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Effect of In-Class vs Online Education on Sexual Health Communication Skills in First-Year Medical Students: a Pilot Study

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Abstract Objective

Online education is effective for knowledge acquisition, but its effect on clinical skill development is not well characterized. We aimed to compare communication skills of 50 first-year medical students who learned to assess and treat patients through an online learning module vs an in-class lecture.

Methods

Twenty-six students were randomized to learn about antidepressant-induced sexual dysfunction in class and 24 learned the same content through an online module. Students were individually observed conducting an interview with a standardized patient with antidepressant-induced sexual dysfunction. Students were assessed by faculty raters blinded to the student's learning mode. Standardized patients were asked about their willingness to have the student as their physician.

Results

More students who learned in class vs online demonstrated appropriate verbal empathy (18 [69%] vs 8 [33%]; $P = 0.01$), defined as completing each task in the "verbal empathy" assessment domain, as measured by a faculty rater. Other assessed variables were not significantly different. Standardized patients' willingness (vs unwillingness; $P = 0.01$) to have the student as their physician was associated with the demonstration (by faculty appraisal) of a number of basic skills: using open-ended questions, asking one question at a time, using gender-neutral terminology when asking about the patient's relationship, and using appropriate sexual-health terminology.

Conclusions

This study, although limited by a single-site design and the small number of participants, offers preliminary evidence that, if confirmed, may suggest that in-class learning from a psychiatrist (vs from an online module) is associated with greater verbal empathy in the assessment of SSRI-related sexual dysfunction.

Keywords Communication skills · Medical education · Online education · Simulation · Standardized patients

Online teaching methods are growing in popularity and generally are now included in the curricula of medical schools in the USA [1]. Pedagogical models such as flipped classrooms, blended learning, and e-learning have been praised for being student-centered, allowing self-paced learning, and freeing up

time in the physical classroom to think critically about and engage actively with the material [2]. Undergraduate medical students have had little difficulty adjusting to newer educational platforms [3], and by providing online modules and lessons, medical schools can broadly extend educational offerings.

Knowledge acquisition from online classes is equivalent to that obtained through traditional lectures; this equivalency has been shown across multiple disciplines, including otolaryngology—head-and-neck surgery [4], medical ethics [5], and end-of-life care [6]. Although faculty and support staff must invest considerable time in developing and maintaining online learning modules, learner and educator satisfaction with

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online curricula has generally been positive, and outcomes of objective structured clinical examinations have been similar to those obtained with traditional teaching methods [7–9].

Nevertheless, few studies have assessed student interview skills that are developed through online education. Knutson et al. [10] specifically discuss difficulties in translating online learning into clinical skills. Although a poll of undergraduate medical students showed that most believed that e-learning enhanced their clinical skills [3], a separate study that included a standardized patient examination showed that students trained with small-group discussion plus computer-assisted instruction underperformed with regard to patient satisfaction when compared with a control group that trained exclusively with small-group discussions [5]. Additionally, few studies have examined online modalities in the context of teaching psychiatric interviewing, and the outcomes of existing studies in psychiatric education are highly variable because of methodologic disparities that complicate data interpretation [8].

An important question in medical student psychiatry education, then, is whether clinical skills and patient satisfaction with interviewing, particularly in more sensitive topic areas, can be more effectively developed through an online modality or an in-person (traditional) lecture with a faculty member. We were interested in addressing this question with the topic of antidepressant-induced sexual dysfunction, given its clinical relevance and the specific knowledge and skill required for effective assessment. Antidepressant-induced sexual dysfunction is common, with Montejo and colleagues [11] reporting an incidence rate of 58 to 73%, and it is among the most common adverse effects (50.8%) that lead to treatment discontinuation [12]. Many patients (up to 75%) believe that physicians will dismiss their sexual concerns [13] and lack confidence that they would receive effective treatment for sexual dysfunction [14]. Furthermore, medical students commonly have insufficient knowledge about sexual function and dysfunction, inadequate communication skills, and discomfort with sexual language [15].

We capitalized on combining this sensitive topic with medical student discomfort in approaching the topic to evaluate how different modalities of psychiatry education affected patient care. We hypothesized that students who learned online would do as well as their in-class peers in the assessment and treatment of a standardized patient with antidepressant-induced sexual dysfunction.

Methods

The study was deemed not to be human research by the Mayo Clinic Institutional Review Board (protocol number 15–003942). The reporting of this study is in compliance with the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement [16].

Education Format

This was a single-site study of all first-year medical students ($n = 50$) taking an existing psychopathology course at the Mayo Clinic School of Medicine (Rochester, MN). The course consists of in-person didactic sessions, online modules, and case-based discussion groups, plus eight 2-h sessions (tutorials) on patient interviewing that are led by faculty members. These tutorials are conducted in small groups (five students) and interview patients with psychiatric illnesses. For this project, one tutorial was replaced by the individual, observed student interview of a standardized patient.

Students were randomized through the random number generator function in Microsoft Excel to attend an in-person lecture (traditional lecture format) or to review an online learning module on selective serotonin reuptake inhibitor (SSRI)-related sexual adverse effects. The traditional lecture included two faculty psychiatrists (one lecturer plus a course director who provided additional clinical experience), a slide deck presentation related to the interaction between antidepressants and sexual dysfunction, and case studies depicting these concepts. The online module was developed by the same person who gave the in-class lecture; it consisted of an expanded version of the presentation and included the same case studies and comprehension checks after informational slides. Neither the in-class lecture nor the online module incorporated videos. All students were told that their clinical skills on the topic would be assessed but not graded.

Student Assessment

Students were assigned to individually interview a standardized patient, conducting a typical psychiatric interview as they had practiced previously. The standardized patient had sexual adverse effects from a recently initiated SSRI medication. The interview was conducted with real-time video observation and assessment by faculty raters positioned outside the interview room. Students were assessed by using an observation form, loosely based on the Patient-Centered Observation Form [17], but tailored for use with first-year medical students. The student assessment focused on basic medical communication tasks and content that specifically addressed SSRI-related sexual dysfunction. The assessment included seven domains: (1) introduction (introduce self, define role in patient's care, sit down, begin with open-ended question or clarify that this is a follow-up visit), (2) verbal empathy (use hopeful or supportive remarks, use continuer phrases, repeat back important information, match patient's tone and mood), (3) nonverbal empathy (eye contact, leaning in or smiling as appropriate, facial expression reflective of patient mood), (4) basic skills (mostly open-ended questions, one question at a time, gender-neutral terminology, appropriate sexual-health terminology), (5) depression follow-up (guilt, mood, sleep, appetite,

concentration, self-harm ideation, medication adverse effects, questions about changes in desire, arousal, and orgasm), (6) closure (summarize, ask for questions), and (7) sensitivity (appropriate tone and demeanor).

Raters, blinded to the student's method of education, evaluated student performance on each of the seven domains on the assessment checklist (introduction, verbal empathy, non-verbal empathy, basic skills, depression follow-up, closure, and sensitivity). Each domain had three to five criteria, and students had to meet all the criteria to be considered successful in that domain. For example, a student who comfortably asked open-ended questions, used appropriate sexual-health terminology, chose gender-neutral relationship terminology, and asked one question at a time would be scored as successfully completing the "basic skills" domain.

Standardized patients were surveyed after the interview to assess how they perceived the care that they received. A satisfaction survey, adapted from the Accreditation Council for Graduate Medical Education Core Competency Assessment toolkit [18], gauged the communication skills and delivery of the student, as well as asking the patient's overall rating of the student's interaction and willingness to have the student as a provider in the future. Students received feedback from the faculty member and the standardized patient, but the assessment forms were not shared directly with the student, nor were they part of any graded aspect of the course.

Statistical Analysis

Proportions of students who completed each domain of the assessment checklist were compared by type of instruction by using the χ^2 or Fisher exact tests. Similarly, the proportion of patients who were willing to have the student as their provider was examined for each domain of the student assessment scale. *P* values less than 0.05 were considered

statistically significant. Statistical analyses were conducted with SAS software (version 9.4; SAS Institute Inc.).

Results

Fifty first-year medical students were included in the study; 26 were randomized to the in-class learner group, and 24 were randomized to the online module group. Twelve women (46%) were in the in-class group and 13 women (54%) were in the online module group ($P = 0.58$). All in-class learners were white, and 21 (88%) of the online module learners were white ($P = 0.07$). The in-class learner group had a mean (SD) age of 26.6 (1.83) years, and the online learner group had a mean (SD) age of 28.6 (5.0) years ($P = 0.06$). All students in the class were present and participated in the experience.

Faculty assessment of outcomes is shown in the Table 1, stratified by the type of instruction. The domains most frequently completed successfully were nonverbal empathy for the in-class group ($n = 22$ [85%]) and introduction for the online group ($n = 18$ [75%]). The largest difference between in-class and online learners was completion of the verbal empathy domain (18 [69%] vs 8 [33%], respectively; $P = 0.01$). The in-class group showed higher completion rates for several other domains (e.g., nonverbal empathy, sensitivity), but the differences were not statistically significant. Similarly, the learning mode (in class vs online) did not make a significant difference in the standardized patients' willingness to have students as providers ($P = 0.27$).

More patients were willing to have a student provider if that student completed the basic skills domain than if the student had not (21 [60%] vs 3 [20%], respectively; $P = 0.01$). The other performance domains were not significantly associated with the patients' willingness to have the student as their provider. Of note, in-class and online learners successfully completed this domain with equal frequency (Table 1).

Table 1 Assessment of student interviews of standardized patients

Domain or outcome	In-class learning ($n = 26$), no. (%)	Online learning, ($n = 24$), no. (%)	<i>P</i> value
Assessment by faculty			
Introduction	21 (81)	18 (75)	0.62
Verbal empathy	18 (69)	8 (33)	0.01
Nonverbal empathy	22 (85)	15 (63)	0.07
Basic skills	14 (54)	10 (42)	0.40
Depression follow-up	8 (31)	2 (8)	0.08
Closure	6 (23)	7 (29)	0.62
Sensitivity	9 (35)	3 (13)	0.07
Standardized patient			
Willingness to have student as a provider	17 (65)	12 (50)	0.27

Each assessment domain had three to five criteria, and students had to meet all the criteria to be considered successful in that domain. The results show the students who successfully completed each domain

Discussion

In this study, students who learned about the assessment and treatment of antidepressant-induced sexual dysfunction through an in-class lecture from a psychiatrist were more likely to show appropriate verbal empathy than students who learned the material online. The groups were not significantly different in terms of nonverbal empathy, sensitivity, and depression follow-up. These findings are preliminary in nature, given the small sample size and single-site design, but they raise an interesting question about how clinical skill development may be differently affected by in-class vs online learning.

Few studies have gauged the impact of medical education on the patient reactions to the care received. This study's second major finding was that the presence of basic skills—comfortably using open-ended questions, appropriate sexual-health terminology, gender-neutral relationship terminology, and asking one question at a time—was significantly associated with the standardized patient's willingness to have the student as their doctor.

The disparity in the verbal empathy scores between the two learner groups may or may not be attributable to the lack of the live interaction with a psychiatrist for the online-learning group. If indeed this was related to the observed finding, the lecture setting may have allowed students to see nonjudgmental curiosity about a patient experience role-modeled by a psychiatrist. This experience may have facilitated greater engagement or increased comfort with the topic, and the flow of a traditional lecture, with the opportunities for students to ask direct questions, may have resulted in better verbal skills acquisition and thus a better display of verbal empathy with the patient. The experience of the faculty member in the room (K.J.S.) was that the learning environment seemed to be consistent with other lectures in the course (e.g., no uncomfortable laughter or silence, earnest questions that were typical of other areas of the course, descriptions of faculty experiences with patients). Another possible cause is a discrepancy in attention between the two groups, which can be especially important when teaching clinical skills about sensitive topics. For example, computer-based learners may have dedicated less time to the modules compared with the time that in-class learners spent in the traditional lecture setting because medical students tend to be uncomfortable with topics in sexual education [15].

Limitations of this study include the small sample size (one medical school class), which may have diminished the ability to detect statistically significant differences. The areas of performance that did not reach statistical significance in this study could be assessed in the future when further examining the impact of education on patient care skills. The single-site design may limit generalizability, although randomization should help guard against bias, and students at our institution

are unlikely to be inherently more or less comfortable with sexual topics than students at other institutions. The learning platform used for the online portion of the study did not allow measurement of completion rates or time on task, but students were aware that they would have a standardized patient encounter based on the content; a learning platform that allowed us to measure time on task and completion rates would have been preferable. Finally, the quality of the online module (an enriched slide deck presentation with case examples and comprehension checks) may have limited its effectiveness; a further study could assess the impact of embedding patient video material or other demonstration of the use of appropriate sexual terminology by experts.

In conclusion, this pilot study demonstrates that in-class learning with an expert is more effective than online modules for helping students develop effective verbal empathy with patients on the sensitive topic of SSRI-related sexual dysfunction. Further, it shows that specific, teachable interviewing skills are associated with patients' willingness to have a student as their health care provider. These findings should inform further inquiry and may be important to consider in medical school sexual health curriculum development.

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Compliance with Ethical Standards

Ethical Considerations This study was deemed not to be human research by the Mayo Clinic Institutional Review Board (protocol number 15-003942).

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References

1. Clinefelter DL, Aslanian CB. Online college students 2014: Comprehensive data on demands and preferences. Louisville: The Learning House, Inc.; 2014.
2. Ruiz JG, Mintzer MJ, Leipzig RM. The impact of E-learning in medical education. *Acad Med.* 2006;81(3):207–12.
3. Gornley GJ, Collins K, Boohan M, Bickle IC, Stevenson M. Is there a place for e-learning in clinical skills? A survey of undergraduate medical students' experiences and attitudes. *Med Teach.* 2009;31(1):e6–12.
4. Vaccani JP, Javidnia H, Humphrey-Murto S. The effectiveness of webcast compared to live lectures as a teaching tool in medical school. *Med Teach.* 2016;38(1):59–63.
5. Fleetwood J, Vaught W, Feldman D, Gracely E, Kassutto Z, Novack D. MedEthEx online: a computer-based learning program in medical ethics and communication skills. *Teach Learn Med.* 2000;12(2):96–104.
6. Day FC, Srinivasan M, Der-Martirosian C, Griffin E, Hoffman JR, Wilkes MS. A comparison of web-based and small-group palliative

- and end-of-life care curricula: a quasi-randomized controlled study at one institution. *Acad Med.* 2015;90(3):331–7.
7. Karam-Hage M, Brower KJ, Mullan PB, Gay T, Gruppen LD. Web-streamed didactic instruction on substance use disorders compares favorably with live-lecture format. *Acad Psychiatry.* 2013;37(3):165–70.
 8. Krain LP. "It's high-tech, but is it better?": applications of technology in psychiatry education. *Acad Psychiatry.* 2007;31(1):40–9.
 9. Chan CH, Robbins LI. E-learning systems: promises and pitfalls. *Acad Psychiatry.* 2006;30(6):491–7.
 10. Knutson D, Cain T, Hurtubise L, Kreger C. Lessons learned: developing e-learning to teach physical examination. *Clin Teach.* 2006;3(3):163–9.
 11. Montejo AL, Llorca G, Izquierdo JA, Rico-Villademoros F. Incidence of sexual dysfunction associated with antidepressant agents: a prospective multicenter study of 1022 outpatients. Spanish working Group for the Study of psychotropic-related sexual dysfunction. *J Clin Psychiatry.* 2001;62(Suppl 3):10–21.
 12. Rosen RC, Lane RM, Menza M. Effects of SSRIs on sexual function: a critical review. *J Clin Psychopharmacol.* 1999;19(1):67–85.
 13. Marwick C. Survey says patients expect little physician help on sex. *JAMA.* 1999;281(23):2173–4.
 14. Ende J, Kazis L, Ash A, Moskowitz MA. Measuring patients' desire for autonomy: decision making and information-seeking preferences among medical patients. *J Gen Intern Med.* 1989;4(1):23–30.
 15. Parish SJ, Clayton AH. Sexual medicine education: review and commentary. *J Sex Med.* 2007;4(2):259–67. quiz 68
 16. von Elm E, Altman DG, Egger M, Pocock SJ, Gøtzsche PC, Vandenbroucke JP, et al. The strengthening of reporting of observational studies in epidemiology (STROBE) statement: guidelines for reporting observational studies. *J Clin Epidemiol.* 2008;61(4):344–9.
 17. Chesser A, Reyes J, Woods NK, Williams K, Kraft R. Reliability in patient-centered observations of family physicians. *Fam Med.* 2013;45(6):428–32.
 18. Rider EA, Keefer CH. Communication skills competencies: definitions and a teaching toolbox. *Med Educ.* 2006;40(7):624–9.