Study: Increased use of videoconferencing apps during pandemic led to more fatigue among workers

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Researchers at Nanyang Technological University, Singapore (NTU Singapore) have found that the increased use of videoconferencing platforms during the COVID-19 pandemic contributed to a higher level of fatigue, as reported by workers.

Following work-from-home orders issued by governments worldwide during the pandemic, many employees attended meetings virtually using technologies such as Zoom or Microsoft Teams, instead of meeting face-to-face.

In a survey conducted in December 2020, the NTU research team found that 46.2% of all respondents reported feelings of fatigue or being overwhelmed, tired, or drained from the use of videoconferencing applications.

The researchers derived the results through an analysis of a survey of 1,145 Singapore residents in full-time employment and who had indicated that they use videoconferencing apps frequently.

The researchers from the NTU Wee Kim Wee School of Communication and Information (WKWSCI) and its Center for Information Integrity and the Internet (IN-cube), published their findings in the journal *Computers in Human Behavior Reports* in June 2022.

Assistant Professor Benjamin Li, from NTU's WKWSCI, who led the study, said: "We were motivated to conduct our study after hearing of increasing reports of fatigue from the use of videoconferencing applications during the pandemic. We found that there was a clear relation between the increased use of videoconferencing and fatigue in Singaporean workers. Our findings are even more relevant in today's context, as the use of videoconferencing tools is here to stay, due to flexible work arrangements being a continuing trend." He is also a member of IN-cube.

Respondents for the survey were at least 21 years old, and the demographics of the participants reflected the make-up of Singapore's multi-racial society.

The respondents reported on average that they spent about three days working from home and spent about nine hours working each weekday.

Co-author Assistant Professor Edmund Lee, also from NTU's WKWSCI and Assistant Director of IN-cube, said: "As more organizations move toward embracing a hybrid work model where videoconferencing plays a significant role in how people meet and work, employers should be mindful of both the benefits and drawbacks of such technology in the workplace. While videoconferencing tools are easy to navigate and useful in scheduling meetings, the downside is that

people may end up packing their day with back-to-back meetings, leading to exhaustion at the end of the workday."

A useful tool that has its drawbacks

The team of researchers said that their goal is to highlight how current implementations of such technologies can be exhausting to employees and how companies can improve and optimize their use by their workforce.

Videoconferencing dramatically increases the amount of eye contact in an average meeting, invoking stress and social anxiety in workers. Allowing speakers, or meeting participants to see themselves during video chats constantly also creates fatigue, say the team, as it encourages 'mirror anxiety' which refers to a feeling of self-consciousness triggered by the self-view in video conferences that acts as an omnipresent mirror during social interactions.

Asst Prof Li added: "We hope that our results will spur further research to understand the extent to which the environment for human communication can function as a social determinant of health. We hope that it will encourage different stakeholders, such as policy makers, technology developers, community leaders, corporate leaders, and users, to come together to practically address the problems of videoconferencing fatigue."

Co-author Associate Professor Edson Tandoc, from NTU's WKWSCI and the Director of IN-cube, said: "The onus is on employers to continue exploring what may help to cushion the fatiguing impact of frequent use of videoconferencing tools, as many employees continue to rely on these tools to carry out their daily work routines."

Link between internet connectivity and videoconferencing fatigue

The study, which was also co-authored by IN-cube research fellow Dr. Goh Zhang Hao, further explored the contribution that the quality of internet connectivity makes towards videoconferencing fatigue. Specifically, when videoconferencing use was low, a reliable internet connection was linked to low videoconferencing fatigue. However, at higher levels of videoconferencing usage, a reliable internet connection did not mitigate reported levels of videoconferencing fatigue say the researchers.

The researchers found that frequency of videoconferencing use increases their feelings of videoconferencing fatigue by about 50%. This relationship between the two factors is exacerbated by one's increase in their satisfaction with the internet, in terms of reliability, coverage, speed, and cost.

Together with users' satisfaction of the internet, the frequency of use of videoconferencing increases users' fatigue levels by 10%.

Explaining this finding, Asst Prof Li added: "We have all experienced frustration when our online media experiences such as when we are watching YouTube or Netflix get disrupted because of a poor internet connection. The video lags and the picture quality worsens, resulting in a disappointing viewing experience. It may be the same with videoconferences, perhaps more so as important information could be lost when the connection is choppy, leading to more frustration and fatigue.

"So, a reliable internet connection appears to make us less frustrated when there are only a few videoconferences to attend to. What the results suggest is that when users are overwhelmed with many videoconferences, even the quality of the internet connection does not help."

In future research, the team of researchers will be exploring how a person's living and working environment might impact on videoconferencing fatigue and other mental well-being measures.

They also hope to repeat the study and examine whether there are any differences between videoconferencing fatigue reported by males and females. Upcoming research by in-CUBE is also seeking to explore the consequences of fatigue from videoconferencing on family units.

More information: Benjamin J. Li et al, From frequency to fatigue: Exploring the influence of videoconference use on videoconference fatigue in

Singapore, *Computers in Human Behavior Reports* (2022). DOI: 10.1016/j.chbr.2022.100214

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