



Contents lists available at ScienceDirect

Pediatric Neurology

journal homepage: www.elsevier.com/locate/pnu

Research Letter

Virtual Education During COVID-19 and Beyond

Rose Gelineau-Morel, MD^{*}, Jennifer Dilts, DO

Division of Neurology, Department of Pediatrics, Children's Mercy Hospital, Kansas City, Missouri



ARTICLE INFO

Article history:

Received 2 December 2020

Accepted 25 February 2021

Available online 9 March 2021

Keywords:

Virtual curriculum

Virtual education

Remote learning

COVID-19

Problem

The Children's Mercy Kansas City Neurology Division has 113 division members (23 faculty, 16 advanced practice nurses (APRNs), five residents/fellows, 27 nurses, and 42 other learners) across five locations, which creates obstacles for engaging learners in educational conferences. Although previously some conferences were live-streamed, lectures were not recorded, and most were attended solely by trainees and a few select faculty. However, coronavirus disease 2019 (COVID-19) and social distancing prompted rapid development and implementation of a complete virtual curriculum.

Approach

We created a neurology education group using Microsoft Teams, including all clinical and nonclinical members in our division. Within one week of beginning social distancing, we offered an average of four live virtual lectures per week, increased from two weekly lectures before COVID-19. Leaders promoted participation of all neurology division members, and decreased clinical load (secondary to COVID-19 restrictions) facilitated time for lecture

Conflict of interest: The authors declare no conflict of interest or financial disclosures concerning the materials or methods used in this study or the findings specified in this article.

^{*} Communications should be addressed to: Dr. Gelineau-Morel; Division of Neurology; Department of Pediatrics; Children's Mercy Hospital; 2240 Kenwood Avenue; Kansas City, MO 64108-1619.

E-mail address: rngelineaumorel@cmh.edu (R. Gelineau-Morel).

<https://doi.org/10.1016/j.pediatrneurol.2021.02.008>
0887-8994/© 2021 Elsevier Inc. All rights reserved.

preparation and attendance. Lectures covered diverse topics, including quality improvement and leadership development, in addition to clinical neurology. We tracked attendance and recorded and stored all lectures and supplementary materials in Microsoft Teams. We emailed a REDCap survey^{1,2} at the end of the third and fourth weeks of virtual education, and again after three months, with personalized reminders to complete the survey every two days for one week. Questions addressed participation and contribution to education, as well as perceived benefits and drawbacks of the curriculum.

Outcomes

Our survey response rate was 92% (104 of 113) for the week 3 survey, 84% (95 of 113) for the week 4 survey, and 55% (62 of 113) for the three-month survey. Survey results showed that before COVID-19, 28% respondents attended at least one neurology lecture per week. Three weeks after initiating our virtual curriculum, 74% reported they were attending at least one lecture per week, increasing to 88% after three months. Attendance was well-distributed amongst all types of learners (26% faculty, 29% nurses, 21% APRNs, 8% residents and fellows, 17% other learners), with attendance records averaging 22 participants per lecture (S.D. 9.2).

The virtual format promoted educational engagement, with survey results showing that 37% of all respondents and 60% of faculty gave a lecture or uploaded educational content to Microsoft Teams in the first three months. Lecturers included faculty, APRNs, trainees, social workers, a research coordinator, a chaplain, and our neurology pharmacist.

On our week 3 survey, learners ranked their satisfaction with our pre-COVID-19 educational curriculum, reporting a mean satisfaction level of 5.7 out of 10, with 1 being “not at all satisfied” and 10 being “extremely satisfied” (S.D. 2.3). Satisfaction increased to 7.9 (S.D. 1.4) three weeks after implementing the virtual curriculum, 8.2 (S.D. 1.4) at four weeks, and 8.5 (S.D. 1.25) at three months (two-tailed paired *t* test $P < 0.001$ when compared with pre-COVID satisfaction levels). In free text responses, learners appreciated easy access to educational materials, including ability to view recorded lectures at convenient times. At three months, 88% respondents wished to continue virtual education, and 60% of clinical staff planned to change their work practice based on information they learned. Sixty-seven percent of trainees “agreed” or “strongly agreed” that the virtual curriculum improved how prepared they felt for upcoming examinations. Rapport across the division increased, with 85% of respondents in the three-month survey stating that they “agreed” or “strongly agreed” that they felt more connected to colleagues.

Discussion

COVID-19 proved to be a “disruptive innovation,”³ catalyzing the rapid formation of a virtual neurology curriculum. Our survey

results show our curriculum increased learner satisfaction, engagement, and rapport, compared with our pre-COVID curriculum. Other neurology virtual curricula have targeted physicians,⁴ whereas our curriculum promotes the exchange of ideas between all types of learners, fostering engagement and rapport. We plan to continue our virtual education curriculum in the future, further expanding our topics and lecturers to target our diverse audience.

References

1. Harris PA, Taylor R, Thielke R, et al. Research electronic data capture (REDCap)—a metadata-driven methodology and workflow process for providing translational research informatics support. *J Biomed Inform.* 2009;42:377–381.
2. Harris PA, Taylor R, Minor BL, et al. The REDCap consortium: building an international community of software platform partners. *J Biomed Inform.* 2019;95:103208.
3. Mehta NB, Hull AL, Young JB, Stoller JK. Just imagine. *Acad Med.* 2013;88:1418–1423.
4. Weber DJ, Albert DVF, Aravamuthan BR, Bernson-Leung ME, Bhatti D, Milligan TA. Training in neurology: rapid implementation of cross-institutional neurology resident education in the time of COVID-19. *Neurology.* 2020;95:883–886.