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LETTER TO THE EDITOR

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The role of simulation in preparing the healthcare workforce for providing guideline adapted advanced cardiac life support for COVID-19 patients

COVID-19 has presented new challenges to healthcare systems. A major concern has been the increased risk to healthcare workers of contracting COVID-19, particularly when performing aerosol-generating procedures such as cardiopulmonary resuscitation (CPR).[1,2] This risk is compounded by the potential lapses in adherence to newly developed COVID-19 resuscitation guidelines and using personal protective equipment (PPE). Simulation-based education is a valuable tool in medical education with evidence for its utility in improving confidence, self-reported knowledge and performance.

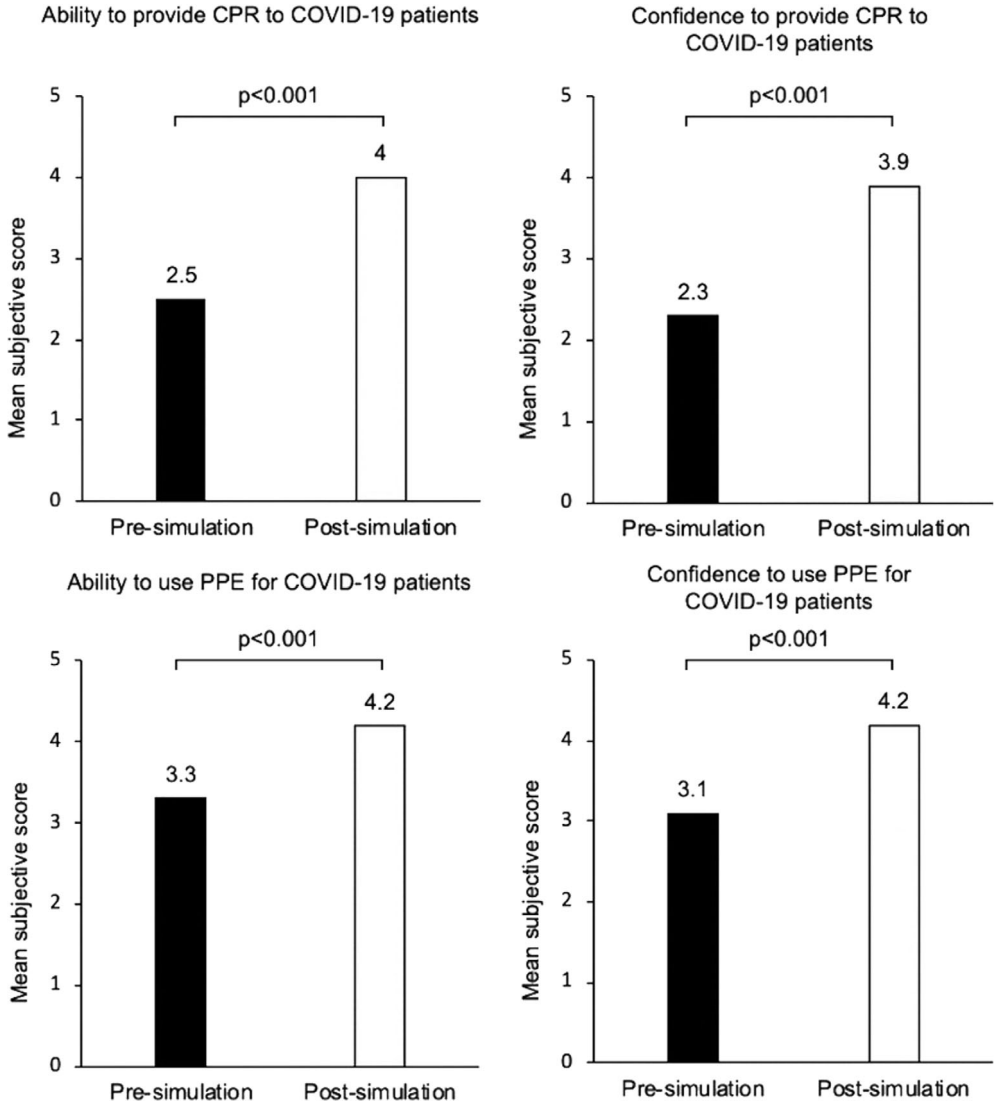

Figure 1 Comparison of mean subjective scores in personal protective equipment (PPE) use and providing cardiopulmonary resuscitation (CPR) to COVID-19 patients in participants pre- and post-simulation.

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Our tertiary metropolitan hospital in Sydney, Australia, employed a standardised 1-h moderate fidelity simulation education programme delivered to 108 healthcare workers (94 doctors and 14 nurses). Ethics approval was granted by our institutional human research ethics committee. Participant-filled surveys were collected pre- and post-simulation to collect data on perceived knowledge, confidence and ability in PPE use and providing CPR. Responses for these questions were collected using a 5-point Likert scale. The mean subjective scores of confidence in providing CPR pre- and post-simulation were 2.3 and 3.9 respectively ($P < 0.001$); perceived ability to provide CPR pre- and post-simulation was 2.5 and 4.0 respectively ($P < 0.001$); confidence in PPE use pre- and post-simulation was 3.1 and 4.2 respectively ($P < 0.001$); and perceived ability in PPE use pre- and post-simulation was 3.3 and 4.2 respectively ($P < 0.001$) (Fig. 1). Adequate knowledge of specific elements of newly developed guidelines improved from 14% to 97% of participants pre- and post-simulation.

Our survey data showed a marked increase in simulation participants' knowledge of the new COVID-19 CPR guidelines, confidence and competence in PPE use and providing CPR. These results are similar to findings where COVID-19-related simulation has improved team competency and reduced time to don PPE.[3] We found that medical simulation was a valuable tool in educating healthcare workers to provide CPR to COVID-19 patients safely. Simulation gives clinicians who are unfamiliar with new guidelines the opportunity to practise the technical skills of providing modified CPR and appropriate use of PPE in a controlled environment. Post-simulation discussion within participant groups revealed valuable insights in maintaining patient and healthcare worker safety. In particular, the importance of non-technical skills, such as situational awareness in the early recognition of a patient's infection status, advanced care planning discussions, navigation of communication difficulties caused by PPE and establishing clean and unclean personnel and equipment, minimised virus transmission across surfaces, equipment and between staff. Identification of such issues during simulation has led to improvements in protocols. In particular, our institution adopted a PPE buddy system whereby providers would supervise PPE donning and doffing in pairs as well as being checked by fellow healthcare workers prior to entering a patient's room.

Our simulation programme demonstrates that during the COVID-19 pandemic, simulation of medical emergency scenarios is a valuable tool in improving knowledge, confidence and perceived ability of healthcare workers in PPE use and providing CPR in medical emergencies. Discussion of experiences during simulation also provides valuable opportunities to identify management issues in order to refine guidelines and improve patient and healthcare worker safety in real-life scenarios.

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