

Implementing remote measurement technology in clinical pathways for depression, epilepsy and MS: Results from a large-scale survey of clinicians

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Background

Remote Measurement Technology (RMT) uses the sensors and software found in wearable and mobile devices to record data on biological indicators, while additionally enabling collection of self-report data¹. These data can be used to gain insight into a person's physical and psychological health. However, little guidance is available to direct the use of RMT in healthcare settings and not much is known about how, or whether, data from these devices are currently being used in such settings².

The RADAR-CNS project seeks to explore the potential of RMT in epilepsy, depression and multiple sclerosis (MS)³. The present study seeks to explore the potential value of RMT for the management of these conditions, according to clinicians working in these specialisms.

Methods

Our primary objective was to understand if RMT interventions are **currently used** in clinical practice.

Our secondary objective was to understand where healthcare professionals believe there to be **potential** for the use of RMT in healthcare.

We conducted an online survey of clinicians working in the care of people with epilepsy, MS or depression. Recruitment to the survey was completed with assistance from the Clinical Research Network, also via social media and contacts of the research team.

Ethical approval was granted by the University of Nottingham Research Ethics Committee, and approval was granted by the Health Research Authority for involvement of the Clinical Research Network.

There were 1009 responses to the survey, and after data cleaning 1006 were retained for analysis in Microsoft Excel.

Results

A total of 562 respondents (56%) reported using apps of some kind in their current clinical practice. Types of app reported to be used included guidelines apps (25% of respondents), calculation apps (11%), prescribing/dosing apps (19%) and communication apps (22%) (Figure 1).

A total of 780 respondents (78%) reported that their patients used smartphone apps or a wearable sensing device for health-related purposes, consisting of: weight management; sleep monitoring; activity monitoring; monitoring for a specific condition; monitoring mood; setting personal health goals; or another health-related use.

When asked whether data from their patients' devices impacted aspects of their practice, **the majority of responses (average 62%) indicated that patients' data sometimes or definitely impacted their work** (Figure 2).

The survey also showed that **clinicians would find RMT data on sleep quality to be of use across all three of the central nervous disorders considered in this study** (89% of respondents in epilepsy, 84% in MS and 96% in depression).

Analysis of responses revealed a largely positive attitude towards RMT, where **86% of respondents agreed or strongly agreed that 'technology is a good tool for helping patients to manage their condition themselves'**.

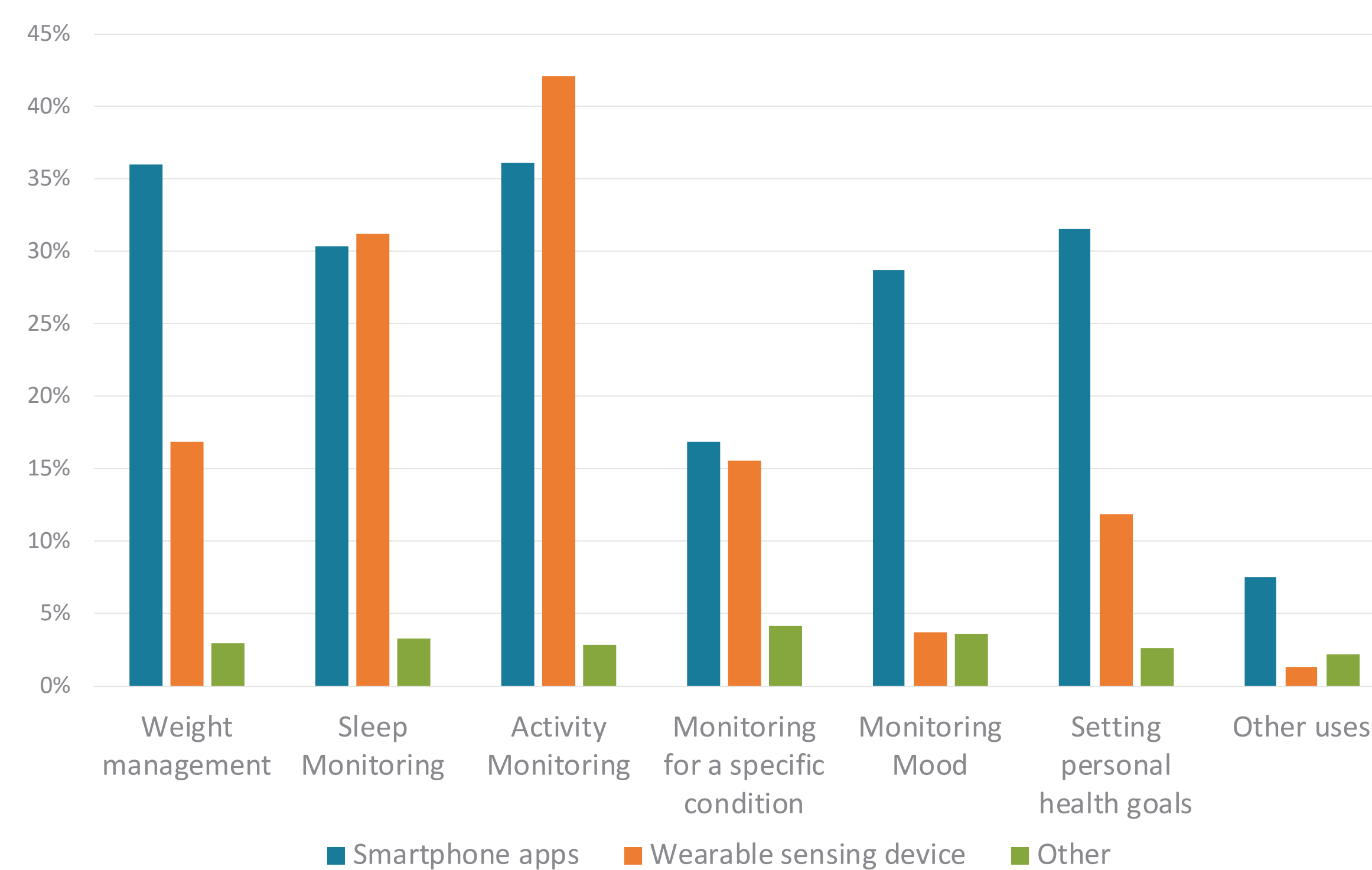


Figure 1 | Percentages of respondents indicating they have experienced their patients bringing data to clinic that have been collected using smartphones or wearable devices for these purposes.

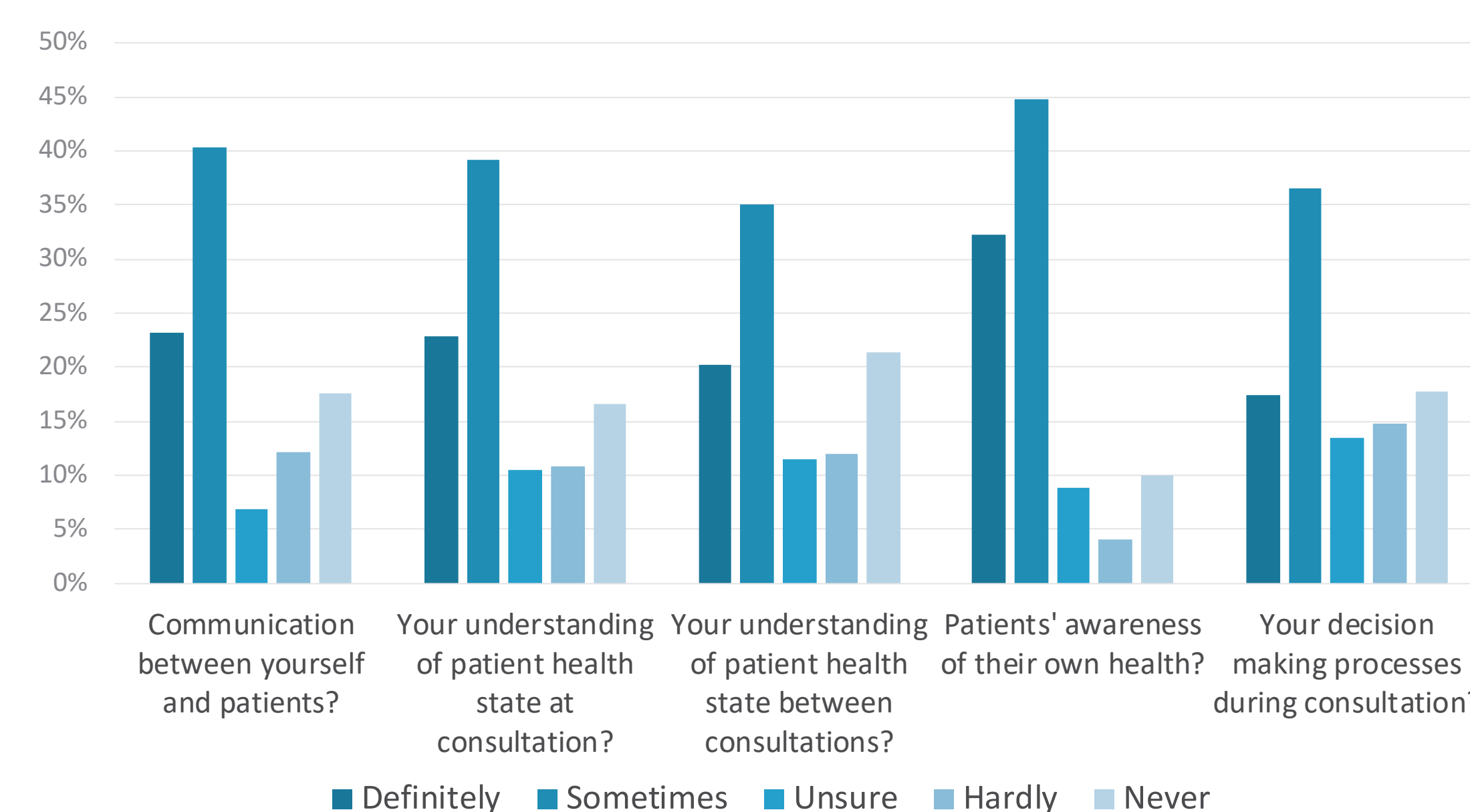


Figure 2 | Respondents' views of whether patients' data collected on apps and wearable devices affects different aspects of their clinical work. The majority of responses indicated that patients' RMT data were sometimes, or definitely useful for their clinical practice.

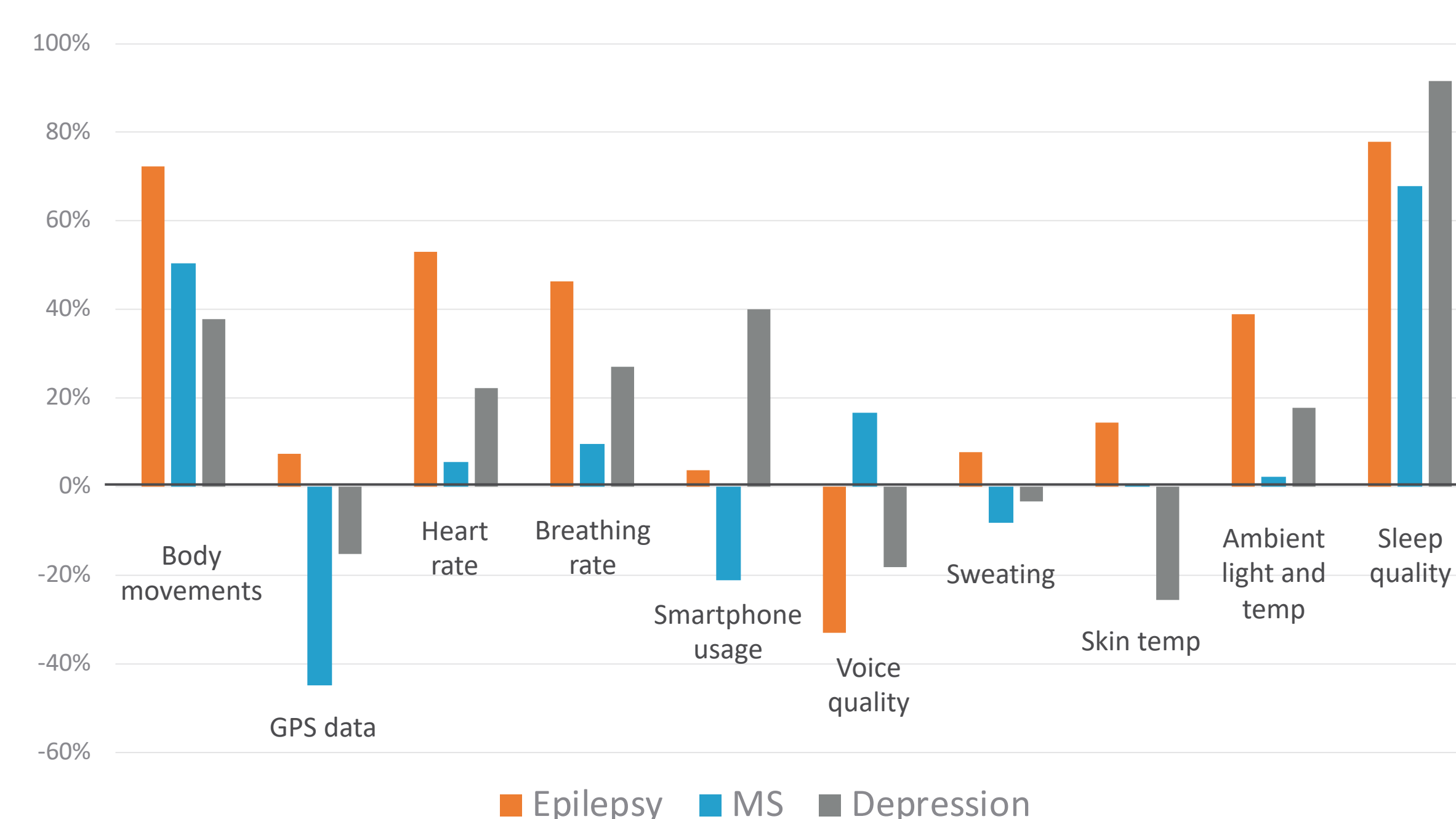


Figure 3 | Respondents' views on the usefulness of different types of data that could be collected using RMT, across three different central nervous system disorders. Percentages plotted here are results of subtracting percentage of 'no' responses from percentage of 'yes' responses in each data type and each condition. Thus bars above the x axis were more positively endorsed, while bars below the x axis were more negatively endorsed.

We asked respondents to indicate types of data that they would like their patients to measure using RMT.

Responses included:

- Activity levels
- Alcohol intake
- Anxiety symptoms
- Appetite
- Blood glucose
- Cognitive performance
- Diet/calorie intake
- EEG
- Goals and achievement
- Heart rhythm
- Smartphone usage
- Interaction with others
- Medication usage and adherence
- Micturition and bowel movements (MS)
- Mood
- Mindfulness/relaxation
- Seizure frequency (epilepsy)
- Social media usage
- Ability to swallow (for MS and epilepsy)
- Walking speed

Conclusions

More than 50% of clinicians already use apps in their clinical practice, and over 75% of them report that their patients use smartphone apps or wearables for health-related purposes. Most respondents also indicate that data from patients' apps and wearables impact their work. Clinicians see promise in the use of RMT to help patients self-manage their conditions.

It would therefore be timely for guidance to be produced on the use of RMT data, both for clinical practice and for patients to self-manage their condition. Our results also provide evidence of a need for pathways and software to manage data from patients' RMT.

Results indicated potential for RMT in all three conditions of interest, with variation in the particular data streams that would be of most use in each condition. Thus, patients and clinicians would benefit from condition-specific guidance as well as general guidance on principles of good practice with digital data.

References

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