Enhancing medical professionals' and students' empathy for visually impaired patients using virtual reality

Physician empathy—a cognitive attribute that involves understanding the patients' experience, concerns, and needs to effectively communicate with the intention to help[1]—has been associated with improved patient outcomes.[2] Yet, there remains a deficit in the available tools and interventions for increasing empathy for the visually impaired.

It has been suggested that virtual reality (VR) can be used to promote empathy in practitioners related to those with chronic vision loss (CVL). The immersive nature of the experience could facilitate an understanding of the patient's journey with CVL. Indeed, this technology has been used to teach health care trainees empathy when caring for older adults.[3] Therefore, we conducted this study to evaluate the effects of a VR experience on empathy in health care professionals and trainees who care for patients with CVL.

Methods

The VR experience was composed of a series of 3 visual challenges aimed at simulating central, peripheral, and diffuse patterns of vision loss. These represented macular degeneration, glaucoma, and cataracts, respectively (Fig. 1). After the VR experience, participants completed a cross-sectional survey aimed at measuring empathy. This was adapted from a questionnaire developed by Shapiro and Hunt.[4]

Results

We approached 116 potential participants to take part; 98 of these individuals completed the survey. The mean age was 34 years (standard deviation 11) and 54% identified as female. The highest proportion of participants was medical trainees (35%), followed by hospital staff (34%), then nurses or doctors (31%). More than half of the participants (59%) had not previously used VR.

Each question was scored on a scale from 1 (*strongly disagree*) to 7 (*strongly agree*). Participants indicated that the VR experience was a useful way of learning about progressive vision loss (PVL; mean score 6.3), improved their understanding of the experience of persons living with PVL (6.2), increased their empathy for persons with vision loss (6.2), caused them to think about issues of PVL in new ways (mean score 5.9), and provided better insight into the emotional and psychological issues of PVL (5.6; Fig. 2).

There were no clear visual differences between the participants' work type and their answers (Fig. 2). At the end of the experience, 88% of participants indicated that they would incorporate the experience into their future practice.

Fig. 1—Peripheral vision loss challenge (A) pre and (B) post. Diffuse vision loss challenge (C) pre and (D) post.

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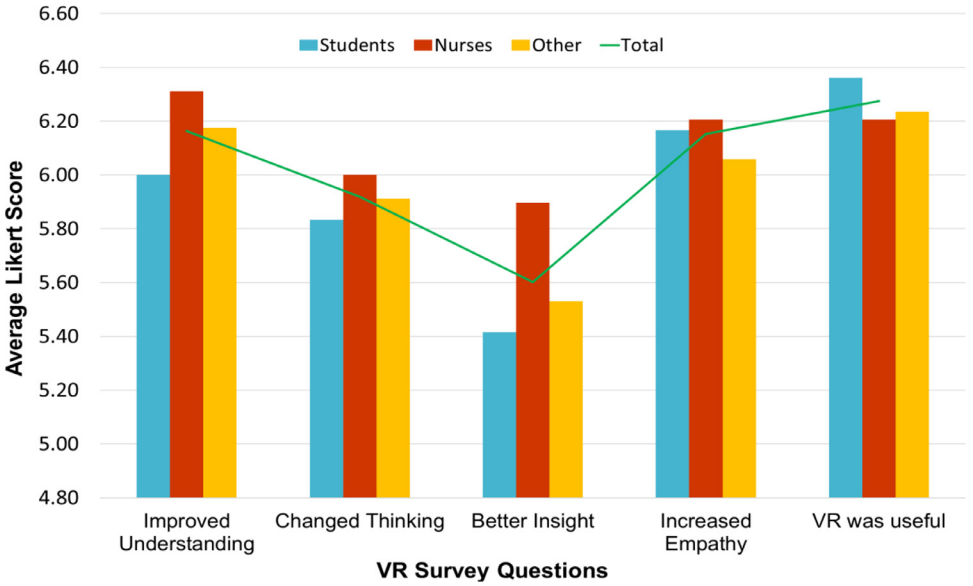

Fig. 2—Average Likert scale scores per question compared by group and total responses. VR, virtual reality.

Discussion

The present study demonstrated that a VR-based experience improved participants' understanding of CVL, enabled them to think about it in a different way, provided a better insight into psychological and emotional issues involved, and increased their overall sense of empathy. Participants also indicated that the VR experience was a useful means to learn about CVL.

Our findings are consistent with those of Dyer et al.,[3] who used VR to simulate the experience of the common health problems of older adults. They reported an increase in both understanding and empathy for age-related health problems including macular degeneration. Ahn et al.[5] also reported a 2-fold increase in volunteer time to help counsel a group of students on colour blindness when a red-green colour-blind VR simulation was used.

Conclusion

VR might be an effective tool in teaching empathy to health care professionals and trainees who are working with visually impaired patients. This intervention has the potential to improve patient quality of care and outcomes.

Supplementary Materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.jcjo.2020.12.023.

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References

1. Hojat M, Louis DZ, Markham FW, Wender R, Rabinowitz C, Gonnella JS. Physicians' empathy and clinical outcomes for diabetic patients. Acad Med 2011;86:359–64.
2. Kim SS, Kaplowitz S, Johnston M V. The effects of physician empathy on patient satisfaction and compliance. Eval Health Prof 2004;27:237–51.
3. Dyer E, Swartzlander BJ, Gugliucci MR. Using virtual reality in medical education to teach empathy. J Med Libr Assoc 2018;106:498–500.
4. Shapiro J, Hunt L. All the world's a stage: the use of theatrical performance in medical education. Med Educ 2003;37:922–7.
5. Ahn SJ, Le AMT, Bailenson J. The effect of embodied experiences on self-other merging, attitude, and helping behavior. Media Psychol 2013;16:7–38.

Footnotes and Disclosure

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