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Use of virtual clinical simulation to improve communication skills of baccalaureate nursing students: A pilot study☆,☆☆

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SUMMARY

Background: According to The Joint Commission (2012), the leading cause of sentinel events in the United States was miscommunication. Lack of thorough and accurate communication remains a serious challenge in healthcare and an educational priority in schools of nursing. Virtual clinical simulation is an online educational approach where students use avatars to practice various skills.
Objectives: The purpose of this pilot study was to evaluate the educational innovation of using virtual clinical simulation to improve communication skills of BSN students. The objectives of the simulations were to 1) recognize significant patient data and 2) accurately perform the ISBAR communication technique.
Design: The study used a within-group, time-series design with eight students. Students participated in two synchronous virtual simulations in an online virtual clinical environment called CliniSpace™. Students performed in groups of four to five students.
Methods: Students performed in two virtual simulations in groups of four to five students. Student performances were scored by two raters using the CliniSpace™ ISBAR Rating Sheet. Field notes from debriefing sessions were analyzed for content.
Results: Mean group student performance scores more than doubled from performance one to performance two. This change was found to be statistically significant, $p < .001$. Field notes revealed that students listened to how their peers communicated and learned from them. Students expressed having less anxiety, knowing what to expect, and having "better flow" with communication. Students verbalized learning to assess the patient prior to calling the physician and to give a recommendation to the physician.
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Introduction

According to The Joint Commission (TJC), 1243 sentinel events were reported in the United States between 2004 and 2011 (The Joint Commission, 2012). Communication was identified as the root cause in 61% of the most frequently identified causes (The Joint Commission, 2012). A 2013 United States Hospital National Patient Safety Goal is to "Improve the effectiveness of communication among caregivers" (The Joint Commission, 2013, p. 2). Lack of thorough and accurate communication remains a serious challenge in healthcare and an educational priority in schools of nursing and health professions.

The United Kingdom Department of Health (DOH) stated that "improving patient safety involves assessing how patients could be harmed, preventing or managing risks, reporting and analysing incidents, learning from such incidents and implementing solutions to minimise the likelihood of them reoccurring" (Department of Health, 2012, para. 1). In reference to the occurrence of medication errors, "Insufficient knowledge can be due to a failing of an individual … but it can also be due to a system failure, such as failure by school or hospital authorities to prepare staff adequately to fulfill their responsibilities" (Lu et al., 2013, p. 25). Because medication errors and sentinel events have been linked to miscommunication and lack of education, the authors decided to evaluate the effectiveness of using virtual simulation to teach communication skills to baccalaureate nursing (BSN) students.

Background

In 2001, the United States Institute of Medicine (IOM) proposed ten rules in the redesign of healthcare delivery systems. The tenth rule was

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direction for "Cooperation among Clinicians," emphasizing collaboration and communication to ensure an appropriate exchange of information (Institute of Medicine, 2001, p. 9.). Healthcare organizations were directed to improve teamwork by using a standardized approach to hand off communications (Kesten, 2011). Originally developed by the United States military to decrease errors in high-risk military operations (Mahlmeister, 2005), the SBAR communication technique was proposed as a framework applicable to healthcare as well. The SBAR method of communication addresses four key facets of effective communication: situation (S), background (B), assessment (A), and recommendation (R). With time, the SBAR framework evolved to include starting communications by stating one's identity or identification (I) to become what is known now as the ISBAR method.

Leading healthcare organizations throughout the world are endorsing the ISBAR method as the standard (Australian Commission for Safety and Quality in Health Care, 2012; Quality and Safety Education for Nurses, 2012; World Health Organization, 2013). The World Health Organization (WHO) recommends ISBAR as an effective communication model for medical students and includes direction to teach the skill of communication within the Patient Safety Curriculum (World Health Organization, 2013). The Australian Commission on Safety and Quality in Health Care (ACSQHC) supports ISBAR to promote effective handover in interhospital transfers (Australian Commission for Safety and Quality in Health Care, 2012). Quality and Safety Education for Nurses (QSEN) recommends SBAR as a framework to teach inter- and intradisciplinary communication skills (Quality and Safety Education for Nurses, 2012). Interprofessional collaboration and education are important (Leape et al., 2009), and ISBAR provides a mutually understood, consistent framework to promote communication exchange among disciplines as well as a foundation for educators to structure teaching activities.

The IOM Future of Nursing Report: Leading Change Advancing Health recommends the use of high-fidelity simulation technologies as a means of providing clinical experience to nursing students (Institute of Medicine, 2010). Virtual clinical simulation (VCS) as described in this article, is a synchronous, multiperson, online 3D immersive training environment that can expose students to the challenges of nursing practice in a safe, engaging, dynamic, accessible, and situated environment. Among VCS technologies, the CliniSpace™ platform offers a high-fidelity environment that is user-friendly, refined for health professions, and well suited to authentically replicate a clinical setting (Fig. 1). The environment has been specifically designed for nurse education and provides an environment that may be manipulated by faculty. VCS within the CliniSpace environment occurs using live dialog that allows for real-time or synchronous communication. Virtual patients respond appropriately to verbal interactions role played by the facilitator. Similar to mannequin-based simulation, virtual patients respond physiologically to clinical interventions. Changes in vital signs and general appearance change as computer settings are modified by the faculty member.

According to Allen and Seaman (2013), online enrollment in higher education in the United States has been steadily increasing for the last ten years. There are many reasons for this movement including student convenience, advancing technology, changing student demographics, and learning preferences. Virtual clinical simulation, based on tenets of social and experiential learning theory, may be a promising pedagogy of the future. With VCS, students and faculty are able to participate in live clinical simulations from the comfort of their homes. VCS spans boundaries and allows students of various disciplines and locations to participate together virtually. Despite the potential of this innovative and engaging online learning approach for nurse education, there is limited research on the effectiveness of VCS for improving clinical skills such as communication. There are no published research studies on the effectiveness of CliniSpace in nursing education.

Three educational studies describe the use of virtual clinical simulations, other than CliniSpace, with nursing students (Aebersold et al., 2011; Broom et al., 2009; McCallum et al., 2011). The simulations resulted in both positive and negative feedback from students. The advantages of the virtual simulations for students included developing knowledge and helping with clinical practice (Broom et al., 2009); improving decision-making and learning (McCallum et al., 2011); being "better than or as good as [mannequin-based] SimMan®"; and serving as an effective system for practice of skills (Aebersold et al., 2011, p. e5). The negative elements related to virtual simulation included delays related to technical issues (Aebersold et al., 2011; Broom et al., 2009), students wanting more involvement in choosing their avatars (Aebersold et al., 2011), delays and restrictions due to text-chat (Aebersold et al., 2011; McCallum et al., 2011), and students rationalizing that "they are not the real thing" (Broom et al., 2009).

Jeffries' (2005) Simulation Model served as the conceptual framework of this study. According to Jeffries (2005), this framework provides a context for relating the likely variables in simulations. The major components, Teacher, Student, Educational Practices, and Design Characteristics and Simulation, are proposed to influence Outcomes. The Outcomes "are proposed to be influenced by the degree to which best practices in education are incorporated in the design and implementation of the simulations" (p. 97). Student outcomes include learning, skill performance, learner satisfaction, critical thinking, and self-confidence (p. 97). The use of this framework guided the evaluation methods of this study, specifically, investigating the outcomes of learning and skill performance.

The purpose of this study was to evaluate the use of VCS to improve communication skills of baccalaureate nursing students. The aim of the

Fig. 1. Image from CliniSpace™.
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