



# Effectiveness of the Concept Map in Nursing Education; Developing a Tool for Student Opinions

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## Abstract

**Background:** To test the effectiveness of concept maps used in the education of nursing students in the field of health, we need to use measurement tools.

**Objectives:** The purpose of the study was to develop "Scale for the Effectiveness of Concept Maps in Nursing Education (SECMNE)".

**Methods:** This was a methodological instrument development study. This study was conducted in a university's health of nursing department in Tokat, Turkey, between September and December 2019. The universe of this study, which used a methodological design, consisted of third and fourth-year nursing students, and the sample size was 174. The item pool was formed with 86 items. The content validity was assessed by 9 experts. The 86-item draft scale that had a 4-point Likert type scoring system. Content validity ratio (CVR), Kaiser-Meyer-Olkin (KMO) test, Bartlett test, exploratory factor analysis (EFA), confirmatory factor analysis (CFA), Cronbach's alpha, and Pearson product-moment correlation analysis techniques were used for the validity and reliability analyses of the scale.

**Results:** The scale consists of 3 subscales (integration of information, integration of the care plan, perception) and 30 items. Scale's Cronbach alpha is 0.97.

**Conclusion:** The scale developed in this study was concluded to be a valid and reliable measurement tool that can be used to measure the effectiveness of the concept maps in nursing education. The SECMNE can help nursing student identify the lack of knowledge and negative attitudes about concept map in nursing education and prepare nursing care plan.

**Keywords:** Nursing, Concept Map, Reliability and Validity, Education

## 1. Background

Nursing is an applied profession that requires a significant combination of theoretical knowledge content with practical skills.<sup>1</sup> Therefore, nursing education requires planning that is made up of complementary theoretical and practical stages and an approach that involves cognitive, sensory, and psychomotor learning areas which will impart students caregiving, decision-making, protective, advocating, managerial, rehabilitative, and educational roles.<sup>2</sup> Clinical applications make up an important part of nursing education and the main purpose is to enable students to integrate theoretical knowledge with practice and to help them to learn by doing and experiencing in a real environment. The ultimate goal in promoting meaningful learning in health education is to educate students who can carry out optimal patient care in clinical practice.<sup>3</sup> Meaningful learning means that nursing students actively seek ways to relate new knowledge and experiences to what they already know, thereby creating an organized knowledge base that leads to the development of adaptive expertise in medical practice. The concept mapping teaching and learning strategy, which was developed by Novak and Gowin in 1984, is a strategy that encourages

meaningful learning.<sup>4</sup>

The concept map-based teaching method is one of the modern teaching methods that support important learning and a deeper perception of medical science.<sup>5</sup> Concept maps help students to learn information about basic concepts used in care, to combine new information with old knowledge by reaching the whole through establishing connections between the parts, and ensure permanence of knowledge.<sup>6</sup> Concept maps were developed as a result of a research project carried out by Joseph Novak with students of Cornell University in 1972.<sup>7</sup> Novak's studies were based on David Ausubel's (1968) meaningful learning model.<sup>8</sup> According to Novak and Gowin, all the activities in classes should be arranged and implemented to lead students to meaningful learning rather than learning by memorizing and to individual and discovery learning rather than passive learning. Therefore, it is important to use teaching-learning strategies that help establish correct inter-conceptual relationships to achieve meaningful learning.<sup>7</sup>

## 2. Objectives

A concept map is a graphical representation that expresses

the relationship between two concepts as well as their relationships with other concepts related to a particular topic. In a concept map, concepts are arranged in the form of pyramids and their relationships are displayed in upward and downward side forms.<sup>5</sup> The concept mapping used in nursing education is a method used to plan and create the nursing care and a diagrammatic representation of patient problems and nursing interventions.<sup>9</sup> Creating connections in a concept map used in patient care can give the opportunity to promote critical thinking skills in the student and to recognize the relationships between the problems, and to holistically see the physiological, psychological and social problems of the individual.<sup>6,10</sup> At the same time, this schematic structure makes the abstract concepts concrete by visualizing the relationship between them. With the use of concept maps in patient care, students can capture and relate the current diagnosis/diagnoses and connections between them by using patient data. By promoting student skills for analyzing problems that they will encounter in a complex clinical environment and developing their critical thinking skills, it can be possible to help students overcome these problems.<sup>9</sup>

It is important to test the effectiveness of the methods used in nursing education. Although various studies investigate the effect of concept maps on nursing education in the literature,<sup>9-15</sup> no measurement tools for evaluating concept maps have been found. This study aimed to develop a Likert type scale to evaluate the effectiveness of the concept maps used in nursing education. We think this scale can be used in clinical practice, the creation of nursing care plans, research, and evaluation of teaching outcomes.

### 3. Methods

#### 3.1. Aim and Type of the Study

The research is a methodological study due to the evaluation of the validity and reliability of the “Scale for the Effectiveness of Concept Maps in Nursing Education (SECMNE)”; it is a descriptive and cross-sectional study because it tests the effectiveness of the concept map with SECMNE in nursing education. The research questions were the following:

- Is the SECMNE a valid and reliable measurement tool?
- Do the psychometric characteristics of the SECMNE indicate that it is an appropriate tool for evaluating students’ attitudes towards the use of concept maps?

#### 3.2. The Universe and Sample of the Study

The universe of the study consisted of third and fourth-year students of the nursing department of a university. Simple random sampling method was used to determine the sample. A sample of 174 students was formed. In the reliability and validity studies during the development of a scale, working with a sample of 5-10 times the number of items in the scale is recommended to conduct the factor analysis.<sup>16</sup> Also, at least 30 pairs of data are recommended

to carry out the test-retest management that is applied in the examination of the time-dependent invariance.<sup>17,18</sup> Based on the number of items ( $n=43$ ) of the scale created in this study, we aimed to reach a group of students that included five times the number of the items in the scale ( $43 \times 5$ ). The study, which used the simple random sampling method, was completed with 174 students. In simple random sampling, the participants to be included in the research are randomly selected. In this method, although the probability of participants to participate in the research process is equal, the study universe is also homogeneous. Nursing students using the concept map method were included in the study according to the simple random sampling method. The demographic variables of the students are shown in [Table 1](#).

#### 3.3. Inclusion Criteria

The study included students who were informed about the study and submitted consent for the voluntary participation in the study, took the Internal Medicine Nursing course at this university, and had no communication problems (in terms of using the Turkish language or having mental health).

#### 3.4. Development of Data Collection Tools

##### 3.4.1. Scale Development Steps

1. As a result of the data obtained based on the studies conducted by the researcher, an 86-item draft form of the scale with a four-point Likert type scoring system (1 = Never, 2 = Sometimes, 3 = Often, 4 = Always) was created.<sup>5,6,9-15,19-25</sup>
2. The 86-item draft scale was submitted to the opinions of two faculty members who were experts in the field of Turkish language and literature to test the appropriateness of the language.
3. After obtaining the opinions of the language experts, the form was submitted to the opinions of 9 professionals for the evaluation of appropriateness and comprehensibility of each scale item. The evaluators were asked to rate each item using a scale ranging from 1 to 3 such as “(1) Appropriate-Measures the target structure”, “(2) Needs modification – Measures the target structure but needs a slight modification”, “(3) Inappropriate – Does not measure the target structure”. They were also asked to write their suggestions in the “suggestion” box separately for each item.
4. As a result, a 43-item 4-point Likert-type draft scale was created.

#### 3.5. Data Collection

The study data were collected by the researchers using the face-to-face interview technique. Research data were collected at a university’s health of nursing department between September 2019 and December 2019. The phone numbers of 32 students selected by random sampling method from the sample group were taken and they were given the test again 15-20 days later for the test-retest administration.

**Table 1.** Explained Variance Rates after Varimax Rotation Analysis

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% Of Variance	Cumulative %	Total	% Of Variance	Cumulative %	Total	% Of Variance	Cumulative %
1	16.379	54.597	54.597	16.379	54.597	54.597	9.386	31.287	31.287
2	1.925	6.416	61.014	1.925	6.416	61.014	8.250	27.498	58.786
3	1.329	4.431	65.445	1.329	4.431	65.445	1.998	6.659	65.445
4	1.064	3.545	68.990						
5	0.914	3.048	72.038						
6	0.778	2.595	74.632						
7	0.682	2.274	76.907						
8	0.584	1.945	78.852						
9	0.576	1.920	80.772						
10	0.494	1.647	82.419						
11	0.472	1.572	83.992						
12	0.460	1.532	85.524						
13	0.423	1.411	86.935						
14	0.385	1.283	88.218						
15	0.380	1.267	89.485						
16	0.338	1.126	90.611						
17	0.313	1.044	91.655						
18	0.297	0.990	92.645						
19	0.269	0.896	93.541						
20	0.251	0.838	94.379						
21	0.235	0.783	95.162						
22	0.219	0.731	95.893						
23	0.215	0.717	96.610						
24	0.189	0.630	97.240						
25	0.181	0.605	97.845						
26	0.170	0.566	98.410						
27	0.146	0.485	98.896						
28	0.134	0.448	99.343						
29	0.103	0.345	99.688						
30	0.094	0.312	100.000						

### 3.6. Data Analysis

The data obtained from the study were evaluated on the IBM SPSS version 23 (Statistical Package for Social Science) statistical software package. Cronbach's alpha was used to determine the internal consistency of the scale, exploratory factor analysis (EFA) was employed to determine the factor structure, and Kaiser-Meyer-Olkin (KMO) and Bartlett tests were used to determine the adequacy of the sample size. The non-additivity of the test structure was analyzed using Tukey's test for non-additivity. Dependent samples *t* test was used for retest and Pearson's correlation test was used for the correlations. Confirmatory factor analysis (CFA) was conducted using the AMOS 21.0 software package. The significance level was taken as  $P < 0.05$ .

## 4. Results

### 4.1. Content Validity Assessment

The content analysis of SECMNE was examined by nine

experts. The content validity ratio (CVR) value for 9 experts at  $\alpha = 0.05$  significance level is 0.75.<sup>26</sup> Accordingly, 43 items with a CVR value of  $< 0.75$  were removed from the scale. Once the CVR is defined for each item, the content validity index (CVI) is calculated for the overall test. In this case, the CVI value is obtained by calculating the mean of the calculated CVR values of the items which are found to be eligible to remain on the scale.<sup>25</sup> The CVI value of the draft scale was found to be 0.85. This finding indicated that the content validity of the remaining 43 items of the scale was statistically significant since CVI was greater than CVC ( $CVI > CVC$ ).

### 4.2. Exploratory Factor Analysis

EFA is used to determine the construct validity of the scale statistically. KMO and Bartlett tests were performed to primarily determine whether the scale was suitable for factor analysis. In the factor analysis conducted for

the SECMNE, the KMO value was calculated as 0.96. According to this value, the sample size was found to be suitable for factor analysis ( $KMO > 0.500$ ). As a result of the Bartlett test, the  $\chi^2$  value was found to be 4389.694 and statistically significant ( $P < 0.021$ ). Accordingly, the normality of distribution was achieved. According to the results of KMO and Bartlett tests, the study data were concluded to be suitable for factor analysis.

A scree plot showing the scatter plot of the eigenvalues was created to determine the factor structure of the scale. As indicated by the graph, the scale was found to have a three-factor construct. To determine the distribution of the items to the factors in the three-factor construct, the varimax rotation analysis was performed. After rotation, the SECMNE with three factors consisting of 30 items with a total variance explained of 65.44% demonstrated the best solution (Table 2).

As a result of validity analyses, the first subscale of SECMNE was named as "integration of a care plan" (11 items), the second subscale as "integration of information" (16 items), and the third subscale as "perception" (3 items) (Table 3). The details are as follows;

Integration of a care plan (11 items) had factor loadings ranging from 0.57-0.83 and accounted for 27.49% of variance with alpha coefficient of 0.95.

Integration of information (16 items) had factor loadings ranging from 0.60-0.76 and accounted for 31.28% of variance with alpha coefficient of 0.96.

Perception (3 items) had factor loadings ranging from 0.63-0.78 and accounted for 6.65% of variance with alpha coefficient of 0.58.

#### 4.3. Confirmatory Factor Analysis

CFA analysis was conducted to confirm the factor construct of the scale and to calculate the fit indices. According to the results of the CFA of the scale, the fits indices were found to be appropriate and the factor constructs were fit (Figure 1).

According to the CFA analysis conducted to confirm the EFA, SECMNE was determined to consist of three sub-dimensions. First, the fit indices were analyzed. The error terms were modified to achieve the fit indices (Figure 1). Afterward, all of the fit indices calculated as a result of CFA analysis was found to provide acceptable fit index values.

#### 4.4. Construct Validity Assessment

The construct validity of the SECMNE was tested using EFA and CFA. The EFA and CFA came up with three factors with 30 items, all factors had eigenvalues greater than 1 and most of them accounted for at least 5% of variance which was adequate.

#### 4.5. Reliability Assessment

The researcher performed internal consistency testing to assess the reliability of the 30-item SECMNE measuring the Cronbach's alpha coefficients of the total scale and found the result = 0.97. This result shows that the scale

has high reliability. The Cronbach's alpha coefficients of all factors ranged from 0.58-0.96 (Table 3). The cronbach alpha value of the third sub-dimension is 0.579. Cortina states that the main reason for this is the low number of items.<sup>27</sup> The stability of SECMNE was examined using the test-retest method. The result showed correlation between the scores of moral commitment evaluated twice ( $r = 0.99$ ,  $P < .001$ ).

#### 4.6. Scoring of the Scale

Considering the structure of the present scale, the scoring of the items was done according to a 4-point Likert type as "1" never, "2" sometimes, "3" frequently, and "4" always. The lowest score that can be obtained from the 30-item final form of the scale was 30, and the highest score was 120. Items 4, 18 and 22 were scored inversely. The total score of the scale is calculated by summing the points corresponding to the responded items. The scores of the subscales are calculated separately. The increase in the total score obtained from the scale shows that the concept map is effective in nursing education. In this study, the mean score of the SECMNE was  $83.13 \pm 17.05$ . The mean subscale scores were found to be  $32.15 \pm 7.60$  for the Integration of a Care Plan subscale,  $44.72 \pm 10.61$  for the Integration of Information subscale, and  $6.25 \pm 2.12$  for the Perception subscale (Table 4).

#### 5. Discussion

The SECMNE final version is composed of 30 items with 3 factors. All items of the SECMNE were composed of high factor loadings ranging from 0.57-0.83 which indicated that all items have a high level to interpret the structure, and correlation among the items and also between the items and the factors were achieved.<sup>17,18</sup> Then, a CFA analysis was performed to confirm the factor structure of the scale and to calculate the fit values. Several fit indices are used to determine the adequacy of the model tested in CFA. The fit indices of the model were found to be as follows:  $\chi^2/sd$  (1.482), GFI (0.822), RMSEA (0.053), RMR (0.035), CFI (0.955), GFI (0.822), AGFI (0.801), SRMR (0.052), and NFI (0.947). The values were observed to provide acceptable fit indices.<sup>16</sup> Considering the results of the last factor analysis done with the present items, the four factors were determined to explain 65.44% of the total variance. The higher the total variance rate is, the stronger the scale is. In scales that measure attitudes and behaviors, variance values between 40% and 60% are accepted ideal.<sup>16</sup> Accordingly, the total variance value of our scale was found to be satisfactory.

The overall internal consistency of the 30 items of the SECMNE was 0.97 and ranged from 0.58-0.96 for each factor which indicated reliability.<sup>28</sup> The cronbach alpha value of the third sub-dimension is 0.579. The main reason for this is the low number of items. Since the total Cronbach's alpha value of the scale is excellent, we recommend re-studying this value in different sample groups. Another step of the scale reliability study includes

**Table 2.** The Results of the Exploratory Factor Analysis

Items	Factor Loading			Cronbach's Alpha	Explained Variance Ratio
	1	2	3		
<b>Factor 1: Integration of a care plan</b>				0.95	27.49%
1. Concept maps allow me to be more active in the clinic	0.579				
2. Concept maps enhance my clinical success	0.641				
3. Concept maps allow me to think deeply when I am interpreting patient data	0.648				
5. Concept maps are effective in interpreting complex patient data	0.691				
6. Concept maps help me to make sense of pathological events	0.746				
7. Concept maps enhance my ability to interpret patient data	0.738				
8. When preparing concept maps, I understand the etiology (causes) of the disease better	0.832				
9. The concept maps help me to learn the outlines of the disease	0.797				
10. Since the concept maps allow me to dominate the subject more, I gain more self-confidence.	0.699				
11. Concept maps allow me to embody abstract information	0.751				
12. Concept maps allow me to see the relationships between diseases better	0.631				
<b>Factor 2: Integration of information</b>				0.96	31.28%
13. Concept maps allow me to learn and have fun		0.679			
14. Thanks to the concept maps, I can determine the problems that may occur in my patient beforehand.		0.602			
15. Concept maps allow me to establish a cause-effect relationship between data.		0.670			
16. Concept maps allow me to plan the care I will offer to my patient individually.		0.644			
17. Concept mapping is a teaching method that should be used in nursing education.		0.641			
19. To me, concept mapping is a very instructive method.		0.714			
20. Concept maps allow me to find general concepts on the subject.		0.734			
21. Preparing a concept map is very enjoyable.		0.715			
23. Concept maps allow me to add new information to my existing knowledge.		0.761			
24. Concept mapping allows me to classify information		0.712			
25. Concept mapping allows me to think individually.		0.751			
26. Concept maps allow me to see my individual performance.		0.714			
27. Concept maps allow me to see how I learn.		0.762			
28. Concept maps enable me to organize information visually.		0.710			
29. Concept map improves my problem-solving skills for new problems developing in my patient.		0.718			
30. Concept maps allow me to learn the relationship of concepts by defining them on a cause-and-effect basis		0.659			
<b>Factor 3: Perception</b>				0.58	6.65%
4. Concept maps reduce my critical thinking skills.			0.625		
18. I think it is unnecessary to prepare a care plan with the help of a concept map.			0.782		
22. I don't want to use concept maps in the clinic.			0.742		
The Scale for the Effectiveness of Concept Maps in Nursing Education	0.579-0.832			0.97	65.44%

**Table 3.** Values Corresponding to Percentages by Scale for the Effectiveness of Concept Maps in Nursing Education

	Percentages			Mean	SD	Min.	Max.
	25	50	75				
<b>Cutoff points</b>	73	83	95	83.13	17.05	30	120

*P*<0.05

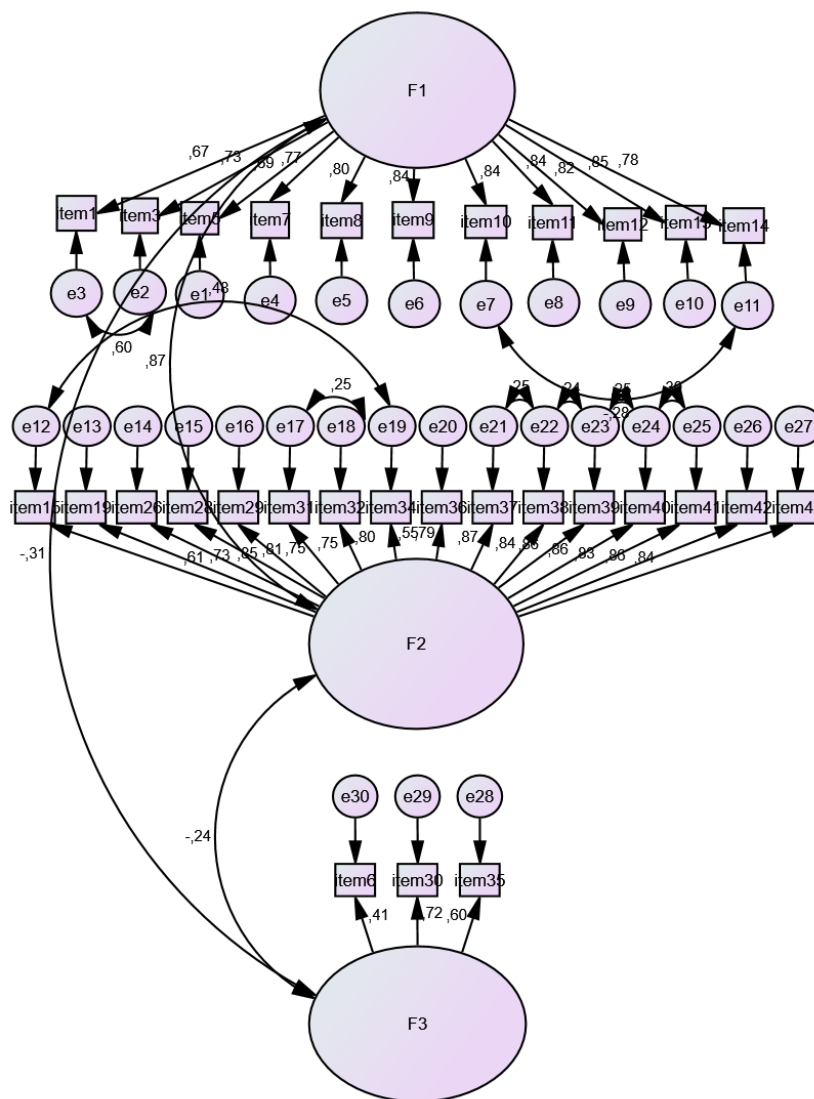
determining the time invariance. Analyze revealed that SECMNE was a reliable scale also in terms of time invariance.

The concept map is known to be particularly useful in embodying concepts in nursing education, where abstract concepts are frequently used, playing the role of a bridge that can fill the gap between theory and practice, and

making students adopt a more systematic, meaningful, inquisitive, and holistic approach while preparing care plans.<sup>5,6,9-15,19-25</sup> Developed to measure the effectiveness of the concept map used in nursing education, the SECMNE is thought to be an effective measurement tool in determining the contribution of the concept map to theoretical and practical teaching.

The first sub-dimension of the scale was labeled as the “integration of care plan” because under this sub-dimension, there were items that determined the effectiveness of the concept maps in clinical practices and care plans of nursing students, such as “Concept maps are effective in helping me interpret complex patient data” and “Concept maps allow me to think deeply while interpreting





CMIN=583,852; DF=394; p=,000; CMIN/DF=1,482; RMSEA=,053; GFI=,822; CFI=,955

Figure 1. The Results of Confirmatory Factor Analysis

Table 4. Mean Scores of the Scale and its Sub-dimensions

	Mean ± SD	Min.	Max
SECMNE	83.13 ± 17.05	30	120
Integration of a Care Plan	32.15 ± 7.60	11	44
Integration of Information subscale	44.72 ± 10.61	16	64
Perception	6.25 ± 2.12	3	12

patient data”. These were the statements that questioned the effectiveness of concept maps in interpreting patient data correctly, determining patient needs and problems, and planning necessary nursing interventions for them. Also, the items under this sub-dimension, such as “Concept maps are effective in helping me interpret complex patient data” and “Concept maps allow me to embody abstract information”, were supported by the results of studies evaluating the effectiveness of concept map use. Yue et al and Chabeli reported that concept maps improved nurses’ analytical skills and facilitated critical thinking in the complex nursing process.<sup>15,29</sup> Harpaz et al

stated that during the mapping process, nursing students developed skills to interpret, embody, analyze, and evaluate rational flows of thought about abstract themes.<sup>30</sup> Aein and Aliakbari found that care plans prepared using concept maps were more effective than those prepared according to traditional methods.<sup>31</sup> Mueller et al stated that traditional care plans suppressed students’ critical thinking skills and prevented comprehensive care.<sup>32</sup> Moreover, Abd El-Hay et al reported that concept maps increased problem-solving skills in nursing students.<sup>33</sup> Concept maps in clinical nursing practices contribute to the improvement of the nursing process by providing a complete collection of clinical data, early identification of patients’ problems, analysis of the relationships between problems, and making rational decisions.<sup>15</sup> The mean score that the nursing students got from the “integration of care plan” sub-dimension was 32.15 ± 7.60 (min.: 11-max.: 44). This result was similar to the results in the literature.<sup>10,33,34</sup> According to this result, it can be said that the use of concept maps by nursing students increases

their clinical skills and is more effective than traditional care plan methods while preparing care plans.

The second sub-dimension of the scale was named the “integration of information” because the main theme was based on increasing the knowledge and skills of nursing students, achieving meaningful learning, finding general concepts about the subject, and making sense of the “cause and effect” relationship that formed the basis of the thought of nursing education, as in the items making up the sub-dimension, namely, “Concept maps enable me to establish a cause-effect relationship between data” and “Concept maps allow me to classify information”. It was based on making sense of the “cause-effect” relationship. Novak stated that while creating a concept map, information, themes, or the relationships between them were arranged visually.<sup>35</sup> Similarly, Yue et al stated that concept maps presented data and their relationships clearly using nodes and connections.<sup>15</sup> Research results from a study conducted in the United States were consistent with our findings, which showed that the use of concept maps helped students to coordinate knowledge and to identify cause-effect relationships and concepts that guided the curriculum.<sup>36</sup> Concept maps increase the relationship between theory and clinical practice, enabling nursing students to associate new information with existing knowledge and to integrate interdisciplinary knowledge in a meaningful way.<sup>15,34</sup> In this study, the mean score that the nursing students got from the “integration of information” sub-dimension was  $44.72 \pm 10.61$  (min.:16-max.:64), which indicated that nursing students could close the gap between theory and practice with concept maps and that they were an effective tool in doing the intra-association of information.

The third sub-dimension of the scale was named as “perception”. The items that made up this sub-dimension were specially created to prevent students from being positively oriented and to detect, if any, negative opinions about the concept map. Items, such as “I think it is unnecessary to prepare a care plan with a concept map” and “I do not want to use a concept map in the clinic”, aimed to measure nursing students’ negative perceptions about concept maps. Although it was not clear whether negative items contributed to the reliability and validity of the scale, there were some study results indicating that they increased validity and reliability, while others claimed they did otherwise.<sup>37-39</sup> Therefore, negative items were included on the scale for participants to avoid the necessity of approval and to achieve an objective assessment.<sup>37</sup> At the same time, according to their study conducted to determine the views of nursing students on the use of concept maps, Bressington et al<sup>34</sup> and Tunam<sup>6</sup> stated that students scored the items that expressed negative opinions about concept maps, which showed the necessity of negative items.<sup>6,34</sup> In this study, the mean score of the nursing students on the “perception” sub-dimension was  $6.25 \pm 2.12$  (min.: 3-max.: 12), which showed that nursing students did not have a negative judgment against concept maps.

## Research Highlights

### What Is Already Known?

- Concept map in nursing education is very important in preparing a nursing care plan.
- The concept map is effective for nursing students to prepare nursing care plans, to transfer theoretical knowledge to practice, to establish a relationship between old and new knowledge.
- It is important to test the effectiveness of the methods used in nursing education
- There is no measurement tool to evaluate the concept map.

### What Does This Study Add?

- Based on our findings the tool can be used to measure the effectiveness of the concept maps in nursing education.
- The SECMNE was a reliable and valid measurement tool that can be employed to evaluate the effectiveness of concept maps used in nursing education.
- The effectiveness of concept map can now be measured with a valid and reliable tool to support effective nursing education.

## 6. Conclusion

In conclusion, the SECMNE was determined to be a reliable and valid measurement tool that can be employed to evaluate the effectiveness of concept maps used in nursing education. The findings at hand show that the scale has enough quality for enabling nursing students to prepare a nursing care plan, to transfer theoretical knowledge into practice, to establish a relationship between old and new knowledge, and to determine positive and negative attitudes towards the use of concept maps. This scale is of great significance in evaluating students’ attitudes towards the use of concept maps. On the other hand, since there are no similar scales in the literature, we think that the scale that has been developed in this study will serve as a reference for studies to be conducted within this framework.

### Authors’ Contributions

SLT, YB and DS designed the study. SLT and YB collected the data. SLT, YB and DS analyzed the data. SLT, YB and DS prepared the manuscript. All authors approved the final version for submission.

### Conflict of Interest Disclosures

The authors declare no financial or personal interests that could bias the work.

### Ethical Approval

Ethical approval was obtained from the Ethical Board (Date/Number: 28.08.2018/11). The informed consent was read to the students who participated in the study and they were informed about the purpose of the study; afterward, their verbal and written consent was obtained.

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