Fitbit-Paper:

**Authors:** Runge, Haarmann & Fisher (2020)

**Journal:** International Journal of Social Policy and Education

**Title:** Using Fitbit Fitness Trackers to Measure Teacher Stress and Coping

* There is research that uses Fitbit technology to measure exercise and its effect on stress (Xu, et al., 2018) and the use of wearable devices to measure mental health outcomes (Knight & Bidargaddi, 2018), but there is a gap in literature to support teachers using Fitbits to pinpoint stressful occurrences in their daily work.
* Ferguson et al. (2015) found that Fitbit products were just as favorable and more affordable
* Research has shown that the variability in heart rates can predict stress levels since heart rates increase during stressful situations (Taelman, Vandeput, Spaepen, & Van Huffel, 2009)
* The average resting heartrate (HR) was measured in beats per minute (bpm) and ranges from 40 to 100 bpm in healthy adults. The average resting heart rate is calculated when at rest throughout the 24-hour period of one day.
* In terms of steps, average adults range from 5,000 to 7,000 steps per day with more active adults many times acquiring over 7,000.

**5.3 Fitbit Results**

* Line graphs were constructed to manage all data for each individual teacher.
* The numbers on the x-axis represent the weeks that Fitbit data was collected.
* The left y-axis represents the average amount of sleep for the week in hours, and the average amount of steps for the week (divided by 1000 to fit onto the table).
* The right y-axis represents the average resting heart rate for the week in beats per minute. The dotted lines represent the teacher’s overall average of sleep (dark grey), steps (black), or heart rate (light grey) throughout the study. We chose to define high levels of stress by weeks indicating above average heart rate, above average step count, and below average sleep.

Limitations:

* Small sample size (*N* = 4 teachers)

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**Authors:** Muggeridge et al (2020)

**Journal:** JMIR Mhealth Uhealth

**Title:** Measurement of Heart Rate Using the Polar OH1 and Fitbit Charge 3 Wearable Devices in Healthy Adults During Light, Moderate, Vigorous, and Sprint-Based Exercise: Validation Study

* Age and gender as a control variable
* Depending of the numbers of studies available different age groups will be analyzed independently (e.g., 18-45 years old, 45-65 years old, over 65 years old)
* Age range will be defined according to the mean age reported in each individual study
* placement of the Fitbit device [device up to three finger widths above the wrist bone; see (33)]
* the validation of multiple devices simultaneously (validation study including one device at a time
* the description of missing data (percentage of missing data for each analysis described)
* beat per minutes (bpm), and difference of steps per minutes (steps/min)?

**Own Study:**

**Abstract:**

**Background:**

low-cost, non-invasive, wrist-worn devices

**Objective:**

The aim of the study was to monitor the heart rate and step counts of *N* = 80 teachers.

**Methods:**

40 expert teachers and 40 novice teachers were asked to teach a 15minute micro-teaching unit in a laboratory study whereas three actors represented the class. During the unit, the actors performed nine typical classroom disruptions. The subjects’ heart rate and steps were measured with a Fitbit Charge 4.

**Results:**

**Conclusions:**