

# Personal sensing at work: Tracking burnout, balancing privacy

November 16 2022, by Tom Fleischman

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Personal sensing data could help monitor and alleviate stress among resident physicians, although privacy concerns over who sees the information and for what purposes must be addressed, according to

collaborative research from Cornell Tech.

Burnout in all types of workplaces is on the rise in the U.S., where the "Great Resignation" and "silent quitting" have entered the lexicon in recent years. This is especially true in the [health care industry](#), which has been strained beyond measure due to the COVID-19 pandemic.

Stress is physical as well as mental, and evidence of stress can be measured through the use of smartphones, wearables and personal computers. But [data collection](#) and analysis—and the larger questions of who should have access to that information, and for what purpose—raise myriad sociotechnical questions.

"We've looked at whether we can measure stress in workplaces using these types of devices, but do these individuals actually want this kind of system? That was the motivation for us to talk to those actual workers," said Daniel Adler, co-lead author with fellow doctoral student Emily Tseng of "Burnout and the Quantified Workplace: Tensions Around Personal Sensing Interventions for Stress in Resident Physicians," which published in the *Proceedings of the ACM on Human-Computer Interaction*.

The paper is being presented at the ACM Conference on Computer-Supported Cooperative Work (CSCW) and Social Computing, taking place virtually Nov. 8-22.

Adler and Tseng worked with senior author Tanzeem Choudhury, the Roger and Joelle Burnell Professor in Integrated Health and Technology at the Jacobs Technion-Cornell Institute at Cornell Tech. Contributors came from Zucker School of Medicine at Hofstra/Northwell Health and Zucker Hillside Hospital.

The resident physician's work environment is a bit different from the

traditional apprenticeship situation in that their supervisor, the attending physician, is also their mentor. That can blur the lines between the two.

"That's a new context," Tseng said. "We don't really know what the actual boundaries are there, or what it looks like when you introduce these new technologies, either. So you need to try and decide what those norms might be to determine whether this information flow is appropriate in the first place."

Choudhury and her group addressed these issues through a study involving [resident](#) physicians at an urban hospital in New York City. After hourlong interviews with residents on Zoom, the residents and their attendings were given mockups of a Resident Wellbeing Tracker, a dashboard with behavioral data on residents' sleep, activity and time working; self-reported data on residents' levels of burnout; and a text box where residents could characterize their well-being.

Tseng said the residents were open to the idea of using technology to enhance well-being. "They were also very interested in the privacy question," she said, "and how we could use technologies like this to achieve those positive ends while still balancing [privacy concerns](#)."

The study featured two intersecting use cases: [self-reflection](#), in which the residents view their behavioral data, and [data sharing](#), in which the same information is shared with their attendings and program directors for purposes of intervention.

Among the key findings: Residents were hesitant to share their data without the assurance that supervisors would use it to enhance their well-being. There is also a question of anonymity, which was more likely with more participation. But greater participation would hurt the potential usefulness of the program, since supervisors would not be able to identify which residents were struggling.

"This process of sharing [personal data](#) is somewhat complicated," Adler said. "There is a lot of interesting continuing work that we're involved in that looks at this question of privacy, and how you present yourself through your data in more-traditional mental health care settings. It's not as simple as, 'They're my doctor, therefore I'm comfortable sharing this data.'"

The authors conclude by referring to the "urgent need for further work establishing new norms around data-driven workplace well-being management solutions that better center workers' needs, and provide protections for the workers they intend to support."

**More information:** Daniel A. Adler et al, Burnout and the Quantified Workplace: Tensions around Personal Sensing Interventions for Stress in Resident Physicians, *Proceedings of the ACM on Human-Computer Interaction* (2022). [DOI: 10.1145/3555531](https://doi.org/10.1145/3555531)

Provided by Cornell University

Citation: Personal sensing at work: Tracking burnout, balancing privacy (2022, November 16) retrieved 10 May 2024 from <https://medicalxpress.com/news/2022-11-personal-tracking-burnout-privacy.html>

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