

Use of Concept Maps in Nursing Education*

Hemşirelik Eğitiminde Kavram Haritaları Kullanımı

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 BİLGEN ARIKAN**

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ABSTRACT

Concept mapping is an important teaching and learning method that can help learners accurately acquire the information they need. A concept map connects how people learn with meaningful learning issues. In nursing, concept maps can be used as a method for combining practice and theory, case management, academic writing, and study skills of nursing students. It has been identified that the use of the concept maps in nursing education improves a student's sense of accomplishment, self-confidence, and the ability of developing critical thinking skills. In addition, this method allows students to more easily identify the subjects that they do not know and understand and has a positive effect on students' academic success. In nursing education, the use of concept maps is very beneficial, and more information to educators in this field is recommended. In this review, general information about concept maps, the structure and formation of concepts maps, and the importance of using concept maps in nursing education is mentioned.

Keywords: *Concept map; learning; nursing; nursing education; teaching.*

ÖZ

Kavram haritaları, öğrencinin gereksinim duyduğu bilgiyi doğru biçimde kazanmasına yardımcı olan önemli öğretim yöntemlerinden biridir. Kavram haritası, insanların nasıl öğrendikleri ile anlamlı öğrenme konuları arasında köprü kuran bir öğrenme ve öğretme stratejisidir. Hemşirelikte kavram haritaları uygulama ile teoriyi birleştirme, vaka yönetimi, akademik makale hazırlama ve hemşirelik öğrencilerinin ders çalışma tekniği olarak kullanılmaktadır. Hemşirelik öğrencilerinin kavram haritası öğretim yöntemi kullanımının, öğrencilerin eleştirel düşünme becerisi ve kendi başlarına kavram haritası yapma, başarma duygusu ve özgüveni artırdığı belirlenmiştir. Bunun yanında öğrencilerin bilmedikleri ve anlamadıkları konuları daha kolay belirleyebildikleri, konuları daha iyi anlayabildikleri ve akademik başarılarına olumlu etki ettiği saptanmıştır. Hemşirelik eğitiminde kavram haritalarının kullanımının oldukça yararlı olduğu görülmekte ve bu konuyla ilgili bilgi eksikliğinin tamamlanması gerekmektedir. Bu derlemede kavram haritaları ile ilgili genel bilgiler, hemşirelik eğitiminde kullanılan kavram haritalarının yapısı, kavram haritası oluşturma süreci ve hemşirelik eğitiminde kavram haritalarının kullanımının önemine değinilmiştir.

Anahtar kelimeler: *Kavram haritası; öğrenme; hemşirelik; hemşirelik eğitimi; öğretim.*

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Concept maps are one of the important teaching methods that help learners accurately acquire the information they need.⁽¹⁾ A concept map is a learning and teaching strategy which bridges between how people learn and meaningful learning issues.⁽²⁾ Concept mapping process consist of steps like preparation, generation of statements, structuring of statements, representation of statements, interpretation of maps and utilization. Concept maps can be in various forms (spider, hierarchical, flow charts etc.). There are some points to consider when creating a concept map.⁽³⁾

In nursing education, the use of concept map teaching method has begun to increase in the early 2000s.^(1,4) It has been found out that concept map teaching method used in nursing education had positive effects such as the students' critical thinking skills,^(5,6) academic success,⁽⁷⁾ nursing competence skills, knowledge and comprehension levels,^(7,8) student satisfaction⁽⁹⁾ and cognitive learning levels.^(10,11) This review emphasizes general information about concept maps, types of concept maps that used in nursing education, concept mapping formation process, and the importance of using concept maps in nursing education.

Concept Maps

Concept maps were developed by Novak and Gowin at Cornell University by grounding on Ausubel's Theory of Assimilation at the beginning of 1970's. The use of "meaningful learning" instead of memoration-based learning in teaching concepts, principles and thoughts is regarded as the objective in this theory and meaningful learning was explained by grounding on three basic principles:^(12,13)

- **Progressive Differentiation:** It is the association new knowledge from more general concepts to the ones with less coverage and organization of the concepts by following a hierarchical way.
- **Classification:** It is the creation of new meanings by learners adding the new knowledge safely into the previous knowledge within the cognitive structure.
- **Complementary Reconciliation:** It is the identification of similarities and differences between new and previous knowledge.

Ausubel's theory (1968) is based on Piaget's cognitive learning theory.⁽²⁾ Piaget states that knowledge acquisition is a continuous self-reconstruction process of an individual. According to Piaget, people are interacted with their environment. Interactions of individuals become meaningful according to their interests at that moment and realize learning by creating schemes and processing the knowledge. Schemes evolve in time and new ones are generated and behaviours of the individual become complicated and they adapt to the environment more easily.⁽¹⁴⁾

Novak ve Gowin (1998) defined the concept maps as linear tools which make connections concerning the situations and

concepts about a problem or subject and organize the information.⁽¹⁵⁾ It was also defined as a hierarchical map structure making a connection with words and propositions. Meaningful proposition, connecting words, cross links and relevant examples are in the components of concept maps. Concept maps are visual presentations which make individuals comprehend the determined phenomena.⁽¹⁶⁾

Concept maps are specific in that each individual presents the links about the selected material or situation.^(17,18) Concept maps can be in various forms. Some concept maps are basically analyzed as four types and also they have three customized types. When analyzed basically:⁽¹⁶⁾

- Spider maps are the ones which expand outward with sub-themes organized around the related factor.
- Hierarchical maps are the ones in which important information is given at the top of the map and information is organized according to the order of importance.
- Flow charts are the maps in which information is generated as flow schemes.

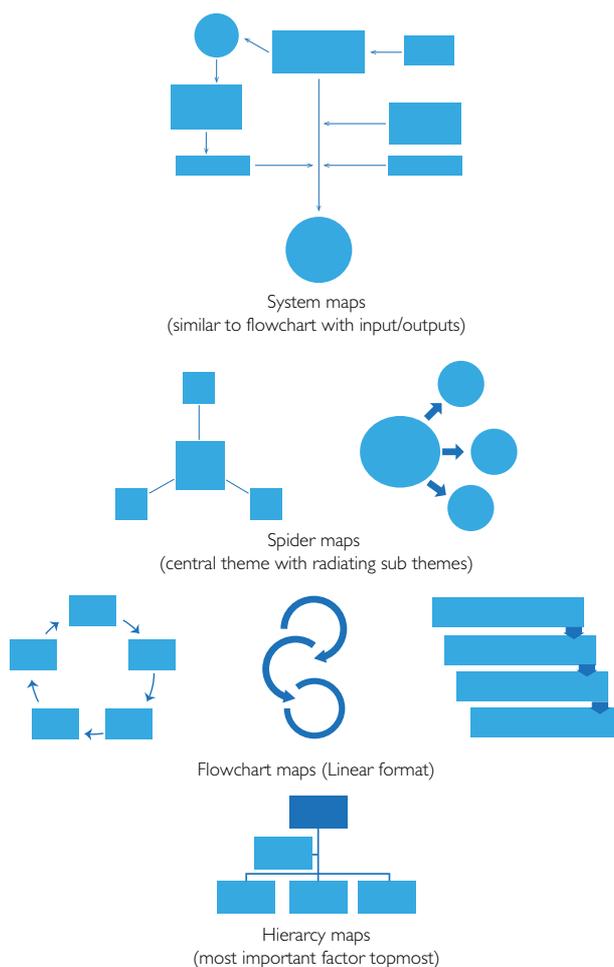


Figure 1. Major types of concept maps

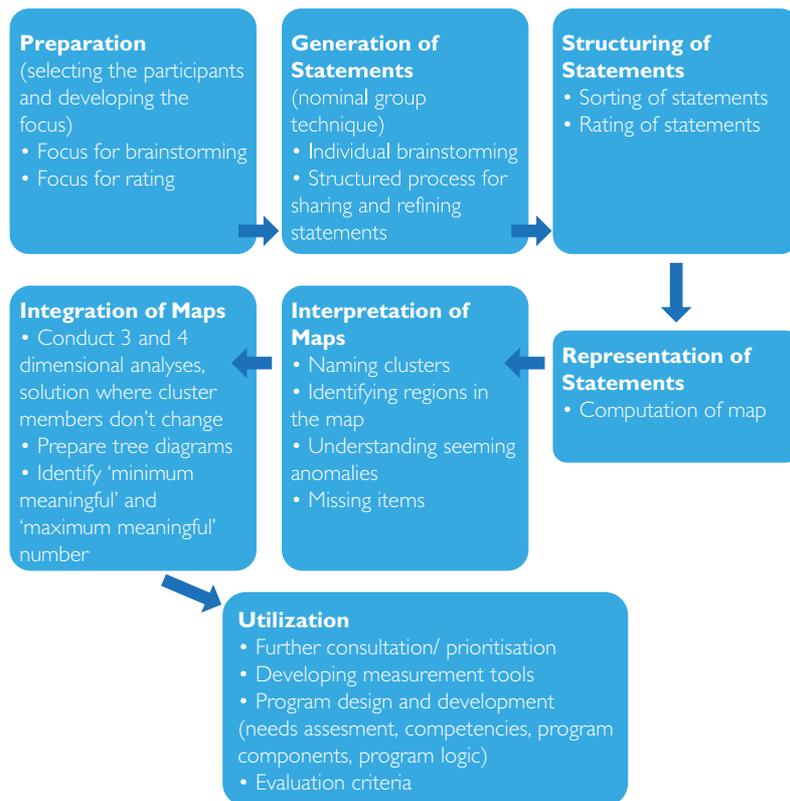


Figure 2. Steps in a concept mapping process. Source: Zee et al., 2016.

- System maps organize the information similar to flow charts type of concept maps. In addition to flow charts type of maps inputs and outputs are included in maps.

Customized type of concept maps are pictural maps (use a pictural presentation in order to identify and organize the information), multi-functional maps (use pyramids, cubes or other geometrical shapes in order to indicate the complexity and flow of information) and mandala maps (present the information overlapping each other and crossing with linked shapes by focusing on an area).^(19,20) Images about main concept maps are presented in Figure 1:⁽¹⁶⁾

The Concept Mapping Process

In concept map teaching method views of the individuals are presented as visually or graphically according to the discussed issue. While creating the map structure, multidimensional scaling and cluster analysis are carried out. These information and results are depicted on the map. Content of the map is wholly completed by the individual or group. Brain-storming in concept mapping process provides information about how the results would be interpreted and how the maps would be used.⁽²¹⁾

Concept mapping creating and using process have important points to consider. When concept maps is used in addition to

traditional teaching / learning strategies or instead of traditional teaching / learning strategies, it is necessary to be aware of the difficulties associated with their use. If it is mentioned about them briefly:^(16,22)

- There are some words to learn about concept maps. These concepts include some terms such as “nods, propositions, concepts, connections and hierarchy” and they all have meanings.
- Since concept mapping process requires some stages, enough time is needed (selecting the subject and related words or stages (concepts), ranking, clustering and organizing the concepts in a diagramatic presentation and associating the concepts with propositions).
- Computer programs are available to assist in the concept mapping process, however these programs must be regarded within learning cycle.
- During the preparation phase trainers must provide examples, feedback, assistance and awards to complete the assignment.
- Creating an environment which recognizes the various ways of ranking and clustering of concepts is important for information sharing and educational success.
- Educators must avoid from the identification of strict criteria for developing concept maps. A strict approach may deter the expression of the existence or lack of information.

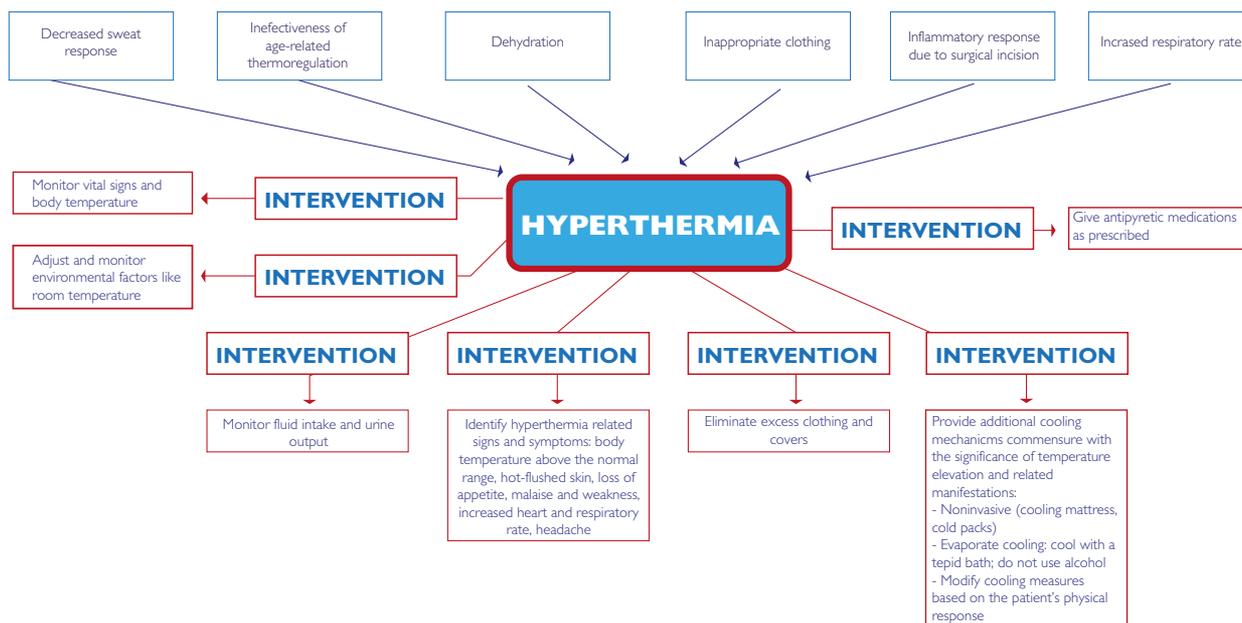


Figure 3. An example of spider concept map about hyperthermia nursing diagnosis by authors.

Concept mapping process must be conducted under the guidance of a facilitator. The facilitator is responsible both for counsellor and for planning and assessment. The facilitator must be active in managing the process, however the individual or group must be active at identification, interpretation and usage stages.⁽²¹⁾

A general overview for concept mapping process is presented in Figure 2.⁽³⁾ The descriptive criteria of 'hyperthermia' nursing diagnosis and nursing interventions are presented in Figure 3 as an example in the form of a spider concept map by the authors concerned with the concept mapping process by using the NANDA Nursing Diagnosis Handbook.⁽²³⁾

Concept Maps in Education

Concept maps generated by educators are typically created to maximize communication between educators and specialists. These maps can be used as a supplementary for course books and materials. For example, well-designed map samples can be used in ranking as course materials and brochures.⁽²⁴⁾ Educators can also create concept maps for understanding and analyzing their own learning styles, motivations, values and attitudes.⁽¹⁶⁾ In addition, students may convert their personal maps into a comprehensive and developed maps in time through small groups.⁽²⁵⁾

At the same time educators also use concept maps about the education period such as use of concept mapping technique in evaluating students' knowledge or describing organizational and process evaluation.^(26,27) Planning maps can be used for creating curriculum, course contents, and providing study guidelines for students. Evaluation maps are used for evaluating students'

success and identifying the misinformation and unclear points.⁽²⁸⁾

Concept Maps in Nursing Education

Nursing education is important for improving judgement and thinking skills of nursing students. One of the aims of nursing education is to graduate nursing students for ready to different clinical environments. The permanence of taught information and students participate in the process is important for realizing these objectives.⁽⁵⁾ Concept maps have a great impact on nursing student competencies for their nursing profession.⁽²⁹⁻³¹⁾ In recent years, there has been an increase in the use of concept maps in nursing education and studies with this subject.^(9,16) There are studies on the positive effects of the use of concept maps in achieving these objectives.^(7,10,11)

Although many nursing educators are aware of the importance of concept maps, number of nursing faculties including the concept maps in curriculum is very small. Some nursing educators use the concept maps actively in both theory and practice. Similarly, in our country, applications related to concept maps are being made at the degree of undergraduate and graduate education. There are positive results about the use of concept maps and also positive feedback from students.^(13,32) It was determined that the use of the concept map teaching method in nursing students improves the students' critical thinking skills,^(5,6) the sense of accomplishment, self confidence and making a concept map on their own.⁽¹⁾ In addition, it was found that students can more easily identify subjects they don't know and understand, can better understand the subject^(10,11) and it has a positive effect on their academic achievement.⁽⁷⁾ In recent years, when the studies on the use of concept maps in nursing education have been reviewed, it has been determined

that the countries where the studies are conducted vary (Turkey,⁽⁵⁾ Saudi Arabia,⁽⁷⁾ Iran,⁽³³⁾ Taiwan,⁽³⁴⁾ USA,⁽³⁵⁾ India⁽³⁶⁾ etc.). In addition, most of the studies compared the traditional teaching method with the concept map teaching method and it was found out that concept map teaching method had more positive effects.^(33,36-39)

Conclusion

Concept maps in nursing education are a learning and teaching strategy that are used as a method of combining practice and theory, case management, academic writing, and a studying technique of nursing students. It has been found out that concept map teaching method used in nursing education had positive effects such as the students' critical thinking skills, academic success, nursing competence skills, knowledge and comprehension levels, student satisfaction and cognitive learning levels. It is suggested teaching nursing students the points to be considered in the process of concept mapping, increasing knowledge level about concept maps, providing to practice and support nursing students adequately, and including courses related to concept maps in the curriculum.

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