The new era of digital-based research: Lessons learned with recommendations provided
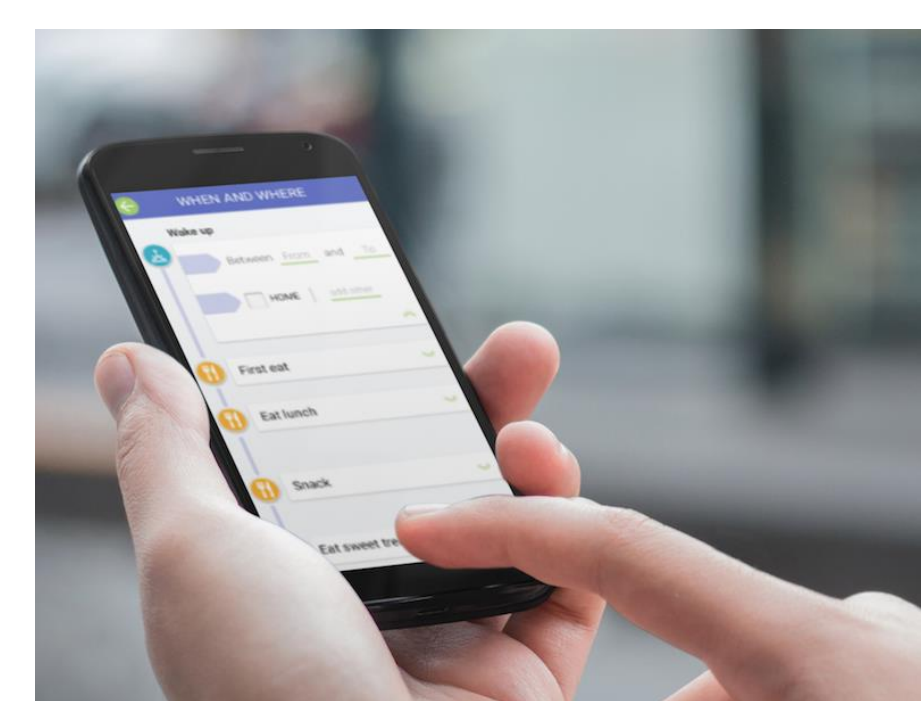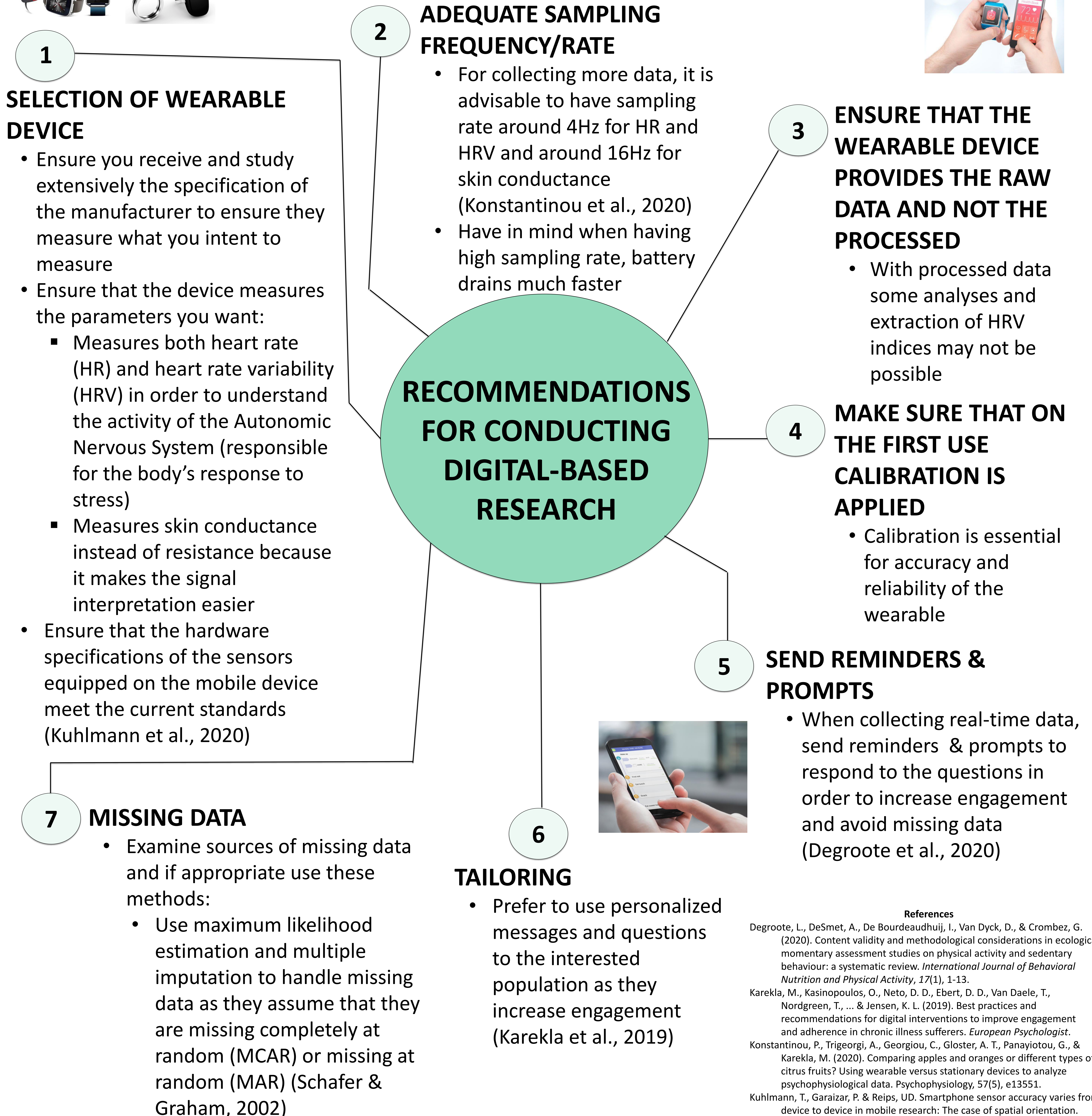
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RECOMMENDATIONS FOR CONDUCTING DIGITAL-BASED RESEARCH

1

SELECTION OF WEARABLE DEVICE

- Ensure you receive and study extensively the specification of the manufacturer to ensure they measure what you intent to measure
- Ensure that the device measures the parameters you want:
  - Measures both heart rate (HR) and heart rate variability (HRV) in order to understand the activity of the Autonomic Nervous System (responsible for the body's response to stress)
  - Measures skin conductance instead of resistance because it makes the signal interpretation easier
- Ensure that the hardware specifications of the sensors equipped on the mobile device meet the current standards (Kuhlmann et al., 2020)

2

ADEQUATE SAMPLING FREQUENCY/RATE

- For collecting more data, it is advisable to have sampling rate around 4Hz for HR and HRV and around 16Hz for skin conductance (Konstantinou et al., 2020)
- Have in mind when having high sampling rate, battery drains much faster

3

ENSURE THAT THE WEARABLE DEVICE PROVIDES THE RAW DATA AND NOT THE PROCESSED

- With processed data some analyses and extraction of HRV indices may not be possible

4

MAKE SURE THAT ON THE FIRST USE CALIBRATION IS APPLIED

- Calibration is essential for accuracy and reliability of the wearable

5

SEND REMINDERS & PROMPTS

- When collecting real-time data, send reminders & prompts to respond to the questions in order to increase engagement and avoid missing data (Degroote et al., 2020)

6

TAILORING

- Prefer to use personalized messages and questions to the interested population as they increase engagement (Karekla et al., 2019)

7

MISSING DATA

- Examine sources of missing data and if appropriate use these methods:
  - Use maximum likelihood estimation and multiple imputation to handle missing data as they assume that they are missing completely at random (MCAR) or missing at random (MAR) (Schafer & Graham, 2002)

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