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Development of a simulation evaluation tool for assessing nursing students' clinical judgment in caring for children with dehydration

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SUMMARY

Background: The lack of reliable and valid tools to evaluate learning outcomes during simulations has limited the adoption and progress of simulation-based nursing education.
Purposes: This study had two aims: (a) to develop a simulation evaluation tool ($SET^{c\text{-}dehydration}$) to assess students' clinical judgment in caring for children with dehydration based on the Lasater Clinical Judgment Rubric (LCJR) and (b) to examine its reliability and validity.
Participants: Undergraduate nursing students from two nursing schools in South Korea participated in this study from March 3 through June 10, 2014.
Methods: The $SET^{c\text{-}dehydration}$ was developed, and 120 nursing students' clinical judgment was evaluated. Descriptive statistics, Cronbach's alpha, Cohen's kappa coefficient, and confirmatory factor analysis (CFA) were used to analyze the data.
Results: A 41-item version of the $SET^{c\text{-}dehydration}$ with three subscales was developed. Cohen's kappa (measuring inter-observer reliability) of the sessions ranged from .73 to .95, and Cronbach's alpha was .87. The mean total rating of the $SET^{c\text{-}dehydration}$ by the instructors was 1.92 (±.25), and the mean scores for the four LCJR dimensions of clinical judgment were as follows: noticing (1.74 ± .27), interpreting (1.85 ± .43), responding (2.17 ± .32), and reflecting (1.79 ± .35). CFA, which was performed to test construct validity, showed that the four dimensions of the $SET^{c\text{-}dehydration}$ was an appropriate framework.
Conclusion: The $SET^{c\text{-}dehydration}$ provides a means to evaluate clinical judgment in simulation education. Its reliability and validity should be examined further.

Introduction

Background

The nursing education environment has evolved rapidly over the past 20 years (Gubrud-Howe, 2008). Owing to advances in technology, high-fidelity simulation (HFS) using computer-controlled simulated patients has opened new frontiers in nursing education. HFS has been shown to improve not only skills but also critical thinking and clinical judgment (Yuan et al., 2014). Clinical judgment of the nurse is defined as interpreting and reaching a conclusion about a patient's situation and deciding to intervene in the patient's problem (Lasater, 2007a; Yuan et al., 2014). Tanner (2006) defined clinical judgment as an interpretation or conclusion about a patient's needs, concerns, or health problems.

The Lasater Clinical Judgment Rubric (LCJR), based on Tanner's (2006) work, contains four dimensions of clinical judgment: noticing, interpreting, responding, and reflecting. The LCJR serves as a framework for assessing students' clinical judgment in each of these dimensions. The dimensions of the LCJR provide nursing educators with a logical progression framework to formulate questions that prompt nursing students to think about each of the rubric's dimensions, link what they observe to what they know from theory or their background before they intervene, and reflect on the effectiveness of their judgment. The LCJR also provides valuable feedback for nursing educators and preceptors by showing students' progress toward attaining higher levels of expertise in clinical judgment (Lasater, 2007a). An additional advantage of the LCJR is that the rubrics can foster the direct development of clinical judgment (Stevens and Levi, 2005).

In today's clinical environment, many children with acute diseases are cared for in outpatient departments. Consequently, nursing students

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have fewer opportunities to care for children with acute diseases in pediatric care units. Moreover, as children's health conditions can deteriorate rapidly, nursing students must acquire sound clinical judgment so that they can provide timely and appropriate care for children.

Dehydration is a health problem caused by a loss of water and extracellular fluid. In children, it is often a result of common gastrointestinal infections resulting in children's visit to clinics or hospitalization. As a large portion of a child's total body fluid is extracellular compared to that of an adult; thus, children are more susceptible to dehydration (Potts and Mandleco, 2011). Moreover, dehydration caused by vomiting and diarrhea can lead to electrolyte imbalance, malnutrition, hypovolemic shock, and even death. Therefore, children with dehydration should be cared for by treating the underlying cause of the dehydration and correcting the fluid and electrolyte deficits, based on the degree of dehydration (Potts and Mandleco, 2011). Thus, the clinical judgment of nursing students who are exposed to such cases should be evaluated.

Simulation is an increasingly attractive educational alternative, especially in the pediatric setting. However, reliable and valid instruments are needed to measure the clinical judgment of nursing students in a simulation environment. The lack of such tools may limit the adoption and progress of simulation-based nursing education (Kardong-Edgren et al., 2010). Researchers and institutions of nursing are in the process of developing appropriate tools for evaluating HFS and the clinical judgment demonstrated by students during HFS. Instruments that measure learning outcomes can be used for a comprehensive evaluation of knowledge, skills, and attitudes related to clinical judgment (Kardong-Edgren et al., 2010). Nurse educators and clinical preceptors play an important role in promoting learning and in evaluating the skills and competencies needed by nursing students, including clinical judgment.

In this study, we propose an effective measurement tool for nursing students to promote improvement in their clinical judgment in caring for children with dehydration.

Purpose

The purpose of this study is (a) to develop a simulation evaluation tool (SET$^{c\text{-dehydration}}$) for assessing clinical judgment in caring for children with dehydration, based on the LCJR, and (b) to examine its reliability and validity. The ultimate goal is to provide a basis for an evaluation tool to test clinical judgment in HFS scenarios.

Methods

Design

The SET$^{c\text{-dehydration}}$, which is based on the LCJR, was developed considering nurses' learning objectives while caring for children with dehydration (Fig. 1).

Participants

The participants were 120 junior and senior undergraduate nursing students on their pediatric nursing rotation; they were recruited from two universities located in Seoul, South Korea. The sample was homogeneous with regard to gender, age, and type of program in which they were enrolled. There were 109 women (90.8%) and 11 men (9.2%), a distribution typical of the overall undergraduate nursing student population. The mean age of the participants was 20.5 years, with a very limited age range of 20 to 21 years. This study was conducted in HFS laboratory, a space specifically designed to replicate a pediatric ward.

Procedures for Developing the SET$^{c\text{-dehydration}}$

Content Composition

The first stage in developing the SET$^{c\text{-dehydration}}$ was to identify guidelines on caring for children with dehydration by means of a literature review of pediatric nursing textbooks and child health journals. We also established learning objectives and identified the elements of clinical judgment that are important when caring for children with dehydration, according to the LCJR dimensions of noticing, interpreting, responding, and reflecting (Lasater, 2007a).

The learning objectives were as follows:

- Understand the mechanism of fluid/electrolyte balance
- Assess the signs/symptoms of fluid/electrolyte imbalance
- Provide nursing care for children with fluid/electrolyte imbalance, and
- Apply the nursing process to children with dehydration

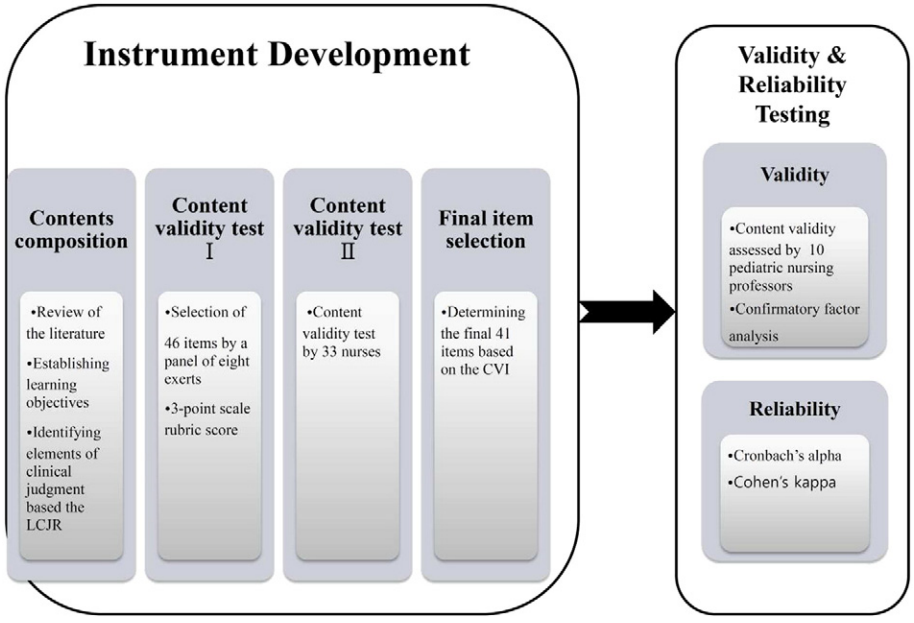

Fig. 1. The process of SET$^{c\text{-dehydration}}$ development and testing. *SET$^{c\text{-dehydration}}$: simulation evaluation tool of caring for children with dehydration; LCJR: Lasater Clinical Judgment Rubric; CVI: Content validity index.