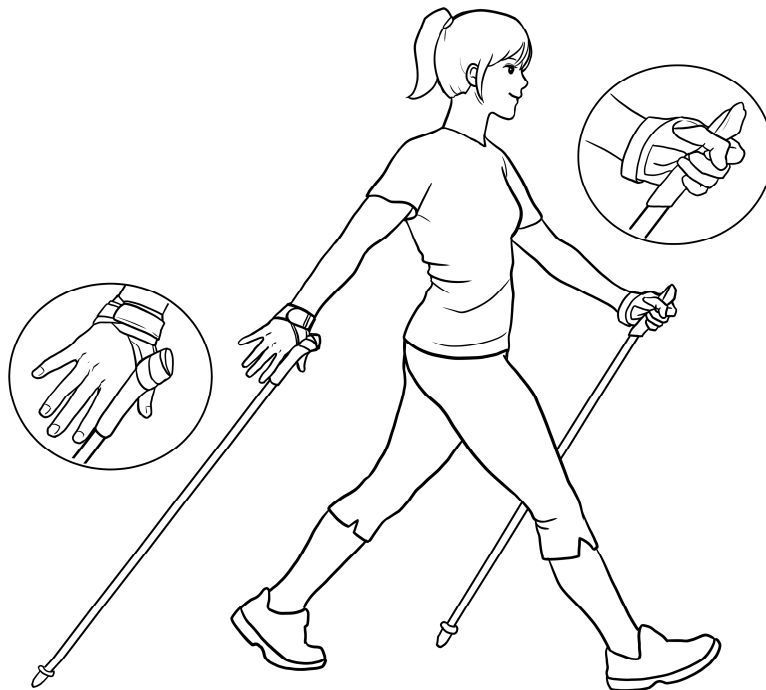


Fig. 1. Hand movements during Nordic walking.

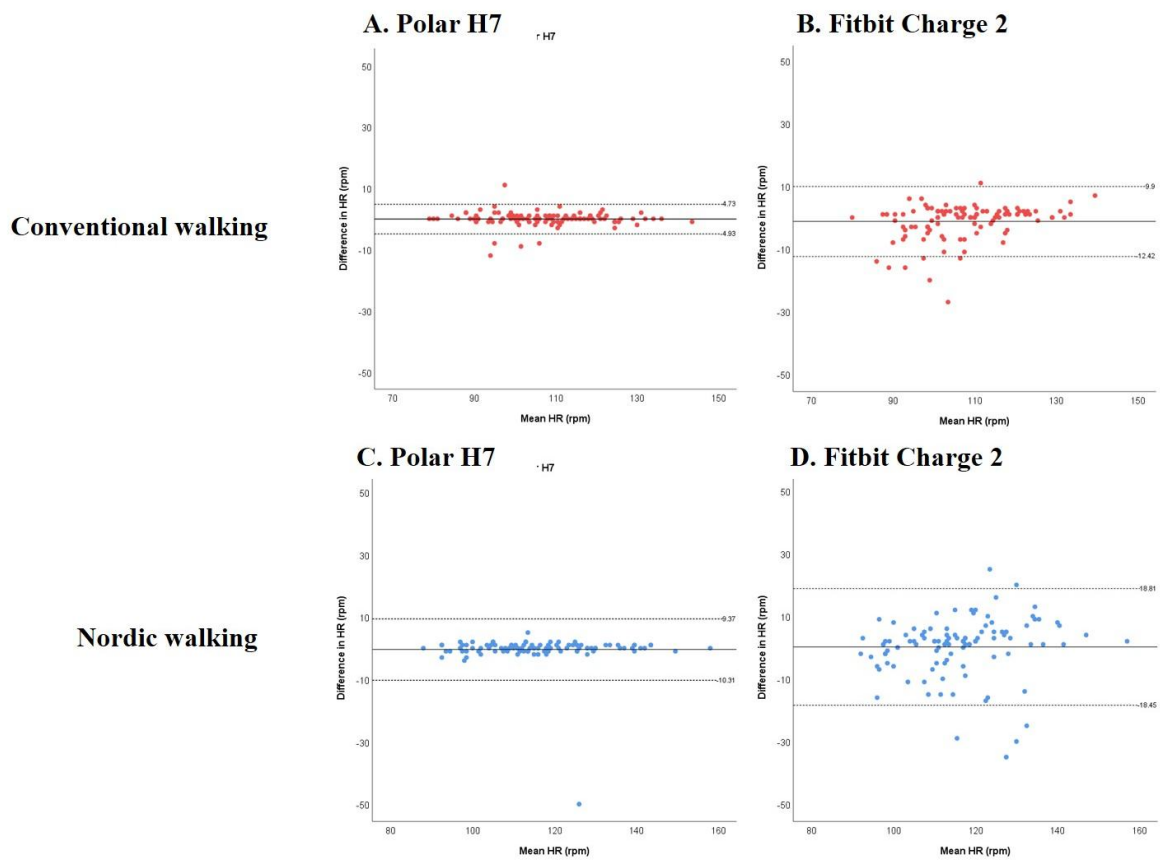


Fig. 2. Bland–Altman Plots and 95% limits of agreement with electrocardiograph (ECG)–measured heart rate (HR) for conventional walking (A, B) and Nordic walking (C, D).