Sharing stress data could enable new forms of mental health support, research suggests

April 13 2023

Stress data collected by wearable tech and shared between close friends could help enable new forms of mutual care for mental health, research suggests.

Computing scientists from Scotland and China are behind the finding, which is set to be presented at the [ACM Conference on Human Factors in Computing Systems](#) in Germany later this month.

The team set out to explore whether sharing automatically-tracked information about stress among a small group of trusted people could help them to understand each other's changing moods and offer appropriate support.

Previous studies on sharing details about fertility and [blood glucose](#) have shown positive results for this social approach, known as "caring-through-data."

To explore this approach for stress data, the team developed a [smartphone app](#) called IntimaSea which captures heart rate variability data from users' smart watches and displays it in a graphical interface showing waves lapping on an island shore. Users can control whether to share their stress data with a simple click.

Each user picks a different marine animal as their user avatar. When users' stress increases—measured by a fall in their [heart rate variability](#)—their avatar sinks further below the waves, allowing other users to see that they might need some support.

In response, users can offer help in the form of supportive text messages, emojis, photos, drawings, links to external content or calling up directly. They can assess the impact of their support by tracking the depth of other users' avatars on their mobile device's screen.

The researchers conducted two trials of IntimaSea—an initial two-week feasibility trial among the researchers themselves followed by a four-week test with volunteers recruited from the public. A total of 19 people split across nine groups of two to three people each participated in the trials. The groups included romantic partners, close friends, and cousins.

The data collected by the researchers, combined with interviews with participants after the study concluded, suggested that the app had a positive impact on users' awareness of stress—not just the stress levels of other users but their also own.

The app's simple graphical display helped users get a better sense of the group's stress levels, and to make timely interventions to help when they saw dips in mood. They were more likely to make immediate contact when they could see that dips were occurring in real-time.

Overall, users felt that IntimaSea offered them valuable new insights into the well-being of others, and a sense of collective responsibility to maintain the group's collective mental health.

Dr. Xianghua (Sharon) Ding, of the University of Glasgow's School of Computing Science, led the research of IntimaSea. Dr. Ding said, "Not everyone finds it easy to talk about their stress levels and their mental health, even with the people who are closest to them.

"IntimaSea was designed to take away some of that challenge by letting small groups keep tabs on each other and reach out with small displays of support. The study suggests that was a success—it helped remove

some of the challenge of expressing feelings for those users who sometimes struggled to do so, and offered new opportunities for people to communicate, either on the app or by starting conversations in real life.

"Now that we've demonstrated the potential of shared stress tracking for mental health support, we're keen to build on these early findings. As a standalone app, IntimaSea requires users to actively decide to install it on their devices before they can engage with it.

"If its functionality could be built into the operating system of the device, or integrated into an already widely-used app like WeChat or WhatsApp, it would be much more likely to reach the kind of critical mass of users who would benefit from using it. We hope that in future studies we can expand the scope of this initial study and further demonstrate the potential of this kind of caring-through-data approach to mental health."

More information: IntimaSea: Exploring Shared Stress Display in Close Relationships, Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems. eprints.gla.ac.uk/291878/

Provided by University of Glasgow