Utilization of Wearables and Trends in mHealth in Current Clinical Research of Neurologic Conditions

Karen Chan, PharmD; Avantika Pathak, PharmD; Eunjoo Pacifici, PhD

Objective: To analyze how wearables are used in clinical research, specifically how they are contributing to endpoint analyses (intervention vs. measurement tool) in the areas of neurologic disorders, mental health disorders, substance use disorders, and musculoskeletal pain.

Method:
- Selected 175 studies from a clinicaltrials.gov search using the term "wearable" in each of the four clinical areas
- Recorded trial characteristics, including type and utilization of the wearable
- Conducted a literature search on pubmed.gov to survey wearable trends

Results: Of the included 114 trials
- 61 trials studied wearables as the intervention
- 53 trials used wearables as a measurement tool for a different intervention
  - These were categorized by their intervention type: drug, device, disease state, dietary supplement, behavioral therapy, and other therapy

Conclusion: Our findings suggest that not only are wearables being studied as interventions, but they are also being used as measurement tools for other interventions such as drugs, behavioral therapy, and devices. Their ability to obtain usable and actionable health markers from large pools of data and their growing diversity in capability is demonstrating their clinical utility. We believe our research provides a more in-depth analysis of how wearables are being used as an intervention for neurologic conditions and a reliable tool to capture endpoints for other treatments in this clinical area.

As an intervention, e.g. an app is being studied for its effects on the improvement of sleep in post-traumatic stress disorder-related sleep disturbance.

As a measurement tool, e.g. a wearable biosensor that quantifies emotional arousal through skin conductance for the primary endpoint of a behavioral therapy intervention.