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Reply to Comment on: The Impact of COVID-19 on Individuals Across the Spectrum of Visual Impairment



WE THANK TING AND ASSOCIATES FOR THEIR THOUGHTFUL comments and congratulate them on their survey-based study on visual impairment (VI) and the psychosocial impact of COVID-19.¹ Our studies^{1,2} were performed in different continents, during different time periods (May 2020 vs. July to August 2020), and on populations dissimilar in ethnic makeup, education level, typical family structure (nuclear vs. extended families residing together), degree of caregiver support, and more. However, both analyses revealed important parallel findings, and together provide further evidence that VI may have a substantial impact on individuals' experience with COVID-19.

In particular, COVID-19's repercussions on those with moderate or worse VI were found to be substantial in both studies. In our study at the Aravind Eye Hospital, Pondicherry, India, concerns about contracting COVID-19, access to health care, and the feeling that vision would lead to poor COVID-19 outcomes were reported more frequently among groups with substantial VI.² Likewise, Ting and associates' study in the United Kingdom revealed that moderate and severe VI were associated with increased loneliness and an impact on mental health.¹ We partly agree with Ting and associates' comment that tele-ophthalmology plays a promising potential role in patient care. Our study's results suggest there is a need for further exploration of this idea, though there are likely to be logistical challenges in groups with the greatest need (those with moderate or severe VI).² Our groups' findings highlight the need for further assessments of populations with VI as well as other disabilities to inform policy in this unprecedented era.

As expected, our study designs varied in notable ways. Ours was a telephone-based survey, whereas Ting and associates utilized an online survey. The latter may have inadvertently excluded individuals who were not able to perform visually-demanding tasks, whereas the former may have excluded those with severe hearing impairment, which is known to be comorbid with VI.^{3,4} Additionally, it appears that level of VI and eye conditions were self-reported by participants in Ting and associates' survey in the following questions: "What is the extent of your sight loss?" and "What eye condition(s) do you have?"¹ In contrast, our

study included only participants who were previously examined in our eye clinic, allowing us to verify participants' levels of VI and ophthalmic diagnoses. With these data, we were able to draw conclusions between participants' ophthalmic diagnoses and experience with COVID-19. For instance, we found that individuals with diagnoses leading to irreversible vision loss reported greater challenges including more financial burden and lack of access to eye care and transportation in the setting of the COVID-19 shutdown.² In agreement with Ting and associates' findings, these vulnerable patients may be in need of additional assistance during this time period and beyond. Finally, we appreciate the commenters' suggestion to use multivariate analysis to account for the possible effect of age on our outcomes, as this may have improved our study.

Once again, we thank Ting and associates for raising these important considerations and highlighting the serious concerns of visually-impaired individuals in the setting of COVID-19.

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REFERENCES

1. Ting D.S.J., Krause S., Said D.G., Dua H.S. Psychosocial impact of COVID-19 pandemic lockdown on people living with eye diseases in the UK. *Eye (Lond)*. doi: 10.1038/s41433-020-01130-4. 2020.08.10.
2. Shalaby WS, Odayappan A, Venkatesh R, et al. The impact of COVID-19 on individuals across the spectrum of visual impairment. *Am J Ophthalmol*. 2021;227:53–65.
3. Mudie LI, Varadaraj V, Gajwani P, et al. Dual sensory impairment: The association between glaucomatous vision loss and hearing impairment and function. *PLoS One*. 2018;13(7).
4. Swenor BK, Ramulu PY, Willis JR, Friedman D, Lin FR. The prevalence of concurrent hearing and vision impairment in the United States. *JAMA Intern Med*. 2013;173(4):312–313.

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