

Research Article

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Learning from Virtual High-Fidelity Simulation During the COVID-19 Era in the Pediatric Clerkship

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ABSTRACT

Objective: In-person high-fidelity simulation was converted to virtual sessions amid COVID-19 era in mid-March of 2020. The effectiveness of virtual high-fidelity simulation, and the impact on the students' learning, secondary to differences between in-person and virtual high-fidelity simulation was evaluated by questionnaire.

Methods: In-person high fidelity simulation was converted to virtual sessions using Zoom platform. At the end of each session, students were requested to complete a questionnaire via One45 software.

Results: Twenty-six students participated in a total of 7 virtual high-fidelity simulation sessions and twenty-three students completed the questionnaire. Most of the students felt no negative impact on their performance or learning with virtual simulation. However, the inability to physically examine the mannequin and the lack of in-person collaboration between the team members caused negative impact.

Conclusions: Virtual high-fidelity simulation is a compatible educational tool when compared with in-person session. We shared our experience and what we have learned from running high-fidelity simulation on a virtual platform.

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What's New

Use of virtual high-fidelity simulation was explored in Pediatric Clerkship and was found to be a compatible educational tool. We would like to share our experience and what we have learned from running high-fidelity simulation on a virtual platform.

Introduction

In mid-March of 2020, the Association of American Medical Colleges (AAMC) issued an important guidance supporting medical schools pausing all student clinical rotations secondary to concerns regarding COVID-19 and availability of personal protective equipment (1). In order to maintain some degree of clinical exposure in the Pediatric Clerkship, the simulation team converted the in-person high-fidelity simulation to virtual high-fidelity simulation. We would like to share our experience and what we have learned from running high-fidelity simulation on a virtual platform.

Method

Zoom software (Zoom Video Communications, Inc, San Jose, California) was selected due to its diverse functions and its pre-existing license with our institute. The students, faculty, and the simulation team participated from the privacy of their home under the shelter-in-place order. The Muse operating system for simulators (CAE, Inc, Sarasota, Florida) was downloaded onto a laptop, and the pediatric prewritten cases that were used for in-person simulations were transferred into it. Following a few dry runs with faculty, the virtual platform was deemed to be effective. On the days of simulation, the students were moved into the "examination room" (i.e. Zoom room) where the simulation team and faculty were prepositioned for the pre-briefing before the start of the scenario. The students were given individual roles including a scenario leader and the designated persons to obtain history, perform the initial assessment, and communicate orders. They were asked to disable the video function in order to avoid distraction during the cases. The "doorway" information was provided via share screen followed by the patient's monitor showing all the vital signs in real-time. The history of the scenario was provided by the "nurse" and / or "patient" (the simulation team) depending

on the patients' age as to simulate what would occur in a real clinical situation. In view of the inability to physically examine a mannequin, the normal findings were verbalized while abnormal findings were displayed via share screen (i.e. for skin rashes) or share audio (i.e. for wheezes). Their management and orders were input into the "chat box" function of Zoom. At the end of each scenario, the simulation team moved into a breakout room and debriefing by faculty occurred in the "examination room".

At the end of each session after 3 or 4 clinical scenarios, the whole group had a debriefing to iron out unanticipated problems for future simulations. Students were encouraged to provide feedback. They were also asked to complete an electronic evaluation of the session via One45 (One45 software Inc.). There were 2 major domains of interest: (i) the effectiveness of the virtual high-fidelity simulation, and (ii) impact on the students' learning secondary to differences between in-person and virtual high-fidelity simulation.

Outcomes to Date

Twenty-six students participated in a total of 7 virtual high-fidelity simulation sessions between April 8th and May 13th of 2020. Twenty-three students completed their evaluation.

Twenty-two students responded that the session either exceeded or met their expectation while 1 student thought it somewhat met expectation. All students thought the session was either very useful or useful for their education. Twenty-one students thought the pre-briefing at the beginning of the session provided either very realistic or realistic overview of the nuances and expectations of the course in its new adaption to a virtual design while 2 students thought it provided somewhat realistic overview.

With reference to the impact on learning by the difference between in-person and virtual high-fidelity simulation, 4 students did not have prior in-person experience and hence were excluded from this subset analysis. The questions asked in this regard are listed in Table 1 and the students' response in Figure 2. Scores were based on a 5-point Likert scale. Absence of mannequin appeared to have no impact on the students' performance or learning (mean score of 3.3). Similarly, the lack of in-person interactions with the nurse, working in a non-clinical setting, and the lack of in-person interactions with the faculty during debriefing, appeared to have no impact on most of the students (mean score 3.1, 2.9, 2.9 respectively). On the other hand, nearly half of the students (n=8) felt that their inability to physically examine the mannequin had somewhat impacted their performance or learning negatively while 11 students did not respond with negative impact (mean score 3.0). The worst negative impact was because of the lack of in-person collaboration between the team members with 8 students claiming somewhat negative impact while 3 students claiming very negative impact (mean score 2.7). Overall, most of the students did not feel that the quality of teaching had been compromised due to its delivery via a virtual platform (mean score 3.2).

Next Steps

The use of virtual high-fidelity simulation sessions had not been used during the Pediatric Clerkship prior to COVID-19 at our institution. As a direct reflection of this experience, we are now not only experienced with this method of teaching, but now have also been tasked with the role of finding and developing innovative ways to implement what the virtual platform lacked based on the feedback the students provided. A potential avenue for this might be to create a pre and post survey for the future cohort of students in order to get a different perspective, as the data we presented was

gathered after the simulation experience. This might also give us a clearer idea of their expectations prior to the sessions and thus make us more aware of their learning needs on the front end. In addition, having the students enable their video function during the simulation exercise may provide a semblance of face to face interaction and collaboration between team members as that was a component that was lacking according to the feedback we received from students. Another area of exploration might entail ways to incorporate additional aspects of the physical examinations into the cases via varied audio functions and to see if this might enhance the experience and make it more similar to in-person simulation sessions. We are still at the early stage of this virtual learning sector but are looking forward to continuing to answer the call to provide innovative ways to enhance the pediatric clinical experience for our students.

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Reference

1. Important guidance for medical students on clinical rotations during the Coronavirus (COVID- 19) outbreak. Press release Association of American Medical Colleges March 17, 2020.

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