Social distancing simulation during the COVID-19 health crisis

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INTRODUCTION

Since the initial recognition of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) that causes the potentially life-threatening respiratory illness known as COVID-19, many aspects of everyday life and the healthcare ecosystem have been confronted with unprecedented challenges. Hospitals throughout the nation, and the world, have been confronted with the need to rapidly refresh and reinforce healthcare workers' (HCWs) routine procedural skills (eg. hand hygiene, personal protective equipment (PPE), and airway management) as well as develop new algorithms for the triage, isolation, and on-going treatment of infected and potentially-infected patients. Our organisation, like many, has prioritised not only the health of our patients but also the health of their families and our staff in order to restrict the number of infected individuals. Faced with mounting requests for simulation-based training and the rapidly expanding guidelines published by the Centers for Disease Control and Prevention (CDC),[1] our organisation chose to employ virtual meetings and virtual simulation strategies to evaluate multiple hospital algorithms, including the assessment and admission of a pregnant woman with suspected or confirmed COVID-19. This scenario was identified by our institution as a high priority, necessary to identify and contain the spread of infection at the most critical point, presentation to the hospital. Virtual simulation and debriefing have emerged as a key component of our strategy to evaluate hospital procedures and train HCWs while adhering to appropriate social distancing guidelines.

METHODS

The objectives of our virtual simulation and debriefing were to ensure proper recognition of risk factors for COVID-19 infection; demonstrate appropriate triage, isolation, and PPE use for providers caring for patients with suspected or confirmed COVID-19 infection; and maintain or exceed appropriate CDC social distancing guidelines. Our simulation participants included a trained simulation director, a simulation education specialist, an audiovisual (AV) specialist, a simulated patient, and the standard hospital staff and HCWs that every patient would encounter during triage. Throughout the simulation, the AV specialist captured and recorded the simulation using a mobile workstation-on-wheels (WOW) running internet-based videoconferencing software. The live-streamed video content was viewed by HCWs and administrators assigned to telecommuting or gathered in a conference room large enough to allow social distancing (six participants in a conference room with an occupant capacity of 24). Those viewing and participating in the virtual debriefing included additional trained simulation specialists, emergency room personnel, and other hospital administrators.

Prior to simulation, a prebriefing was held in the conference room with all socially distanced on-site and remotely viewing participants. Participants were oriented to simulation protocols for maintaining confidentiality and fidelity, the simulated scenario, and the simulation's purpose. We reinforced that this virtual method of simulation was a novel practice and would have new and/or unanticipated challenges not inherent to prior simulation work, but also the potential for similarly new and/or unanticipated advantages. To aid in participants' assessment of the triage algorithm, an evaluation checklist was created to assess for completed, incomplete, and delayed completions of algorithm-specified processes and decision points. The scenario began with the presentation and evaluation of the simulated patient to triage and the elicitation of their presenting symptoms. The scenario proceeded until the healthcare team had triaged and isolated the patient, donned appropriate PPE, assessed the patient's vital signs, elicited the patient's symptoms and complaints, and finally doffed PPE. In order to conserve hospital reserves, alternative forms of simulated PPE were used throughout the simulated scenario. The patient was followed by the in-person participants and their progress viewed remotely via the videoconferencing WOW. At the conclusion of the scenario, a virtual debriefing was conducted with all participants and observers, allowing for a robust discussion and in-depth analysis of the COVID-19 screening algorithm without compromising the safety of the simulation participants.

RESULTS

Both in-person and remotely viewing participants contributed extensively during debriefing. A single in-person participant was designated as the spokesman for remarks contributed via the chat stream. Following the debriefing, additional off-site persons reviewed the footage and submitted comments and concerns to further augment our findings. After compiling real-time and post hoc reviews of the scenario and recorded debriefing, 23 latent safety threats were identified. The primary themes identified as areas for improvement included: (1)

knowledge and performance of staff in mitigating self-exposure, especially the use of PPE and proper sequencing for donning and doffing; (2) communication between triaging staff, the evaluating physician, and hospital staff; and (3) the need to develop specific security and admission department workflows when checking in patients with suspected or confirmed COVID-19.

DISCUSSION

In March 2020, the CDC released heightened guidelines to mitigate the spread of SARS-CoV-2. For organisations that serve people at high risk of serious COVID-19 illness in communities with minimal to moderate spread, the CDC recommends cancelling events for groups of 10 people or higher.[1] Our institution adopted an even more restrictive policy of cancelling all events where more than six participants had gathered. This put a remarkable strain on simulation-based learning and accordingly forced a rapid reassessment and reallocation of resources to combat the developing pandemic response. While others have catalogued numerous challenges to simulation-based learning during this global health crisis,[2] we are excited about numerous unanticipated benefits to virtual simulation. Mobile workstations enabled with internet-based videoconferencing software with high-resolution cameras have allowed for simultaneous live streaming and recording of simulations. Recorded footage can be reviewed multiple times by attendees or allow post hoc viewing for those unable to attend due to new and conflicting COVID-19-related responsibilities. Fewer scheduling constraints and travel restrictions had to be negotiated to rapidly schedule the simulation event. Recorded footage is available for adaptation into future training videos. Finally, we were able to exceed CDC guidelines for social distancing throughout the simulated scenario, allowing us to protect ourselves and our staff in a socially responsible manner. As the global healthcare community continues to wage war on the COVID-19 pandemic, it is essential that we are able to both train and protect our front-line HCWs. Virtual simulations and debriefings have emerged as responsible and successful tools to accomplish this lofty goal.

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