

Research on physical activity variability and changes of metabolic profile in patients with prediabetes using Fitbit activity trackers data

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ABSTRACT

BACKGROUND: Monitoring physical activity is one of the possibilities to control a patient's self-care and adherence to recommendations. There are many consumers wearable technologies to track steps, heart rate, and other parameters. However, we still lack clinically approved methods, software, and data analysis technologies to collect data and make it suitable for practical use for patient care.

OBJECTIVE: The aims of this study are to analyze the potential of patient physical activity monitoring using Fitbit physical activity trackers and find solutions for possible implementation in the health care routine.

METHODS: 30 patients with impaired fasting glycemia were randomly selected and participated for 6 months. Physical activity variability was evaluated and parameters were calculated using data from Fitbit Inspire devices.

RESULTS: Changes in parameters were found and correlation between clinical data (HbA1c, lipids) and physical activity variability were assessed. Better correlation with variability than with body composition changes shows the potential to include nonlinear variability parameters analysing physical activity using mobile devices. Less expressed variability shows better relationship with control of prediabetic and lipid parameters.

CONCLUSIONS: Evaluation of physical activity variability is essential for patient health, and these methods to calculate it is one effective way to analyze big data from wearable devices in future trials.

KEYWORDS: Fitbit, Poincaré plot, variability, physical activity monitoring, pre-diabetes.