Researchers use wearable devices to identify psychological effects of pandemic

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Health care workers with high resilience or strong emotional support were protected against the effects of stress related to the COVID-19 pandemic compared to those who had low emotional support or

resilience, according to a study published September 13 in the *Journal of Medical Internet Research*. Mount Sinai researchers also found that the number of individuals with COVID-19 in the community was a significant factor associated with stress in health care workers over time.

The Mount Sinai team found that high emotional support or high resilience—the ability to overcome difficulty and a reduced vulnerability to environmental stressors—resulted in a unique nervous system profile, demonstrating that these features impact both how health care workers perceive stress and how their bodies are physically affected by stress.

"Our study highlights the importance of emotional support and resilience in moderating the effects of stress on health care workers during the ongoing pandemic," said the study's corresponding author Robert P. Hirten, MD, Assistant Professor of Medicine (Gastroenterology) at the Icahn School of Medicine at Mount Sinai, and member of the Hasso Plattner Institute for Digital Health at Mount Sinai and the Mount Sinai Clinical Intelligence Center (MSCIC). "Assessing the resilience and emotional support of health care workers may be able to help identify those at risk from ongoing stressors and may help guide health care institutions in allocating mental health resources for these at-risk employees."

Several hundred study participants wore an Apple Watch that measured their heart rate variability and downloaded a customized app to complete weekly surveys measuring perceived stress, resilience, emotional support, quality of life, and optimism. Researchers found that health care workers with high resilience or high emotional support had different autonomic nervous system stress patterns compared with those who had medium or low emotional support or resilience. The autonomic nervous system is a primary component of the stress response and can be found by measuring heart rate variability. The participants' physiological results aligned with their self-reported answers, the study concluded.

"The experience of this pandemic has been especially stressful for health care workers, and as a community we need to be able to support them, especially as the virus persists," said the study's co-author Zahi Fayad, Ph.D., Director of the BioMedical Engineering and Imaging Institute, Co-Founder of the MSCIC, and the Lucy G. Moses Professor of Medical Imaging and Bioengineering at Icahn Mount Sinai. "Our study is one of the first to document not only the toll the pandemic has taken on our health care workers, but also the importance of resilience and social support as specific paths toward efficiently and effectively directing support."

The latest findings from the Warrior Watch Study build on previous research that used wearable devices to identify COVID-19 cases earlier than traditional diagnostic methods. Researchers monitored the participant's physical activity and tracked subtle changes in their heart rate variability measured by an Apple Watch, which signaled the onset of COVID-19 up to seven days before the individual was diagnosed with the infection via nasal swab.

More information: Robert P Hirten et al, Factors Associated With Longitudinal Psychological and Physiological Stress in Health Care Workers During the COVID-19 Pandemic: Observational Study Using Apple Watch Data, *Journal of Medical Internet Research* (2021). DOI: 10.2196/31295

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