CONCEPT-BASED LEARNING AND ENHANCEMENT OF METACOGNITION IN NURSING EDUCATION

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ABSTRACT

A concept-based curriculum uses overall principles with broad perspectives and applies them to relevant scenarios. In contrast to content-focused instruction, these broader-based concepts can have wide-reaching applicability. Concept-based attributes such as problem-solving, analysis, mapping, and critical thinking can reinforce metacognitive skills and promote higher-order thinking. These constructs are of particular importance to the provision of quality nursing care.

A review of the literature was conducted to explore concept-based learning and how it informs metacognition in nursing education. Further experience, research and faculty education is needed to demonstrate the success of content-based learning, its influence on metacognitive development, and, most importantly, its promise to ensure safe, high quality patient care.

Key words: *metacognition, metacognition and nursing practice, concept-based education, concept-based teaching in nursing*

INTRODUCTION

Nursing is a profession operating in a complex system, requiring in-depth knowledge, clinical skills, and higher-order thinking. According to the American Association of Colleges of Nursing (2017), the practice of nursing requires analytical, critical thinking, scientific reasoning, and the ability to apply knowledge. Nursing scholars and leaders recommend that nursing education be re-made to include an emphasis on multiple ways of knowing, thinking, and the application of active constructivist methodologies (Chiejina & Ebenebe, 2013; Benner, Stephen,

Leonard, & Day, 2010). Such educational constructs represent metacognitive assumptions that can be developed and/or expanded using concept-based learning strategies (Giddens, 2017; Gubrud, 2016; Josephsen, 2014).

CONCEPT BASED LEARNING

Erickson (2012) described concept-based learning in terms of using universal tenets, overarching principles, and generalizations as starting points for

the development of themes, issues and factual knowledge. Concepts are described as unifying and framing these principles and themes in order to create a learning environment that promotes deeper thinking (Giddens, 2017; Giddens & Brady, 2007). Paul and Elder (2014) identified the importance of focusing on concepts that are powerful, generalizable, and lead to solutions for real problems (p. 45).

Concept-based learning encourages the student to look beyond mere facts and asserts that content should no longer be the primary focus of teaching (Brody, 2004). Concept-based learning has been adopted as a strategy to promote higher-order thinking in primary, secondary, and college level education (Walker, 2014; West, 2016; Paul & Elder, 2014,). For example, Walker described concept-based inquiry in a high school art classroom. Students received either traditional teaching focused on technique, or a concept-based artmaking approach that emphasized freedom of thinking and problem-solving. Students in the content-based approach described "profound and self-reflective insights" that had the potential to expand their critical thinking beyond just art education (p.13).

Some aspects of concept-based learning described by scholars, researchers, and teachers, is its relation to problem-based learning and inquiry-based learning. Blessinger and Carfora (2014) maintained that inquiry-based learning promotes a student-centered experience that prepares students to be lifelong learners by tapping into and developing higher-order skills.

Inquiry emerges as a tool that is both stimulating and cognitively enriching. Thus, inquiry becomes a byproduct or tool of concept- based learning. Hess, Jones, Carlock, and Walkup (2009) conducted a teacher workgroup to create enhanced Bloom's taxonomy levels that included very robust inquiry and problem-solving thought processes. Similarly, problem-based learning is also about asking questions and encouraging deep thinking. Like concept-based learning, it emphasizes knowledge development rather than rote content and memorization (Durwin & Reese-Weber, 2018). Oguz-Unver and Arabacioglu (2014) performed a literature review comparing inquiry and problem-based learning and concluded that both required carefully considered, deep thinking through analyzing scenarios and applying real-world applications.

The authors discussed the importance of presenting central concepts and principles of disciplines, as opposed to content-learning only.

CONCEPT-BASED LEARNING IN NURSING EDUCATION

The best and most effective ways to prepare student nurses for delivering care that is safe and demonstrates best practice has been somewhat of a conundrum for educators, researchers, and nurse leaders. Heims and Boyd (1990) introduced concept-based learning activities for clinical nursing education. A 2003 Institute of Medicine study examined health profession education and concluded

that nursing curricula was "crowded" with content (p. 38). According to Scheckel (2016) and Giddens (2007), the voluminous amount of content in traditional nursing curricula lent itself to fragmented, instructor-centric, passive learning. Little time for questions, clarifications, or discussion was available (Scheckel, p.165). Didactic and even clinical experiences were not completely effective in promoting deep and critical thinking (August-Brady, 2007). Essentially, this resulting content saturation (Giddens & Brady, 2007) had the effect of fragmenting the big picture into learning of facts, without adequate attention to broader concepts (All & Huyeke, 2007). Such content-focused teaching did not encourage critical thinking, a characteristic defined as necessary for nursing practice (All & Huyeke, 2007; Cooper, 2014; Gubrud, 2016).

Nursing leaders and scholars recognized this gap, and looked at more modern alternatives for education. With its emphasis on moving from general, universal principles to applications in commonly encountered situations and experiences in clinical practice, concept-based instruction represented a potential new learning construct. The American Association of Colleges of Nursing Fact Sheet on Education in Nursing Practice (2017), identified the call for nurses with critical thinking, leadership, and knowledge application skills across a broad representation of settings.

Simply stated, metacognition is defined as "students reflecting on what they have learned, how they learned it, and why it is important" (Sullivan, 2016, p. 112). In talking about medical students, Driessen (2014) described metacognition as including study skills, self-regulation, and acquiring knowledge. He also included the ability to monitor one's own deficiencies and understanding. Metacognition is thought to foster long-term hypercognition and assist in organizing excessive information through self-oriented processes (Kazi, Makris, & Demetrious, 2008). Brady (2004) described the melding of concepts and metacognition in his article on conceptual frame-working and the process of study. He spoke of the layout of the mind with respect to knowledge and the need for students to thoroughly understand conceptual frameworks. He contended that both integration of concepts and knowledge and using ones "mental filing system" was paramount to developing hard-edged, comprehensive, useful and enduring intellect (p. 278).

The literature shows a number of scholarly articles on metacognition as it relates to nursing education. Early research on the value and necessity of metacognitive constructs suggested that nursing educators become familiar with metacognition and recognize its importance. Worrell (1990) compared it to preventive health care, in that it "prevents" learning gaps and fosters continuing high-level learning, thinking, and application of knowledge (Worrell, 1990). Concept-based learning activities are suggested as a way to develop critical thinking and explore the student's own deep learning connections (Gubrud, 2016). Thus, it may be stated that concept-based learning does inform metacognition.

Knowledge, self-monitoring, and self-regulation are essential for all learning environments and professions. In the health professions, the need for becoming a better learner in order to become a better clinician, becomes particularly important (Medina, Castleberry, & Persky, 2017). Medina, et al., went on to cite the philosophy of professional healthcare organizations that learning must be lifelong, and requires self-direction and self-regulation. They discussed the importance of self-directed learning and its relation to critical thinking. The authors suggested cognitive apprenticeships as vehicles for learning through guided experiences including concepts, facts, procedures, and strategic knowledge (p. 4).

Brady's description of concepts and knowledge management as previously described, can be seen in the methodologies and theories used in concept-based learning in nursing education (2004). For example, West (2016) used a concept-based model for teaching nursing ethics. Rather than applying content alone in separate topics such as ethical theory, or a standalone clinical area, it was introduced as a broad concept that was integrated with other therapeutic modalities such as medicine, physical therapy, and social work. Student learning was driven through deep analysis of case studies, self-examination of thought processes regarding personal decision making, and intense discussion (p. 124). Of note, the concept-based learning in this example did not preclude the need for actual topical content and skills education and practice.

The difference between this and traditional lecture and practice teaching, was that content and skills were utilized as tools rather than the predominant methodology. In this example, the educators' goals were not only imparting information, but to move students to a level of higher-order reasoning. Ironically, by using a concept-based approach proceeding from the general to the more specific elements of ethics, students were able to actually practice ethics as a skill, rather than an esoteric, nebulous thought process (West, 2016). This example clearly demonstrates how concept-based learning can both tap into and enhance metacognitive self-mastery and practice skills.

PRACTICAL APPLICATIONS

With its general approach, a concept-based curriculum for nursing education seems at first to be in almost diametrical opposition to learning the specific clinical, informational and skill requirements needed for practice. Conversely, however, learners continue to apply new knowledge, within the concept itself. This creates an enriched environment that stimulates the learner's experience and allows progressively advanced interactions with patients in real-life clinical practicums (Bristol & Rosati, 2013; Iwasiw & Goldenberg, 2015; Nielson, 2009). At the Oregon Health and Science University, School of Nursing, Lasater and Nielson (2008) conducted a study in which they compared the clinical experience of

students in a concept-based versus a traditional total patient care model. The traditional model was no longer working effectively, as patient turnover was increasing due to shorter lengths of stay. Additionally, there was increasing patient complexity associated with high-acuity, so students were becoming task oriented to a point where critical thinking and the development of clinical judgment were suffering (p. 441). Students were assigned to either the Clinical Judgment Model (concept-based) or an acute care nursing course with no concept-based learning activities (control group).

A quasi-experimental design was employed, with the "treatment" represented in the concept-based group as exposure to two, three, or four concept-based learning activities. The clinical experience for the treatment group involved a morning patient-assignment, afternoon nursing rounds, and a clinical judgment study guide. Faculty were onsite to assign patients and serve as advisors. The control group experienced the usual clinical practicum in adult nursing care and received the usual didactic content-focused classroom teaching. Using focus groups and a clinical judgment rubric, cognitive and practical application of knowledge and skills were evaluated. The treatment group scored statistically significantly higher in all four phases of measured clinical judgment and total judgment (p. 444). Results also demonstrated that concept-based learning activities guided students' clinical thinking and connected theory with practice, thereby promoting applicability to future patient care scenarios. (p. 446). The expanded thinking, analysis, and usefulness for future practice also demonstrated metacognitive elements.

In 2012 Whitireia, a New Zealand college, developed a new nursing curriculum that went beyond the Oregon model just described. Whitireia determined that it was imperative to meet the nursing profession's recommendations to go even further with concept-based education (McGrath, 2015). The college felt that although the Oregon model was progressive and innovative, it primarily focused on how best to provide clinical experience and learning. The curriculum was completely revamped, using Fink's 2007 taxonomy of significant learning that incorporated integration of the following: foundational knowledge, application and integration of knowledge, a human dimension, caring and learning how to learn. (p. 13). Whitireia used domains to organize concepts according to the philosophy and values of the school's program.

As an example, some of the concepts for year one students included professional practice, professional identity, and sociology. These concepts represented a focus on fundamentals of nursing (p. 15). Evaluation of this curriculum for year one students demonstrated, from the faculty perspective, that students were challenged to think and integrate knowledge more frequently. To evaluate students, small group discussions were used to record comments about the new curriculum. Students felt that it was easier to link theory to practice and

concepts tied content together. Suggestions for improvement included improving clarity of concepts for the professional nursing topic and the need for more time with some of the concepts (pp. 15 & 16).

The nursing literature and professional texts discussed several common learning strategies to promote self-learning, analysis, higher-order thinking, critical thinking, knowledge expansion, and metacognition. All of these strategies can be incorporated into a concept-based curriculum. Two of the most frequently mentioned are concept mapping and case studies.

Concept maps can be done either individually or as a group and include, but are not limited to, a concept itself, an illness, a problem, a construct, or an individual patient situation (Herrman, 2016; Jaafarpour, Aazami, & Mozafari, 2016). A concept-map literally maps out connections between a central theme and develops linkages that ultimately create a critical-thinking exercise that expands academic and cognitive knowledge. One study compared students receiving a learning experience that incorporated concept mapping with students receiving traditional instruction. The concept mapping group received higher marks on cumulative tests compared to the group receiving traditional instruction (Jaafarpour,2016). All and Huycke (2007) identified concept maps as tools for fostering a more complete and in-depth understanding of nursing theory focusing on concept analysis. Learning thus becomes student oriented and metacognitive processes are enhanced. Using serial concept maps enhanced concept-based learning by continuing to expand the students' reflection, perceptions, integrated knowledge and assimilation of new data (All & Huycke, 2007, p. 220).

Gubrud (2016) suggested using case studies in the clinical domain with comprehensive discussions that contributed to the development of deeper learning, critical thinking, and pattern recognition. Clinical exercises can become part of concept-based learning (p. 296). Case studies can be in the form of specific clinical scenarios or even professional exemplars such as ethical situations (Hermann, 2016).

Unfolding or continuing case studies stimulate metacognitive knowledge retention and recall (Phillips, 2016, p. 256). Unfolding case studies continue throughout a particular overarching concept, with evolving changes and/or additions made to stimulate ongoing deeper analysis, problem-solving and application to other cases (Hermann, 2016). Popile (2011), suggested that case studies engaged students in deep and insightful thinking that not only improved critical thinking skills, but resulted in identifying several solutions to problem scenarios. Such expansion in thinking contributes to general applicability, an important component of concept-based learning.

SUMMARY AND RECOMMENDATIONS

The applicability of concept-based learning in nursing as a vehicle to enhance metacognitive skills was apparent in this literature review. Both the general education literature and the nursing specific literature described the same benefits of concept-based learning: using broad ideas that can have future usefulness for students, creating learning activities that serve to solidify learning and understanding, creating more efficient, less fragmented curricula, and reinforcement of current and future metacognition. Additionally, for nursing, concepts serve to combine and organize the plethora of complex clinical and didactic topics present in current healthcare delivery. The implementation of concept-based learning might even incorporate social technology to improve metacognitive thinking and clinical reasoning (Norris & Gimber, 2013). Perhaps where the literature fell short was in the area of exactly how to create a concept-based learning curriculum. For example, Gauthier and Lajoie (2013) expressed concern regarding whether or not faculty actually have a shared understanding of what constitutes competent concept reasoning performance by students (p. 579); thus making faculty evaluation less than standardized. As more and more schools choose to explore the innovative methodologies recommended by the nursing professional organizations, more training and preparation for nurse educators will hopefully follow.

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