Original Research

PEDIATRIC RESIDENT MEDICAL EDUCATION DURING COVID-19: RESIDENT AND FACULTY PERSPECTIVES AT A SINGLE INSTITUTION

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Abstract: COVID-19 altered medical education formats due to social distancing requirements. In our program, residents rated distance learning at least as effective as traditional teaching models, faculty reported high satisfaction with resident education, and both groups reported that residents were engaged during distance learning. The majority of residents and faculty recommended a hybrid model for future resident education.

Keywords: resident education, curriculum, pandemic, COVID

BACKGROUND The Coronavirus Disease 2019 (COVID-19) pandemic has altered medical education formats and practices. Starting in March 2020, social distancing recommendations and policies led to limitations on gatherings and led training programs away from traditional in-person lectures. During this time, programs made various changes to embrace technology and distance learning in order to limit disruptions in education. We present the pediatric resident and faculty perspectives on the distance learning models utilized and determined their recommendations for ideal learning formats post-pandemic.

METHODS At our institution, the traditional in-person pediatric resident noon conference lectures, grand rounds and other educational sessions were held remotely using ZOOM technology. An anonymous survey was e-mailed to 35 faculty members and 24 pediatric residents at Staten Island University Hospital, Northwell Health.

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The faculty were surveyed as to the teaching modalities used prior to COVID-19 and those used during the pandemic. The faculty were asked how they rated several question on a 5-point Likert scale: the level of resident engagement (1=never, 5 =always), ease of teaching (1=very difficult, 5=very easy) and satisfaction with resident education (1=very dissatisfied, 5=very satisfied) during the pandemic. The residents were asked to rate their level of engagement (1=never, 5=always) during educational sessions through the pandemic and effectiveness of resident education compared to prior to the pandemic (1=much worse, 5=much better). Both faculty and residents were also asked their preferences for future educational models (reverting back to all in-person education, a hybrid model of remote and in-person education sessions, and a completely remote model).

The results are reported as percentages, mean scores and standard deviations (SD). The scores from the faculty and residents were compared using an independent 2-tailed t-test. Statistical significance was documented with a p value of <0.05. The project did not meet criteria for human subjects' research; review by the Institutional Review Board was not required.

RESULTS Seventeen out of 24 (71%) pediatric residents and 17 out of 35 (49%) faculty members completed the survey. The percentage of faculty members who taught using various modalities prior to COVID-19 and during COVID-19.

Only 1 faculty member (6%) reported teaching remotely prior to COVID-19, but this increased to over 94% of faculty during the pandemic. Similarly, 100% of faculty taught using in-person lectures prior the pandemic, and that decreased to 24% during the pandemic. The use of online resources provided to the residents did not significantly change due to COVID-19. Small group in-person teaching did decrease with the pandemic.

The residents rated the effectiveness of the remote lectures as compared to in-person lectures with a mean score of 3.12 (SD 0.83) out of 5, with approximately 65% of residents indicating that the remote lectures were approximately the same as in-person lectures in terms of effectiveness of teaching and learning. The faculty rated the ease of teaching remotely and satisfaction of resident education during the pandemic with mean scores of 3.71 (SD 0.96) and 3.75 (SD 0.75) out of 5, respectively. The residents and faculty rated the level of resident engagement with education during the pandemic with mean scores of 3.65 (SD 0.59) and 3.06 (SD 0.94), respectively. The residents rated their own level of engagement higher than that perceived by faculty ($p=0.04$). The majority of both pediatric residents and faculty both recommended a hybrid model for future post-pandemic resident education, with 82.4% of residents and 94.1% of faculty recommending a hybrid model. 17.6% of pediatric residents recommended to revert to an all in-person teaching model and none of the residents recommended to continue with a completely remote model. 5.9% of faculty members recommended to continue with an all remote resident teaching model, and none of the faculty recommended to revert to the completely in-person teaching model.

DISCUSSION Reports of electronic learning ("e-learning"), especially in asynchronous form, have increased over the last decade and vary in effectiveness [1-4]. Many potential benefits to e-learning have been documented. Electronic and remote learning offers the opportunity to access educational materials even in resource-limited settings. The COVID-19 pandemic led to changes in traditional educational formats for resident learning, as programs aimed to limit close contact between learners. Due to COVID-19, some residents were kept remotely, others were moved to needed units. The faculty as well saw changes to limit close contact and limited in-person office visits and hospital visits, making remote education an ideal solution to continue educational series.

As predicted, the COVID-19 pandemic led to an increase in the percentage of faculty teaching remotely and a decrease in in-person lectures and small-group sessions. Both faculty and residents reported resident engagement to be above neutral, although residents self-rated their own level of engagement higher than that perceived by faculty. This may mean that faculty have some difficulty obtaining a true measure of resident engagement during remote sessions, but the residents felt engaged in the remote sessions. In addition to being engaged in remote sessions, the residents reported that they felt the remote sessions were at least as effective as the traditional sessions, with a mean rating of 3.12, slightly above neutral; a score of 3 represented that the remote lectures were approximately as effective as traditional in-person lectures. The faculty also rated the ease of teaching remotely and satisfaction with resident education highly.

It is interesting that the majority of both faculty and residents would recommend a hybrid model with both remote and in-person educational sessions after the pandemic. The few residents who didn't choose a hybrid model, chose the completely in-person model, and the 1 faculty member who did not choose a hybrid model chose an all-remote model. The remote model may add to ease of scheduling sessions for faculty amidst a multitude of other clinical and administrative duties. The majority in both groups recommended a hybrid model, suggesting the benefits of e-learning are noted, but the in-person connection that was missing during the pandemic, may have been viewed as a key feature of an ideal educational model. While the residents were engaged in remote learning and found it at least as effective as the traditional model, the remote learning model does have its limitations and would not appear to be the preferred model in the future.

This study was performed in a single department of a single institution with a limited sample size. It only reflects the remote experience provided by a single department. In addition, while 71% of residents completed the survey, less than 50% of the faculty completed the survey. Further study is needed to determine the changes made in other departments and hospitals and to compare the satisfaction with these changes in educational models and recommendations for ideal models moving forward through the pandemic and beyond.

CONCLUSION Due to the COVID-19 pandemic, programs made sudden changes to formats of learning for residents to optimize and continue learning, despite social distancing requirements. In our pediatric program, residents and faculty both reported thatresidents were engaged in the distance learning, faculty reported ease of teaching and

satisfaction with resident education during the pandemic, and residents found this format at least as effective as the traditional models. Ultimately, though, most of both residents and faculty recommended a combination "hybrid" model, suggesting that the benefits of both can be combined to optimize the learning environment for residents.

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