

## The Efficacy of Wristband Activity Trackers during Vigorous Exercise

JESSICA MCDOWELL, ALEXANDREA SWIZE, JENNA GERBER, REILLY AVALOS, KYLE REINEN, and SHELLY D. WEISE

Clinical Exercise Physiology, Prevention & Wellness Lab; Department of Physical Therapy; Angelo State University; San Angelo, TX

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Advisor / Mentor: Weise, Shelly ([shelly.weise@angelo.edu](mailto:shelly.weise@angelo.edu))

### ABSTRACT

Patients and clinicians rely on activity trackers to monitor heart rate, calorie expenditure, and steps during training and interventions. However, the efficacy of activity trackers during vigorous exercise, is not widely studied. **PURPOSE:** The objective of this study was to compare the effectiveness of activity trackers during vigorous activity. **METHODS:** Nineteen participants completed twenty minutes of vigorous intensity exercise by running or incline walking on a treadmill. Measurement devices worn during the testing period included two wristband activity trackers (Garmin (G) Forerunner 735xt™ and Fitbit (F) Surge™) and industry standard devices: a pedometer (P), Polar™ HR Chest Strap and Cosmed (C) Quark CPET face mask. **RESULTS:** No significant difference was found among the devices or industry standard for step count (STPG = 3096.56+/-380.05; STPF = 3072.72+/-353.26; STPP = 3052.44+/-408.52). No significant difference was found between the two trackers and the industry standard for energy expenditure (KCALG = 249.19+/-61.06; KCALF = 211.88+/-34.43; KCALC = 234.07+/-64.24). However, there was a significant difference between the two trackers for this same variable. At multiple times throughout the testing period, a significant difference was noted between the activity trackers and industry standard for heart rate. All testing significance was set at  $p < 0.05$ . **CONCLUSION:** This study sought to examine the efficacy of personal activity trackers as compared to industry standards during vigorous exercise. Both devices proved accurate in measuring steps and energy expenditure but proved inconsistent when monitoring heart rate.