Twelve Tips for Utilizing Virtual Patients to Teach Professionalism

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Abstract

Professionalism is an essential element of healthcare professional curriculum. However, teaching professionalism is complex and requires engaging and effective strategies. Virtual patients, in the form of computer-generated simulated clinical scenarios, can be used as a strategy to teach professionalism. The use of virtual patients provides an interactive and accessible learning tool along with opportunities for repetitive practice. This paper proposes twelve tips for utilizing virtual patients to teach healthcare professionalism. These tips are based on an extensive review of the relevant literature and the author’s experience. The application of these tips may facilitate teaching professionalism using virtual patients and improve learning and retention of information.

Keywords: Professionalism, Clinical teaching, Simulation

Introduction

Virtual patients are "a specific type of computer program that simulates real-life clinical scenarios; learners emulate the roles of health care providers to obtain medical history, conduct a physical exam, and make diagnostic and therapeutic decisions" (AAMC, 2007). Virtual patients are increasingly used in health professions education (Cook & Triola, 2009; Ellaway et al., 2009; Poulton & Balasubramaniam, 2011). The benefits of using virtual patients appear similar to those from other forms of simulation in medical education (Ellaway et al., 2015); while virtual patients may be costly and resource-intensive to produce (AAMC, 2007; Cendan & Lok, 2012; Ellaway et al., 2015; Huang et al., 2007), they provide a flexible and accessible learning tool with opportunities for repetitive practice without putting actual patients at risk (AAMC, 2007; Issenberg, 2006). To be an effective educational tool, virtual patients need to be used judiciously (Edelbring et al., 2012; Ellaway et al., 2015; Huang et al., 2007; Huwendieck et al., 2013; Issenberg, 2005). When used appropriately, virtual patients can help to facilitate learning (Cook & Triola, 2009), enhance retention (Botezatu et al., 2010a), and provide a transformative learning experience (Kleinheksel, 2014).
Virtual patients have been effectively used for the development of clinical reasoning and conceptual knowledge (Botezatu et al., 2012a; Cook et al., 2010; Cook & Triola, 2009; Edelbring et al., 2012; Gesundheit et al., 2009; Huwendiek et al., 2009), and to improve problem solving (Cook & McDonald, 2008), and decision making (AAMC, 2007).

Teaching professionalism is an essential element of a health professional curriculum (Cruess et al., 2014; Cruess et al., 1997; Hunkar & Senol, 2014). Professionalism has been defined as "the habitual and judicious use of communication, knowledge, technical skills, clinical reasoning, emotions, values, and reflection in daily practice for the benefit of the individual and community being served (Epstein & Hundert, 2002)." Although there is little consensus on optimal educational methods for teaching and evaluating professionalism (Birden et al., 2013), virtual patients have also been utilized in professionalism curricula (McEvoy et al., 2012). Despite the fact that students often recognize the importance of studying professionalism (McEvoy et al., 2012), it is challenging to get them engaged (Stockley & Forbes, 2014). Using virtual patients as a method to teach professionalism provides an opportunity to increase the relevance of the professionalism curriculum through the inclusion of current and realistic clinical scenarios (Khandelwal et al., 2015; Botezatu et al., 2010a), and provide an opportunity for students to "learn by doing". Virtual patients were reported to be engaging and well accepted by students as an effective learning strategy (Botezatu et al., 2010a; Gesundheit et al., 2009; McEvoy et al., 2012).

This paper describes 12 tips for using virtual patient to teach professionalism and professional identity.

Twelve Tips for Utilizing Virtual Patients to Teach Professionalism

**Tip #1: Integrate professionalism into clinical virtual patient scenarios**
Integrating concepts of professionalism into clinical virtual patient scenarios may work better than scenarios which focus on aspects of professionalism alone (McEvoy et al., 2012). For example, instead of having a virtual patient case focused on "gaining informed consent", virtual patient scenarios can incorporate the consent process for a surgical procedure; or instead of having a case focused on "confidentiality", breach of confidentiality could be built into a case focused on the development of other technical clinical skills. Skills such as open-ended questioning and active listening can be built into virtual patient scenarios including history taking (Posel et al., 2014). This integrated approach situates professionalism as part of each clinical scenario which mimics reality, and is also likely to foster student engagement due to the integration with the often more engaging topics of clinical procedures and skills.

**Tip #2: Build teamwork and collaboration into cases**
The potential for virtual patient cases to be used for collaborative problem solving in on-line or face-to-face discussion groups can provide an opportunity to practice teamwork and collaboration (Ellaway et al., 2015) which are foundational to health professional practice in Canada (CIHC, 2010). Students can be asked to work in groups in the virtual environment to discuss or provide feedback on an online case, and the quality of that discussion can be monitored and assessed. Alternative formats include having students work through a case as preparation prior to class or prior to a clinical encounter, and following this by in-class discussion or discussion with the health care team in a clinical setting (Posel et al., 2014). Group activities using virtual patients can also provide an opportunity for interprofessional learning, where shared professional values can be explored.

**Tip #3: Know when – and when not – to use virtual patient cases**
Virtual patient is an educational tool which should be used as part of a larger "professionalism curriculum" (Edelbring et al., 2012; Ellaway et al., 2015; Howendiuk et al., 2013; Huang et al., 2007; Issenberg, 2006). Virtual cases alone will not suffice to teach professionalism; multiple strategies and learning approaches which address
different learning styles and different contextual needs should be incorporated into the professionalism curriculum, as individual learning styles can affect the efficacy of virtual patients as a learning tool (Cook & Triola, 2009).

As with any teaching or learning strategy, "when to use what" will depend on the learning objective and desired learning outcome (Edelbring et al., 2012; Huwendiek et al., 2013), and it is important to be purposeful when selecting - or not selecting - a virtual patient case as the teaching strategy. Virtual patient cases can be used in a variety of educational formats, including tutorials, problem-based learning and seminars (Poulton & Balasubramaniam, 2011). Where case based learning is being considered, virtual patient cases are potentially more realistic and engaging (Cook & Triola, 2009) than traditional paper based cases. As with any case based learning, virtual patients may be a useful precursor or adjunct to clinical practice or interaction with real patients, but do not replace it (Botezatu et al., 2010a; Cook & Triola, 2009; Poulton & Balasubramaniam, 2011); for example students may learn the steps of a health interview through a virtual patient case, but need interaction with real patients in order to solidify the skills and develop personal traits such as empathy (Cook & Triola, 2009).

Appropriate sequencing and coordination of virtual patient cases into the curriculum is also important; in a study by Huwendiuk the sequence of lecture – virtual patient case – small group discussion and then an encounter with a real patient was found to be effective. It may also be beneficial to use virtual patients early in the curriculum, as student acceptance of virtual patients has been shown to be greater in novice students (Gesundheit et al., 2009).

Tip #4: Debrief the cases
A structured debrief following completion of virtual patient cases is a valuable adjunct to learning and increases the perceived benefit of the cases by students (Edelbring et al., 2001; Kihlgreen et al., 2015). Although virtual patient cases are appropriate for independent study (Ellaway et al., 2015), follow up activities such as seminars, small group discussion or guided reflection have been shown to help and guide students to explore complex issues and situations (McEvoy et al., 2012) such as those relating to professional behavior, as well as answering questions which were elicited by the case (Posel et al., 2014). Debriefing with a clinical tutor or a practicing professional may be particularly helpful due to the "real life" clinical perspective they bring to the discussion (Edelbring et al., 2012). A structured debrief (see tip #4) can also provide an opportunity for incorporating reflection into the learning experience (Posel et al., 2014).

Tip #5: Watch for the informal curriculum
When developing any virtual patient case, it is important to consider the professional competencies demonstrated even if they are not the key focus of the case. As well as the incorporation of appropriate clinical information and clinical skills, any virtual patient case will portray "professional" aspects of the case such as communication and collaboration between team members. This (sometime inadvertent) portrayal of professional behaviors or values provides positive - or negative- role modeling which can influence professional identity development as well as the development of professional behaviors (Cote & Laughrea, 2014; Doja et al., 2015; Passi et al., 2013). While both positive and negative professionalism can provide a basis for discussion, positive portrayal of professionalism in a clinical virtual patient scenario may help counteract the effects of negative role modelling in the clinical setting.

Tip #6: Take into account the educational level of your learner
As with other learning tools, virtual patient cases should be designed for the level of learner and progressed from simple to complex through the curriculum (Huwendiek et al., 2013; Issenberg et al., 2005; McGaghie et al., 2010). Overly complex cases add additional cognitive load to novice learners which may inhibit learning (Chen et al., 2015; Cook & Triola, 2009), while overly simple cases are not engaging for more advanced learners (Geishundheit et al., 2009). Cases early in the curriculum may focus on knowledge acquisition, such as the content of codes of ethics, while later cases may focus on ethical decision making in situations which present a challenge to the
learner evolving professional identity. While early cases may focus on situations where licensing body standards of practice around maintenance of professional boundaries is clear (such as not having sexual relations with a patient), later cases may present situations where the management of boundaries is less clear and ask students to reflect on the pros and cons of different courses of action.

**Tip #7: Use virtual patient cases for Assessment**

Assessment of professionalism is challenging (Arnold, 2002; Ginsburg et al., 2000; Hodges et al., 2010), due in part to the need to interpret the rationale and motivation behind observable behavior and also the contextual nature of professional behavior (Ginsburg et al., 2004; Passi et al., 2013; Ginsburg et al., 2000; Health & Care Professions Council, 2014). Assessment is however essential, not only to ensure that students have an appropriate level of competence for stage of training, but also to promote student engagement with the professionalism curriculum (McEvoy et al., 2012). Virtual patient cases can provide a vehicle for evaluating student response to a variety of contexts requiring differing professional responses, as well as providing insight (through the steps taken by the student) into the reasoning and thought process which led to a specific course of action (Cendan & Lok, 2012).

Virtual patients can provide an effective tool for the both formative and summative assessment of professional competency (Cook & Triola, 2009; McEvoy et al., 2012; Huwendiek et al., 2013; Waldmann et al., 2008). Formative assessment can help identify learning needs (Posel et al., 2014), while summative assessment can ensure students are meeting "professionalism milestones" in a competency based curriculum.

Using virtual patients as an assessment tool can be more advantageous when compared with more traditional assessment methods (such as multiple choice questions) due to the increased realism incorporated into the cases and the ability to integrate multiple facets of case management into a single scenario (Round et al., 2009; Waldman et al., 2008). Virtual patients also have the advantage that assessors can view student interaction with each case and the steps taken to reach a decision (Cendan & Lok, 2012; McEvoy et al., 2012), which may give insight into the learners level of professional development. Additional advantages of using virtual patients for assessment include improved retention of learning with frequent exposure to virtual patient assessment (Botezatu et al., 2010a), and learner familiarity with this type of simulation as an assessment strategy, which may be beneficial as licensing bodies begin to consider this format for high stakes licensing exams (Dillon & Clauser, 2009).

Evidence shows that students look favorably on virtual patients as an assessment tool (Botezatu et al., 2010a), and have identified assessment of virtual patient topics as an important factor for effective integration of virtual patients into the curriculum (Huwendiek et al., 2013).

It is important to consider what elements of a task are appropriate to be assessed using a virtual patient case, as opposed to other assessment methods. For example, if the learning goal is for students to learn how to effectively delegate specific tasks to assistants or family members, the virtual patient case could test knowledge of what tasks are appropriate to delegate and the steps involved, while an OSCE (Objective Structured Clinical examination) could be used for practical demonstration of the process.

**Tip #8: Consider cost-effectiveness**

Virtual patient cases are costly and time consuming to produce (Cendan & Lok, 2012; Ellaway et al., 2015; Huang et al., 2007). The ongoing costs include revisions needed to keep cases current, maintenance of the web platform, and tutor support. These costs, as well as the efficacy and appropriateness of virtual patients as an educational tool (see tip #3), must be balanced against more traditional teaching methodologies such as lecture, paper based cases, or direct clinical experience (Ellaway et al., 2015).

When compared to the costs of other simulation techniques commonly utilized as a means for professionalism education, such as standardized patients, virtual patients may be cost effective. Once developed, they can be
repeatedly utilized for large numbers of students at little further cost (Bateman et al., 2013) and are easy to administer compared to the resource intensive process of scheduling and training standardized patients, and provide known and consistent content for each student who views them. A study by Triola et al. (2006) showed little difference in the outcomes of virtual patients and standard patients in terms of post – encounter performance or perceived effectiveness of the experience by students.

**Tip #9: Consider faculty development**

Lack of understanding as to how to effectively utilize virtual patients within the curriculum can lead to low rates of adoption (Cook & Triola, 2009), and a suboptimal experience for students. When using virtual patient cases for teaching professionalism, this issue is compounded as, despite the recognition of the importance of teaching professionalism, faculty skills and comfort level with teaching professional skills is often low, and training on how to teach these areas are lacking (Cote & Laughrea, 2014; Cote & Leclere, 2000; Steinert et al., 2005). Dedicated “orientation” and training to the virtual patient environment as a teaching methodology as well as focused faculty development on teaching professionalism is an important consideration for successful integration of virtual patient cases into the professionalism curriculum.

**Tip #10: Provide adequate technical support**

Reliable online access has been identified as an important factor for acceptance of virtual patient methodology by students (Huwendiek et al., 2013). Although it is often assumed that most students have access to reliable and fast internet access and are computer literate, this may not always be the case; for example if virtual patient cases are utilized during clinical rotations where students are located in remote areas or in other situations where internet access is unreliable. Given that many professional issues arise during clinical placement for which the virtual patient cases might provide an excellent resource, this is problematic. The virtual patient cases themselves must be free of non-working links or other technological glitches which impede student experience and could add to their cognitive load (Chen et al., 2015). Support in terms of readily accessible "help lines" (for students and faculty) is important to optimize learning experience.

The production of cases also requires significant technological support (Huang et al., 2007) which is often outside the expertise of clinical and academic faculty (Cook & Triola, 2009). Liaison and support from educational designers and educational technologists for the design phase is a valuable asset.

**Tip #11: Encourage reflective practice**

Reflection on practice, including aspects of practice such as communication, advocacy and conflict resolution, is a necessary skill for health professionals and is an important part of lifelong learning for developing professional competencies and professional identity (Hodges et al., 2009; Jamissen & Skou et al., 2010; Mann et al., 2009; McKaige et al., 2011; Sandars, 2009). Building reflection exercises into virtual patient case is an effective way of practicing this skill, and can be completed as an individual task or as part of a small group discussion. Reflection on virtual patient cases can take place during or following completion of the case. When interacting with the case students can be asked to reflect on their choice of action, and asked to consider the consequences of other possible choices. This can be in the form of written comments or notes, by providing feedback on less favorable choices, or by targeted analysis of the decisions made (Posel et al., 2014). Examples of reflective questions for a virtual patient encounter focusing on communication with a hostile patient might include, "If you had acknowledged the patients anger at the start of the scenario, how might the outcome have changed and why? What factors did you consider when you chose option A as your preferred response? Which of the following responses would be most likely to defuse the patients anger and why?" The post case debrief also provides opportunities for reflection (see tip #4).

**Tip #12: Incorporate feedback**
As with any educational tool, feedback is important to promote learning in virtual patients (Posel et al., 2014), and has been shown to be important in the development of professionalism (Brinkman et al., 2007; Stark et al., 2008) as well as to encourage greater depth of reflection (Sandars, 2009). When well designed, virtual patient cases lend themselves well to providing immediate feedback as the learner completes the case, where the outcomes of incorrect or less positive choices can be described and fed back both during the case and on completion. Post-case debrief /discussion (see Tip #4) and using the virtual patient cases for group discussion (see Tip #2) also provide opportunities for feedback on both the learner choices and the reasoning leading to those choices, as does using the virtual patient cases for assessment (see Tip #7). When used for interprofessional study, feedback on student choices from other team members may be particularly effective in providing alternative viewpoints and perspectives.

Conclusion

Virtual patients are a useful strategy to consider in teaching professionalism which is considered one of the most complex constructs of medical education. This paper suggests twelve tips for utilizing virtual patients to teach professionalism curriculum. These tips are summarized as building clinical virtual scenarios into the cases such as obtaining consent for a surgical procedure; developing social interaction and teamwork; knowing when to use virtual patient cases; debrief the cases; watch for the informal curriculum; consider the educational level of the learner; use virtual patients for assessments; consider cost-effectiveness and faculty development; provide adequate technical support; encourage reflective practice; and incorporate feedback. Careful integration of these tips may provide the medical educators with a framework of teaching professionalism using virtual patients and may facilitate students’ learning experience and the retention of their learning.

Take Home Messages

Notes On Contributors

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Appendices

Declaration of Interest

The author has declared that there are no conflicts of interest.