Literature Synthesis on Evaluative Measures in Healthcare Simulation

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ABSTRACT

Whereas most educators have a good grasp on the history of simulation in healthcare, the current state and types of modalities related to simulation in healthcare education, and the future direction of healthcare simulation, many educators do not have an in-depth understanding of the metrics available to assess the use of simulation. The purpose of this literature synthesis is to build a repository of the metrics being used to evaluate nursing and healthcare provider simulation. Additionally, the level of fidelity and desired learning domains that the matrices purport to evaluate is examined. A secondary purpose of the literature synthesis is to determine if a suitable metric is available that can be used universally to evaluate nursing and healthcare related simulations. Finally, conceptual frameworks suitable for serving as the bases of instrument development related to nursing and health care simulation are explored. Primary studies, meta-analyses, and systematic reviews that discussed or evaluated metrics used to measure outcomes of simulation were analyzed. Recent articles, published within the last five years, which discussed the evaluation of nursing and or healthcare simulation, were eligible for inclusion. Additionally, descriptive, inferential, qualitative, and quantitative studies were eligible for inclusion.

Keywords: Evaluation Instruments, Health Care, Literature Synthesis, Metrics, Nursing Education, Simulation

INTRODUCTION

Simulation in healthcare and healthcare education has gained a foothold as one of the preferred alternative educational modalities for current and future healthcare providers. Institutions of higher education and patient based hospitals and clinics are incorporating healthcare simulation to increase the knowledge, skills, and attitudes of current and future healthcare providers. The practice of using simulation to train healthcare providers is not a new phenomenon. Low fidelity simulation has been used in healthcare for as long as healthcare has been around. For instance using an orange as an injection pillow is a form of simulation that has been used in nursing education for over a century (Ziv, Wolpe, Small, & Glick, 2003).

BACKGROUND

Whereas, most educators have good grasp on the history of simulation in healthcare, the current state and types of modalities related to simulation in healthcare education, and the
future direction of healthcare simulation. Many educators do not have an in-depth understanding of the metrics available to assess the use of simulation. The purpose of this literature synthesis is to build a repository of the metrics being used to evaluate nursing and healthcare provider simulation. Additionally, the level of fidelity and desired learning domains that the matrices purport to evaluate will be examined.

A secondary purpose of the literature synthesis is to determine if there is a suitable metric available that can be used universally to evaluate nursing and healthcare related simulations. Finally, conceptual frameworks suitable for serving as the bases of instrument development related to nursing and or healthcare simulation will be explored.

Simulation is defined by Merriam-Webster dictionary (“Simulation”, 2012) as the imitative representation of the functioning of one system or process by means of the functioning of another. Types of simulation that are commonly used in nursing and healthcare education include case studies, role playing, low fidelity, medium fidelity, and high fidelity simulations. For this literature synthesis the author included articles that discussed low fidelity simulators, medium fidelity simulators, and high fidelity simulators.

Low fidelity simulators include simple task trainers that replicate human anatomy, which also provide physiological or behavioral feedback to intervention. A common example of a low fidelity simulator is Seymour Butts, a wound care simulator. Medium fidelity simulators replicate the whole human body and give limited physiological or behavioral feedback. Common examples of a medium fidelity simulator include Vital Anne a vital sign simulator manufactured by Laerdal. Vital Anne has adjustable heart sounds, lungs sounds, vital signs, and limited verbal response to interventions such as gagging or coughing. High fidelity simulators mimic real humans from an anatomical perspective and a physiological and behavioral perspective. Well know high fidelity simulators include METI Man and Sim Man. Both of these Human Patient Simulators (HPS) respond to interventions as human would respond (Grady, 2009).

The use of simulation, as a teaching strategy, is rapidly expanding and recognized as a method to improve outcomes in a complex health environment. Simulation allows students and healthcare providers’ opportunities to explore and develop skills, knowledge, understanding, and clinical judgments. Simulated settings provide a safe environment for the practice of situations that occur in unique and rare instances.

The Standards for Best Practice in Simulation (INASCL, 2011) note that use of simulation experiences can provide meaningful evaluation of the three domains of learning—cognitive, affective and psychomotor. The cognitive domain is further delineated into content knowledge and clinical reasoning. Since simulation is often used in conjunction with or in substitution of clinical experiences, instruments are needed that are reliable and valid in measuring all three domains. According to Kardong-Edgren, Adamson, and Fitzgerald (2010, p. e28), “evaluative instruments ideally should include some measures for each of the three domains of student performance: cognitive, psychomotor, and affective. An instrument, measuring any one of these alone will not be accurate in evaluating overall performance”.

PURPOSE

The purpose of this literature synthesis is to build a repository of the metrics being used to evaluate nursing and healthcare provider simulation. Additionally, the level of fidelity and desired learning domains that the matrices purport to evaluate will be examined. A secondary purpose of the literature synthesis is determine if there is a suitable metric available that can be used universally to evaluate nursing and or healthcare related simulations. Finally, conceptual frameworks suitable for serving as the basis of instrument development related to nursing and healthcare simulation will be explored.
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