The use of concept maps to evaluate critical thinking in the clinical setting

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Abstract Concept mapping is a teaching–learning strategy that can be used to evaluate a nursing student’s ability to critically think in the clinical setting. It has been used in disciplines other than nursing to allow the learner to visually reorganize and arrange information in a manner that promotes learning of concepts that interrelate.

There are various approaches that can be employed when developing a concept map; however, the end result is diagramming major concepts and associated data in a format that is logical to the learner. By having the students use information for patients they actually provide care for in the clinical setting, faculty can evaluate their ability to identify priority data and relationships between conditions and their associated care.

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1. Introduction

A learner’s success in nursing education programs includes understanding of complex concepts and their associated nursing care. Nursing students must demonstrate not only knowledge of these concepts but also the ability to apply them to actual patient situations. The ability to think critically and analyze complex situations is needed when providing nursing care for the intense psychological and physiological needs of today’s health care patient. Nursing is made up of large quantities of detailed information and knowledge. This information is presented in a short amount of time, which allows little opportunity for the student to make connections between these concepts. Students may have a difficult time seeing the whole picture when presented with a patient who has numerous diagnoses, a complex medical history, and comorbidities.

Novak and Gowin (1984) identified steps to describe how students learn. Students break vast amount of knowledge into small parts and then rearrange or reorder them into a format that makes sense to the learner. Learners then develop connections among these small subconcepts until knowledge is fully grasped. This strategy is applicable to nursing education where a large amount of information is presented and assimilated.

The use of concept mapping allows reorganization of information in a visual manner to promote critical thinking in the nursing student.

2. Learning environment

Typically, faculty in a nursing program are hampered by limited classroom interaction with students and feel
pressed to provide extensive information over a short amount of time. This can result in covering “needed” information in lecture/handout format. Students tend to memorize this information to be successful on tests and have little opportunity to apply it critically or in an actual patient setting. Students often arrive at class with little preparation if they anticipate that they will be provided with the information needed to achieve a passing grade. Little opportunity is available in the classroom setting to identify connections between concepts or interrelationships that are present.

By participating in the clinical component of a nursing course, students are given the opportunity to apply the information they have learned in the classroom to actual patient situations. It is necessary for nursing students to see the “big picture” of those they care for. These patients may have complex medical histories and multiple care needs. The conditions and their associated treatments often interact or result in complications, and students must understand how the relationships exist. Students are required to pull out previously learned and newly learned information and make connections and relationships. Simple memorization is not sufficient to promote the thorough understanding of these complex concepts used in the clinical care of patients.

3. Traditional methods

Historically, the development of traditional nursing care plans has been the method to evaluate students’ understanding of the care needs. Nursing care plans tend to be linear in fashion and are based on nursing process, often for a single problem. These care plans are typically rigid in format and neglect to identify interrelationships among concepts and treatments. Students often copy generic prepared care plans from various published nursing textbooks and neglect to see the specific factors that are significant for the patients they care for. This results in little development of critical thinking in the nursing student.

4. Critical thinking

Critical thinking has been identified as a necessary skill of new nursing graduates for many years. Critical thinking is the ability to inquire, think, and make informed decisions that are specific to a particular client.

Alfaro-LeFevre (2003) identified a set of indicators of critical thinking that reflect the cognitive, affective, and knowledge behaviors of this complex construct. Nursing faculty continually strive to promote the skill of inquiry in a

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Fig. 1  Sample concept map.
A necessary component of nursing education incorporates strategies to enhance learning and critical thinking in nursing.

5. Concept mapping

The use of concept maps may help bridge the gap between theory and application in the clinical setting. Wheeler and Collins (2003) found that the use of concept maps to link knowledge and practice was an effective means of improving critical thinking skills in baccalaureate nursing students. The learning strategy of using concept maps has been around for more than 20 years and used in many disciplines. Concept mapping is a method of organizing information schematically and showing relationships. Novak and Gowin (1984) identify concept maps as visual learning tools that represent and organize information and concepts and the identification of relationships between ideas. Ausubel, Novak, and Hanesian (1978) incorporated assimilation theory as the basis for concept mapping. Part of this concept includes meaningful theory as a method of identifying a process of incorporating new knowledge with existing knowledge and reordering of this knowledge until it becomes meaningful and useful for the learner.

The development of a concept map for use in the clinical setting begins with collection of data. These data may be retrieved from the patient’s medical record, interview, or actual physical assessment. The student then organizes major concepts on a piece of paper. These major concepts could be about nursing diagnoses or medical conditions. Other pertinent information is clustered around the major concepts. This additional information may be related assessment data, treatments, or collaborative problems. These may be grouped similarly by color coding or by the use of symbols. The student has the opportunity at this point to identify factors that may be found in more than one location on the map. This cues the student that nursing priority may be placed in these

| Table 1 | Clinical concept mapping (Associate Degree in Nursing Program, Kent State University, Ashtabula Campus) |
|__________|__________________________________________________________________________________________|
| **What it is:** | Clinical concept maps are learning tools for student nurses. These aids help students understand relationships and promote critical thinking. |
| **Process:** | 1. Using your worksheet, obtain a thorough database (assessment data).  
2. Develop the map on an 11 × 17 sheet of paper. |
| **Step 1:** | Designate space to pertinent conditions  
The main diagnosis (the reason for hospitalization) should be central  
Other conditions should be grouped together (e.g., cardiovascular, respiratory, elimination) around the main diagnosis |
| **Step 2:** | Cluster data—clinical manifestations, diagnostics, therapeutics, and PCs around the appropriate conditions  
Identifies clinical ♠ manifestations or supporting assessment data  
Identifies diagnostics □ such as laboratory work, X-rays, etc.  
Identifies therapeutics ○ such as medications, treatments, and collaborations  
Identifies ○ (potential complications) |
| **Step 3: The most important!** | Link concepts and explain relationships by drawing an arrow between all related components. EACH arrow should identify what the relationship is and include pathophysiology wherever present.  
Comments on arrows may include:  
Causes  
Side effect of  
Action _____ (e.g., why drug, Rx is used)  
Increases risk for  
Decreases risk for  
3. Color coding is very helpful.  
4. A nursing journal article will be submitted with the concept map. Important points will be highlighted. In addition, arrow comments will be highlighted from information obtained in the article on the map. |

| Table 2 | Benefits of concept maps for nursing students |
|__________|__________________________________________________________________________________________|
| • Provide a visual format to organize a client’s plan of care  
• Show relationships between diagnoses, assessment data, medical and nursing treatment, and associated rationale  
• Demonstrate understanding of theory and how it applies to practice  
• Identify interrelationships  
• Identify appropriate and unique plan of care for a particular client  
• Identify collaborative problems  
• Identify nursing priorities based on relationships |

| Table 3 | Concept map student survey results |
|__________|__________________________________________________________________________________________|
| Question | Group 1 responses | Group 2 responses |
|__________|________________|________________|
| Did you find the development of your concept map(s) helpful in understanding relationships between conditions? | 96% Yes | 94% Yes |
| Overall, have concept maps been helpful in improving your understanding of nursing care of the client? | 92% Yes | 89% Yes |

Note: Group 1 is composed of third-semester nursing students in an associate degree in nursing program (n = 28). Group 2 is composed of fourth-semester nursing students in an associate degree in nursing program (n = 35).
areas that appear in more than one location. The key to an effective concept map is found in the next step, which includes the links between the concepts. By having the student literally draw lines and identify the links between the concepts will allow visualization of the interrelationships that exist and promote critical thinking in the student. In addition, the student can write rationale on the links between the concepts, which promotes a greater understanding of the theory relationships that exist (Fig. 1). One method used in the associate degree in nursing program at Kent State University, Ashtabula Campus, can be found in Table 1.

Concept maps are an excellent teaching–learning method to help the visual/spatial learner understand difficult concepts and their interrelationships. The development of concept maps may be more logical to those who are creative and artistic. Color coding or the use of symbols and an associated key can be helpful to both the learner and the faculty when analyzing a concept map. Visual learning has been proven to be an effective teaching–learning strategy. It allows the learner to visually make connections and reorganize complex information in a meaningful way. When integrating new knowledge, the learner can visually map this and relate it to previously learned information and concepts. In addition, including rationale on the links between concepts allows improved understanding of the information being learned. Other names for concept maps include mind maps or idea maps. Ignatavius (2004) chose the term clinical correlation maps, which show interrelationships between medical diagnoses, nursing diagnoses, collaborative problems, assessment data, and interventions. Ignatavius identified the benefits of clinical correlation maps for nursing students (Table 2).

A survey of nursing students at Kent State University, Ashtabula Campus, revealed that students also find concept mapping useful to their learning in the clinical setting (Table 3). The students in this associate degree in nursing program begin using concept maps in the third semester during the medical–surgical clinical rotation. Two are required during this semester. In the final semester of the nursing program, one concept map is developed during the medical–surgical clinical experience.

Some authors such as Schuster (2002) suggest replacing traditional care plans with concept mapping in the clinical setting. The rationale for this is that traditional care plans are often completed retrospectively and focus on linear problems. Schuster (2003) identified that concept maps allow students to see relationships that exist in patients with multiple problems and also suggested that concept maps be completed prior to providing care to a patient in the clinical setting. This concept map can be presented before care is provided by the nursing student, which allows the faculty to evaluate the student’s understanding of the medical conditions, patient care needs, and associated nursing care.

The development of concept maps can be time consuming for some nursing students. It can be done freehand or developed using software such as that provided at www.inspiration.com, which is not specific to nursing, or Mosby’s Concept Map Creator (Giddens & Kennedy, 2005), which is specific to nursing. In addition, some medical–surgical textbooks also include software or online support for the development of concept maps.

6. Conclusion

The development of concept maps allows students to see how ideas are connected. It can be an effective teaching–learning strategy that allows a student to develop the ability to organize and group information in a meaningful way. In addition, concept mapping not only allows nursing faculty to evaluate the student’s understanding of the complex patient care needs and the interrelationships that exist but also promotes critical thinking in the clinical setting.

References


Additional resources


