Authors' Response to ''Work From Home (WFH) During COVID-19: Is Virtual Reality (VR) a New Solution to New Problems?''

Reply:

We read with great interest the comments regarding possibilities for the use of virtual reality (VR) that were submitted in response to our manuscript detailing the health and well-being impacts of working from home during COVID-19.[1] We agree that we are at a pivotal point in determining what the future holds for remote work and work from home (WFH). Many organizations are currently examining the costs and benefits associated with maintaining physical facilities as opposed to reducing overhead by maintaining or encouraging remote work.[2] Simultaneously, we are entering an era in which supporting worker well-being is moving beyond the experience of work and the workplace to incorporate aspects of an individual worker's home life and lived experiences.[3,4] We believe that organizations will need to ensure that the development of WFH policies and practices go beyond examination of the corporate bottom line.

With this in mind, the analysis of additional data included in our survey suggests that individuals who transitioned to WFH during COVID-19 generally did not experience any change in overall levels of productivity.[5] However, this perception of sustained levels of productivity was not without numerous shifts in how work was organized, when work was completed, and the way in which work was conducted, for example, spending approximately 1.5 hours per day longer sitting at a computer workstation and working well into the evenings and on weekends as compared to previous work.[5] Similar to impacts on health and well-being, decreased productivity when WFH during COVID-19 has been associated with distractions in the home caused by other family members and social isolation or decreased interactions with co-workers.[5,6] Given the breadth and depth of emerging evidence, future decisions regarding WFH must consider the co-equal impact on work productivity and employee health and well-being while ensuring equitable access to resources across employees with variable home contexts.

As part of the WFH conversation, we are excited to see reference to the idea that separate ''spaces'' between home and work should be considered as part of the development of supportive working environments within employees' diverse homes. As humans, we often place physical, mental, and behavioral boundaries between home and work while simultaneously developing identities, a sense of self, and unique ways of existing within each of these different spaces.[7] We are pleased to note that this theoretical foundation of the importance of ''space'' was one of the primary themes that emerged in our qualitative analysis of more than 600 responses to open-ended questions on our survey.[8] References to the benefits of increased time and flexibility in scheduling due to a lack of commuting time were among the most frequent comments we received. However, these benefits were balanced against the lack of transition between home and work, as well as the sharing of the space, which led to significant challenges in setting appropriate boundaries and impacted overall well-being.[8]

Evidence supporting the theory described is reflected in many different statements provided by the respondents, none capturing the overall concept better than: ''*The lack of delimitation between home and work and the lack of a commute to unwind are difficult*.'' For some of the respondents, the shared space no longer allowed for easy separation of work and home activities. ''*Having a workstation at home makes it difficult to feel as if the workday is ever over*,'' a sentiment echoed by another respondent, ''*It is difficult to 'disconnect' at the end of the workday...it is easy to leave the computer open and occasionally walk by to check on after-hour emails*.'' Other respondents mentioned how a shared space limited the separation of work and home in ways that impacted well-being. One respondent indicated, *''Previously I could leave work-related issues at work, but now all work-related problems are constantly at home which has made my stress levels so much higher,''* while a different individual noted that it was *''exhausting and isolating to work and live in the same environment.''* Finally, respondents noted that not having daily changes in the space of home and work altered temporal experiences. One quote indicated that ''*there is little to distinguish weekdays from weekends*'' and another noted, *''I don't like it, the feeling of waking, working, recreating, and sleeping all in one space; it makes the days blur together and my motivation drops off a cliff.''*

We are in agreement that VR and other technologies, such as artificial intelligence and augmented reality, may be exceptionally useful to address these space-related challenges and support positive WFH experiences. The suggestions for future research in this area are well stated. We would like to add that not only could VR allow a worker to feel immersed in a different work environment while still being in their home, but effective use of VR could provide opportunities to tailor the environment to meet individual worker preferences and needs. As such, we propose to add concepts of diversity, access, and inclusion to the list of questions for future research in the use of VR to create healthy and productive workspaces. For example, autistic workers commonly report that sensory-related environmental concerns (eg, noise, light) are barriers in the workplace.[9–11] For individuals who are able to successfully engage and are comfortable with the tools required (eg, wearing googles), a virtual environment that is better suited to an individual's needs and preferences could be provided through VR. In fact, virtual work environments could be tailored to meet the individual preferences for any worker, even those in a traditional office setting who are not satisfied with the physical office environment. For example, as was noted by one of our survey respondents, *''the space to work [at home] is more comfortable. . .my office had no windows and was an interior room, quite small.''*

In closing, we encourage researchers to continue exploring these types of technologies as a component of an integrative approach to support worker health and well-being within future workplaces.[4] While doing so, however, it is important for such scholars to consider the diversity of individual worker preferences, appropriate methods to support worker productivity and performance, and ensure worker privacy is maintained.[12] When approached correctly and combined with supportive policies and programs, we are confident that use of technologies such as VR within future

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workplaces will create environments where all types of workers can flourish.

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