Wearable sensors for clinical applications in stroke, Parkinson's disease and epilepsy

A mixed-methods systematic review

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The aim

of this systematic review was to synthesize knowledge from quantitative and qualitative clinical research using wearable sensors in stroke, Parkinson's disease (PD) and epilepsy (EP).

A systematic review of literature (1995 -2017)

Results

Adherence rate varied between 61-95 % (6 studies)

Missing and incomplete data varied between 4-24% and included both technical failure and human error (12 studies)

3 analytic themes reflecting user experience, acceptance and preference towards wearables emerged

Acceptable integration in daily life – Attitudes towards wearables were positive. The wearables did not hinder activities and were in general accepted. It was important that the sensors could be removed at any time. Fastening the sensors with straps could be problematic.

Lack of confidence in use – The readiness to use was strongest for unnoticeable devices similar to ordinary items (watches, clothes) since the public appearance was important. The users were concerned about wearing the wearables incorrectly, confronting technical failures and felt a need of technical support and feedback.

The need to consider individuation – A wide spectrum of preferences were reported. The wearables should be small, non-obtrusive and waterproof. Wanted features were real-time feedback, reminders to take medication, assistance in training.

Conclusions Wearables may provide information of clinical features of interest in stroke, PD and epilepsy. The knowledge regarding the clinical utility and usability, for supporting clinical decision making, remains to be established.

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