Effect of a standardized patient encounter on first year medical student confidence and satisfaction with telemedicine

Abstract

Context: Although the coronavirus 2019 (COVID-19) pandemic has accelerated the use of telemedicine platforms across the country, medical students may lack confidence in their ability to conduct satisfactory patient encounters and practice clinical medicine through telemedicine.

Objectives: To evaluate the role of a standardized patient encounter on first year medical student confidence and satisfaction in using telemedicine.

Methods: One hundred and sixty two first year medical students recruited from Edward Via College of Osteopathic Medicine-Carolinas campus were surveyed on their confidence and satisfaction with using telemedicine platforms before and after conducting a patient encounter. Participant confidence and satisfaction were assessed with a five point Likert scale: “not confident,” “a little confident,” “somewhat confident,” “confident,” and “extremely confident.”

Results: Of 162 students, 103 (63.6%) completed the preencounter survey and 74 (45.7%) completed the post-encounter survey. Before the standardized patient encounter, 37 participants (35.9%) reported that they were “a little confident” and 20 participants (19.4%) reported that they were “not confident” in their ability to conduct a patient interview using a telemedicine platform. Following the encounter, 24 students (32.4%) reported feeling “somewhat confident”, and 32 (43.2%) reported feeling “confident” in their ability.

Conclusions: Medical students’ confidence and satisfaction with telemedicine improved after a standardized patient telemedicine experience in this study. This experience allowed students to practice the unique skills required for telemedicine. Medical schools might consider adding a telemedicine curriculum and standardized patient experiences in the undergraduate medical setting.

Keywords: confidence; medical education; satisfaction; standardized patient; telemedicine.

While telemedicine has slowly gained traction in recent years, the coronavirus 2019 (COVID-19) global pandemic rapidly promoted its use to the forefront of healthcare delivery [1]. Telemedicine offers a safe alternative to office visits, allowing patients and healthcare providers to communicate over the phone or through video conferencing software, especially during times when travel and physical movement is restricted. While the use of telemedicine expanded with the COVID-19 pandemic, some physicians and medical students are struggling with how to use telemedicine to best meet healthcare demands [2–4].

In a previous study [5] of 89 resident physicians who participated in a 3 year program on telemedicine, only two (2.2%) indicated an ability to utilize telehealth in future practice before the program began. After completion of the program, 24 of 58 (41.4%) reported an ability to utilize telehealth in future practice [5]. In another study [6] of 25 resident learners who participated in a virtual standardized patient experience, “learners received well-done evaluations in fewer than 50% of telemedicine-specific assessment items” [6]. The effective use of telemedicine in clinical practice requires physicians to use a different set of communication skills than are required in face to face encounters, including relationship development on a virtual platform and performing remote physical examinations [6]. The current levels at which telemedicine is integrated into medical school curricula varies widely among both osteopathic and allopathic medical schools; some use it for
patient encounters, some for didactic learning, and some for scholarly projects [7]. With varying levels of telemedicine education present, many medical students remain hesitant about their ability to effectively and efficiently utilize telemedicine [6].

Social distancing recommendations and increased use of telemedicine visits during the COVID-19 pandemic highlighted the critical need for telemedicine training in undergraduate medical education. Implementing standardized patient experiences into telemedicine can provide a valuable opportunity for medical students to practice and assess the skills they will need in clinical practice. Therefore, the goal of the present study was to quantitatively evaluate first year medical students’ confidence and satisfaction with using telemedicine before and after a standardized patient encounter.

**Methods**

This study was approved by the Institutional Review Board (IRB) at Edward Via College of Osteopathic Medicine (VCOM)–Carolinas (VCOM-Carolinas). The informed consent requirement was waived by the IRB, as participation in the study presented no more than minimal risk of harm to subjects and involved no procedures for which written consent is normally required outside of the research context.

First year medical students enrolled at Edward Via College of Osteopathic Medicine-Carolinas (VCOM-Carolinas) campus were recruited by email. Participants were provided information on the study and consent was assumed by voluntary participation. A link to the survey (Supplementary Material) was sent to all 162 first year medical students immediately before participation in a standardized patient encounter that was part of the medical school curriculum; the email containing the survey link was sent on August 16, 2020 and the standardized patient encounter occurred on August 17, 2020. The same survey (Supplementary Material) was distributed immediately following the encounter on August 17, 2020 and remained open until September 4, 2020. The 12 item survey (Supplementary Material) was developed by three of the authors (E.U., G.W., T.L) and assessed, on a five point Likert scale, students’ confidence with using telemedicine and their anticipated level of satisfaction with telemedicine. The survey response scale included the following options: “not confident,” “a little confident,” “somewhat confident,” “confident,” and “extremely confident.” Demographic information, including participant age and highest completed level of education, were also collected. All survey responses were collected anonymously.

**Standardized patient encounter**

Between the preencounter and postencounter survey, all students (including those who responded and chose to participate in this study survey as well as those who did not) used SIMULATIONIQ telemedicine software (Education Management Solutions) to conduct a 15 min standardized patient encounter. The standardized patient, which was designed by VCOM faculty as a part of the first year medical school curriculum, was hypothetically presenting to an outpatient medicine clinic for evaluation of a skin rash. Prior to the encounter, students were given pre-laboratory modules to complete, wherein VCOM-Carolinas faculty members discuss possible diagnoses and relevant differential diagnoses, physical exam findings, laboratory results, imaging, and treatment plans.

**Data analysis**

Data were analyzed using comparative statistics including Fisher exact tests on independent pre and post groups to compare the participants’ responses before and after the standardized patient telemedicine encounter. Statistical significance was set at p<0.05.

**Results**

Of the 162 first year medical students enrolled at VCOM-Carolinas, 103 (63.6%) completed the preencounter survey and 74 (45.7%) completed the postencounter survey after the encounter; 29 (28.2%) were lost between the two survey administrations. There was no statistically significant differences in age or level of education between those who completed the survey before and after the encounter (p=0.999; Table 1).

Before the patient encounter, 20 participants (19.4%) reported being “not confident,” 37 (35.9%) reported being “a little confident,” 35 (34.0%) reported being “somewhat confident,” 10 (9.7%) reported being “confident,” and one (1.0%) reported being “extremely confident” in their ability to conduct a patient interview over a telemedicine platform. After completing the encounter, participant confidence increased, with the following response rates: one (1.4%) “not confident,” 15 (20.3%) “a little confident,” 24 (32.4%) “somewhat confident,” 32 (43.2%) “confident,” and two (2.7%) “extremely confident” (p<0.001; Figure 1).

For questions regarding participants’ confidence establishing a doctor-patient relationship using telemedicine, the following responses were entered to the

| Table 1: Participant demographics. |
|-----------------------------|---------------------------------|-----------------------------|
| Age, years                  | Preencounter survey (n=103), n (%) | Postencounter survey (n=74), n (%) |
| 21–23                       | 45 (43.7)                        | 33 (44.6)                   |
| 24–26                       | 31 (30.1)                        | 21 (28.4)                   |
| 27–31                       | 8 (7.8)                          | 6 (8.1)                     |
| Unknown                     | 19 (18.4)                        | 14 (18.9)                   |
| Education level             |                                  |                             |
| Bachelor’s degree           | 75 (72.8)                        | 57 (77.0)                   |
| Master’s degree             | 28 (27.2)                        | 17 (23.0)                   |
preencounter survey: 18 participants (17.5%) reported being “not confident,” 32 (31.1%) reported being “a little confident,” 35 (34.0%) reported being “somewhat confident,” 15 (14.6%) reported being “confident,” and three (2.9%) reported being “extremely confident” in their ability. After completing the simulated patient encounter, participant confidence increased, with four (5.4%) reporting that they were “not confident,” 12 (16.2%) reporting “a little confident,” 17 (23.0%) reporting “somewhat confident,” 28 (37.8%) reporting “confident,” and 13 (17.6%) reporting they felt “extremely confident” (p<0.001; Figure 2).

Prior to the encounter, six participants (5.9%) reported feeling “not satisfied” that telemedicine experiences helped them to prepare for clinical practice; 26 (25.5%) felt “a little satisfied,” 43 (42.2%) felt “somewhat satisfied,” 24 (23.5%) felt “satisfied,” and three (2.9%) felt “very satisfied.” Postencounter, five participants (6.8%) were “not satisfied,” nine (12.2%) were “a little satisfied,” 21 (28.4%) were “somewhat satisfied,” 28 (37.8%) were “satisfied,” and 11 (4.9%) were “very satisfied” that the telemedicine experience helped to prepare for them for clinical practice (p<0.001; Figure 3).

As a group, participants reported greater confidence in their ability to perform telemedicine consultation (p<0.001), conduct a patient interview (p<0.001), conduct a patient interview over telemedicine (p<0.001), conduct an augmented reality physical examination over telemedicine (p<0.001), diagnose a patient’s condition over telemedicine (p<0.001), recommend a treatment plan via telemedicine (p<0.001), establish a doctor-patient relationship over telemedicine (p<0.001) after the telemedicine standardized patient encounter. Participants reported increased satisfaction with telemedicine (p<0.001) and increased agreement that the telemedicine standardized patient experience helped their preparation for clinical practice (p=0.02) (Table 2).
Discussion

As the COVID-19 pandemic rapidly changes the landscape of clinical medicine, it is pertinent for medical students to practice interacting with patients over telemedicine platforms. While it is difficult to quantify the number of medical schools presently using telemedicine in their curricula due to the lack of contemporary data in the literature, the American Medical Association previously articulated a need for more telemedicine-specific education for medical students and residents alike [7]. A mixed-methods review [8] of 17 medical schools found that the clerkship phase of medical education is where the majority focused most of their telemedicine learning, as interacting with patients online has become a large part of clinical practice. Only 10 of the 17 medical schools (59%) in that study [8] included telemedicine experiences for patient encounters or standardized patients in the preclinical years. A relative lack of exposure to telemedicine may leave medical students and new residents unprepared in a clinical environment. Students in a previous study [5] recognized the benefit and relevance of additional telemedicine training to their future practice.

In our study, the addition of a standardized telemedicine encounter to the undergraduate medical education curriculum afforded first year medical students the opportunity to evaluate their own confidence and satisfaction with telemedicine. A higher number of participants reported confidence and satisfaction with a telemedicine encounter as well as confidence and satisfaction in their ability to conduct encounters, connect with patients, and preparedness to use these skills into their future practice.

Osteopathic physicians should be aware of these findings because providing excellent care despite current limitations and social distancing guidelines is paramount for our patients. Telemedicine is a solution that keeps patients, providers, and learners safe from unnecessary harm; as such, it is an invaluable resource that will remain part of the clinical care landscape even after the COVID-10 pandemic. As osteopathic physicians, we understand the impact this may have on a person’s overall well being [9]. Using telemedicine in a way that is effective for medical care and maintains the doctor-patient relationship depends on developing unique skills [6]. Medical schools may therefore consider adding telemedicine training into undergraduate medical curricula.

Limitations

The present study is not without limitations. One limitation was the use of standardized patients. While the experience...
is designed to simulate a real clinical encounter, we understand that using real patients presenting with legitimate health concerns would have added value to the current study.

Another limitation was the voluntary nature of the study; therefore, the data may not represent the entire first year medical class. Additional limitations of this study include loss of participants from the preencounter survey (n=103) to the postencounter survey (n=74). Application of our results may also be limited by the fact that all participants attending one osteopathic medical school. Future studies could compare these results with those of students from other institutions.

Furthermore, the study only evaluated first year medical students; thus, future studies would be needed to determine whether the same lack of confidence is present for medical students who are further along in their education. While our study demonstrated improved confidence with telemedicine training, it does not evaluate how long those effects will last.

The study is also subject to self-reporting bias. Self-reported data can be affected by external bias linked to social desirability or approval [10], which would cause participants to report higher scores than what they may actually feel out of fear of being viewed a certain way due to their responses. Our survey worked to mitigate this effect by collecting all participant responses anonymously.

Conclusions

Our study revealed a self-reported lack of confidence and satisfaction in telemedicine among first year medical students at Edward Via College of Osteopathic Medicine-Carolinas that was improved after a standardized patient experience over a telemedicine platform. Future studies should investigate similar changes among third and fourth year medical students because students later in their training, who are encountering numerous patients per day either in person or via telemedicine, may provide deeper insight into the utility of telemedicine education during medical school.

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Competing interests: None reported.

Informed consent: Participants were provided with information about this study and consent was assumed by voluntary participation. The requirement for informed consent was waived by the Institutional Review Board at Edward Via College of Osteopathic Medicine as participation in this study presented no more than minimal risk of harm to subjects and involved no procedures for which written consent is normally required outside the research context.

Ethical approval: This study was approved by the institutional review board at Edward Via College of Osteopathic Medicine (#1687953-2).

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