
Supporting the Use of Wearable Data in the Mental Health Clinic

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Abstract

Our recent study on the envisioned uses of Fitbit data by veterans with PTSD and their therapists identified potential uses for sensor-captured patient-generated data (sPGD) in mental health clinical settings as well as barriers to their actualization. While therapists envisioned wearables enhancing current standards of care, gleaning meaningful information from large quantities of data would likely require the assistance of an AI. The set up and training of this AI will introduce new processes and workflows for therapists and potentially labor by patients who may be in a vulnerable state. Our future research will investigate how to design for the use of consumer tracking devices in mental health clinical settings. In this workshop, I hope to discuss design considerations for AI in a field where having large quantities of automatically tracked data is not the clinical norm and how to design in anticipation of unintended consequences when integrating new mental health technologies.

Author Keywords

mental health; wearables; post-traumatic stress disorder; sensors; artificial intelligence; patient-generated data

CCS Concepts

•Human-centered computing → Human computer interaction (HCI);

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Opportunities for Sensor Data in Mental Health

Prior research at the intersection of consumer wearables and mental health have mainly focused on the health impacts of personal use of such devices [1, 2], but recently there has been a growing body of research highlighting how the data can be used in clinical settings. In a recent study we conducted on the potential use of Fitbits in care for veterans with PTSD, therapists identified both envisioned and actualized uses for reviewing and discussing sensor-captured patient-generated data (sPGD) from the wearable [3, 4]. For example, learning about how heart rate changes during a stressful situation offers opportunities for the therapist tailor their therapeutic intervention and for the patient to self-monitor with guidance from the therapist. However, clinicians currently do not have the capacity to sift through large quantities of sPGD to find insights pertinent to their patient's health. While AI is one way to identify moments that warrant clinician attention, the use of commercial wearables – originally designed to track signals associated with physical health in non-clinical contexts – for mental health care in the clinic requires human support.

Determining What Data to Capture

In a series of workshops “*Collaborative Healthcare Using Patient-Generated Data*,” academic and industry researchers and clinicians gathered to ideate how to capture use-cases for leveraging sPGD in the clinic [6]. From the start we realized how, unlike using sPGD for physical health (e.g. continuous blood glucose monitor), using sPGD to monitor mental health is not a direct digitization of traditional health information. The gold standard of mental health assessment is centered around self-reported symptom surveys which are manually completed by patients. Wearables would introduce a non-clinically validated form of information that clinicians are concerned could cause patient harm. Therefore, in order to identify opportunities

for the use of sPGD in treatment for PTSD, we proposed that a small handful of “power user” therapists identify potential uses for the data and assess its clinical utility. The findings from this pilot program could then be used to decide whether or not to integrate wearables into the care process and if it is to be used, define protocols for how to do so effectively. After these initial efforts to identify areas of opportunity for the data to support care processes, AI is likely to be leveraged to detect patterns within these areas and surface them at the appropriate time for intervention. However, fine-tuning the AI algorithms will require work on behalf of the therapist and/or patients.

Training by Humans

While AI may surface patterns in behavior, it is the context that is provided by patient-therapist dialogue that provides meaning in a space where the interpretation of data is highly subjective. For example, an elevated heart rate may be cause for concern if it is related to a panic attack, but not if it is related to exercise [5]. It may be possible that AI can triangulate multiple sources of data (heart rate monitor, galvanic skin response, and geolocation) and find correlations over time, however the burden of training an algorithm on whether a set of circumstances warrants attention will likely fall on the patient or therapist. In mental health care, where the patient-therapist rapport is integral to progress, time being diverted from developing this relationship to training an AI may be a negative unintended consequence.

Future Research

Our future research will be focused on designing for clinical interpretation of health data – how should information from wearables and AI be surfaced to therapists treating patients with PTSD? In order to gain a deeper understanding of how therapists might want to use wearable data and AI to support current clinical tasks, we plan to conduct a participa-

tory design workshop. We will then build and evaluate data representations with potential users to assess the designs' perceived value within mental health care processes.

Workshop Goals

In this *Identifying Challenges and Opportunities in Human–AI Collaboration in Healthcare* workshop, I hope to explore how designs for wearable data and AI should take into consideration social aspects of mental health processes. Furthermore, I hope to discuss the potential unintended consequences of new clinical workflows. Human intervention is still a necessary component of AI in health for the foreseeable future and we have more to learn about when, where, and how AI should intervene when it comes to mental health care.

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