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## Validity of the Fitbit Charge HR2 for Measuring Step Count and Heart Rate During Exercise

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Wearable activity trackers have gained popularity over the past decade, developing into a multi-billion dollar industry. The potential of these devices to support behavior change interventions are promising. Yet, before such interventions can be considered, the examination of the validity of fitness trackers is imperative. The present study examines one of the most popular devices in the market, the Fitbit Charge HR2, which was released in 2016. Currently, there is a lack of evidence of its validity to track activity indicators (e.g., heart rate, steps). **PURPOSE:** To test the validity of the Fitbit Charge HR2 monitor in step count and heart rate (HR) during exercise. **METHODS:** Thirty-two healthy volunteers (age 22.7±6.1, 20 female) participated in the study. Participants completed four 6-minute trials (i.e., lying in a supine position and moving at 3.5, 5, and 6.5 miles per hour (mph) on a treadmill). Data were collected on the Fitbit Charge HR2, a Polar H7 chest strap, and by a count of videotaped steps. Statistical analyses included mean absolute percentage errors, one-sample t-tests, and intraclass correlation coefficients (ICC). **RESULTS:** The Fitbit Charge HR2 significantly underestimated HR for all four trials (mean differences=-1.7- -12.7, SDs=9.3-18.4; *ps*<.01). For HR, ICCs ranged from .44-.66, indicating only modest agreement between the Fitbit and the Polar H7 chest strap. The Fitbit Charge HR2 also significantly underestimated step count for walking at 3.5 mph (mean difference=-13.0, SD=19.0; *p*<.01) with an acceptable ICC (.77). However, for running at 5 and 6.5 mph, no significant underestimation was found. Accordingly, the ICCs revealed an excellent agreement of .99 between the Fitbit and counted steps for both trials. **CONCLUSION:** The Fitbit Charge HR2 acceptably measured step count for moving at jogging or running speeds. For the measurement of HR and step count at lower speeds the accuracy was questionable and the use of other devices may be advisable.