



Lay summary: Estimating physical activity and sedentary behaviour in a free-living environment: a comparative study between Fitbit Charge 2 and Actigraph GT3X

Reference: Estimating physical activity and sedentary behaviour in a free-living environment: a comparative study between Fitbit Charge 2 and Actigraph GT3X Marie-Louise K. Mikkelsen, et al., *PLOS One* (2020). DOI: 10.1371/journal.pone.0234426

Why is this study important? Research on physical activity has historically relied on self-reported data, which have been found to be very inaccurate. Activity trackers provide an opportunity to objectively measure physical activity and commercial trackers are becoming increasingly popular to use in research as they are often cheaper than research-grade trackers and provide cloud storage and immediate feedback to the user. One of these activity trackers is the Fitbit Charge 2. The accuracy of this device in a free-living environment is largely unknown.

What did we do? This study included 41 Danish adults (n=10 males, n=31 females) who were asked to wear a Fitbit Charge 2 on the wrist and an ActiGraph GT3X on the hip for 7 consecutive days and fill out a log of wear-times. Outputs on steps, energy expenditure, sedentary time, light physical activity and moderate-to-physical activity were compared to assess agreement between the two devices.

What did we find? The devices showed to agree well on sedentary time while moderate disagreement was found on steps. Substantial differences between devices were found for energy expenditure, light activity and moderate-to-vigorous physical activity.

What does it mean? Considering the discrepancies between Fitbit Charge 2 and Actigraph GT3X, the Fitbit Charge 2 may not be optimal for clinical research. However, it may be appropriate for studies using the immediate feedback function and be helpful in setting goals and monitoring individual progress.