

## Study Effect of Apply Concept Map on Students' Perception to Antenatal Unit

Amira Mohammed Attia, Safaa Abd-El Raouf Hashim, Sahar Mossa Soliman

Maternity and Gynecological Nursing Department, Faculty of Nursing - Ain Shams University.

### Abstract

**Background:** Most of the recent studies in nursing education have been focused on outcomes of learning. Using traditional method in studying nursing materials, which emphasizes on cognitive acquisitions, may encourage students to adopt rote (memorized) learning rather than meaningful or deep learning approaches. This study was aiming to assess the effect of using of concept map on the nursing students' achievement. It was conducted on 259 students studying obstetrics & gynecology nursing course in the 2014-2015 academic year were recruited in the study. They were divided into two groups: 122 students attended 1st semester were control group who follow traditional method in their studying while 137 students attended 2nd semester were study group who used the concept map as a study tool. Data were collected through questionnaire sheet, midterm & final written exam and students' opinionnaire sheet. The result of this study revealed that there is statistically significant difference was found between both groups regarding students' achievement in the midterm & final exam. There is highly statistically significant difference was found between total knowledge regarding concept map & achievement of the students of control group & study group. There is highly statistically significant difference was found between source of knowledge regarding concept map & achievement of students of the students of both control group & study group. Results provided empirical support for the use of concept mapping as a meta cognitive intervention to increase students' meaningful learning and academic achievement. The results of concept mapping as a study tool significantly improves third year nursing students' achievement in antenatal units than traditional method. Based on the finding the following is recommended: Organize workshops and seminars for nursing students to update their knowledge on the use of the concept mapping strategy as a study tool and to save more time for practice. Include concept maps and concept mapping activities in the textbooks.

**Key words:** Concept Map – students' Perception - Antenatal Unit.

### Introduction

Egypt has the largest overall education system in the Middle East and North Africa and it has grown rapidly since the early 1990s. In recent years the Government of Egypt has accorded even greater priority in improving the education system. According to the

Human Development Index (HDI), Egypt is ranked 123 in the HDI, and 7 in the lowest 10 HDI countries in the Middle East and Northern Africa, in 2009. Education crisis in Egypt is very complicated, public education is not capable of providing quality education and is hardly providing any education with the shortage in facilities, lack of

## **Study Effect of Apply Map on Students Perception to Antenatal Unit**

---

trained educators and inflation in classes (Osman, 2011).

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 co-morbidities (Ghojzadeh et al., 2014).

There is a growing awareness of the need for changes in nursing education systems. Educational researchers and theoreticians believed that applying teaching/learning solution causes significant improvement in learning. Focusing on met cognitive skills such as reasoning, critical thinking and problem solving is a must for nursing education. Obtaining such outcomes requires a paradigm shift in nursing education (Wilgis & Mcconnell, 2008).

Concept mapping is one of the educational strategies, which involves the use of flow charts to organize central concepts and which facilitates understanding of the relationships between them. By using the concept mapping, 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 sub concepts until knowledge is fully grasped. This strategy is applicable to nursing education where a large amount of information is presented and assimilated (Chawla & Singh, 2015).

### **Significance of the Study:**

---

It is commonly assumed that adult students are proficient in how to learn.

However, it is evident that even college students have difficulty abstracting important information, discerning relationships between ideas, and integrating the information with their prior knowledge to form coherent understandings. In addition that, there is a growing awareness of the need for changes in nursing education systems, especially in developing self-learning techniques where the student is an active in the learning process. If the educational goal in nursing is indeed to develop a professional who is able to self-direct and to continue on the educational path, the individual must be skilled in the process of self learning (Ghojzadeh, et al., 2014).

Ante natal care & high risk pregnancy are pre-requisites for the other parts related to obstetric and gynecological nursing as labor, post partum period and gynecological diseases. Furthermore, the ante natal care cannot be isolated in the studying from the rest of other parts since it considered the basic knowledge for the whole field of obstetrics & gynecology. However, the traditional study method which based on rote learning rather than meaningful learning and also which make the students consider the different concepts as isolated elements of knowledge is predominantly used in the studying of ante natal and high risk pregnancy course (Onasoga et al., 2012)

Nursing students need support in their effort to achieve what they consider necessary for antenatal care. Interventions for educating and supporting nursing students should be targeted at enabling them to deal with all the factors that influence their role and help them to identify and use better strategies to provide quality care (Daley & Torre, 2010).

One such educational strategy is concept mapping, which involves the use of flow charts to organize central concepts and which facilitates understanding of the relationships between them. Research has shown that concept mapping is an advanced method for successful learning. As it can help advance learning processes and develop skills needed by the student, such as critical thinking, organization of information, understanding complex relationships, and the integration of theoretical knowledge and nursing practice (Wu et al., 2012).

#### **Aim of the study**

---

This study aims to evaluate the effect of Apply Concept Map on Students' Perception to Ante Natal Unite.

#### **Material and Methods**

##### **Research design:**

The current research design is a quasi-experimental design.

##### **Setting of the study:**

The study was conducted in lecture class of maternity & gynecological nursing at faculty of nursing, Ain Shams University

##### **Subjects:**

According to the curriculum design of the third year students pediatric nursing and maternity & gynecological nursing teaching are interchangeably.

A total of 259 students studying maternity and gynecological nursing course in the 2014- 2015 academic year were recruited in the study. There were divided into two groups.

**Group (1):** included students in first term which were (122 students), it considered control group who follow the traditional educational method in ante natal care and high risk pregnancy.

**Group (2):** were (137 students) while this group considered study group who educate ante natal care and high risk pregnancy by using concept map strategy

**(NB):** Total number of students in 2nd term more than 1st term due to reset percent from 2nd year

#### **Tools of Data Collection:**

The data were collected by:

##### **I. Basic students' data & knowledge assessment sheet regarding concept map:**

This questionnaire format was developed by the researcher, based on reviewing the related literature and guided by supervisors. It consists of two parts:

**Part (1):** involve basic student data (students' name, age, gender & type of previous secondary education).

**Part(2):**involve students' opinion in the different teaching methods used during their studying in their previous academic years

**Part(3):**involve assessment of students' knowledge & opinion about methods of education during ante natal unit studying.

## Study Effect of Apply Map on Students Perception to Antenatal Unit

### II. Students' Achievement Assessment Tool:

This tool is students' achievement tests through the study period which are midterm & final exam.

#### ➤ Scoring system:

- Excellent: 85% up to 100%
- Very good: from 75 % to less than 85%
- Good: from 65% to less than 75%
- Pass: from 60% to less than 65%
- Poor: less than 60%

### Ethical consideration:

The ethical research considerations in this study include the following:

1. this research will not interfere with culture and traditions
2. no physical or psychological hazards and will follow ethics and human rights and will used to serve large sector of nursing students to serve large sector of Egyptian women
3. the data will be confidential and will be used only for research's purpose
4. the participant consent will be taken before interviewing , each participant will be informed about nature process of the expected outcomes of the study and is free to withdraw at any time throughout the study

#### Administrative design:

An official letter to conduct the study was obtained from the head of

maternity and gynecological nursing department.

#### Operational design:

Operational study will be discussed in terms of preparatory phase, pilot study and field of work:

#### Preparatory phase:

Review of the current, past local and international related literature about the various aspect of the problem using books, articles and magazines. This review helped the researcher to be acquainted with magnitude of the study guided and guided the researcher to prepare data collection tools.

#### Pilot study:

Pilot study was carried out on 10% from total sample size which were included in the study. The aim of pilot study was to evaluate the content validity and reliability of the tools going to be used for data collection and find out the possible obstacles or problems that might be faced researcher and interfere with data collection then accordingly tools were modified. Students included in the pilot study were not excluded from the sample because they could not exclude from registration to this year Major modification were not needed on tools of data collection based on the finding of pilot study.

#### Field work:

The antenatal care and high risk pregnancy course was taught by the academic staff in maternity & gynecological department for the third students on both terms according to pre-designated schedule of the allocated hours.

The researcher explained the teaching methodology for the students at the beginning of the course. Students were asked to fill the questionnaire sheet first and the opinionnaire sheets

The study was carried out in the following phases planning, implementation and evaluation. All those phases consumed 12 month. The preparation phase took about three months, from the beginning of June to the end of September 2014. Implementation phase consumed the following six months till the end of June 2015. Data analysis and evaluation phase take about three months.

The Ante natal care & high risk pregnancy taught using traditional method “lecturer“ for the control group according to the predesigned schedule of the allocated hours. Handout, teaching materials and session plan for antenatal care &high risk pregnancy was designed according to time allowed in the course “12 hours for theoretical part”. Students’ knowledge was tested through implementation in midterm and final exam.

In the 2nd term the researcher taught the ante natal care &high risk pregnancy for the study group by using concept map learning technique. As students were divided equally into four large groups. Each group consist of 34 students because of time and resources constrains. The activities were done in the class for all groups.

By the end of the course post-assessment was done. It covered theoretical and opinionnaire for all students in both groups and it took about 15 minutes.

### **Statistical Design:**

### **Statistical analysis:**

Data entry and statistical analysis was done using statistical package for the social science “SPSS” version.

Data were presented using descriptive statistics in the form of frequencies and percentage for qualitative variables, and means and standard deviations for quantitative variable; qualitative variables were compared using chi-square test. While quantitative variables were compared using independent T test. Statistical significance was considered at P value <0.05

### **Limitation of the study:**

Number of reset students in 1st term less than 2nd term which change total number of sample size in each term.

There are (8) students were not attended regularly all lectures so they not included in the study sample.

### **Result:**

---

**Table (1):** this table illustrate that the mean age of the control group was  $20.51 \pm 1.879$  while the mean age of the study group was  $20.62 \pm .710$ . The table also showed that the percentage of whom had a secondary & Technical institute of Nursing as previous level of education in the control group were 85 % & 15 % respectively while the percentage in the study group were 91.7% & 8.3% respectively.

**Table (2):** illustrate that, there is highly statistically significant difference was found between the total knowledge of the both control and study group in which  $X^2 = 2.440$

### Study Effect of Apply Map on Students Perception to Antenatal Unit

**Table (3):** indicates the increase in the percent of the failed students of control group students as regard the students' achievement from 49.3% in the midterm exam to 54% in the final exam while there is an improvement in the study group as regard the excellent percent increase from 43.1% in midterm exam to 55.6% in final exam while the failed student decreased from 16.8% to 3.6%.

**Table (4):** illustrate that, there is highly statistically significant difference was found between total knowledge regarding concept map & achievement of the students of control group & study group in which  $x^2 = 2.380$ .

**Table (5):** illustrated that, there is highly statistically significant difference was found between source of knowledge regarding concept map & achievement of

students of the students of both control group & study group in which  $x^2 = 2.410$ .

**Table (6):** illustrated that, there is highly statistically significant difference was found between gender & achievement of students of both control group & study group in which  $x^2 = 2.310$ .

**Table (7):** shows that, there is highly statistically significant difference was found between knowledge regards concept map & Types of education of both control group & study group in which  $x^2 = 2.438$ .

**Table (8):** shows that, there is highly statistically significant difference was found between knowledge regards concept map & Types of education of both control group & study group in which  $x^2 = 2.438$ .

**Table (1):** Students' demographic data.

Items	Control group (N= 122) %	Study group (N = 137) %
Students' mean age in years $\pm$ SD	20.51 $\pm$ 1.879	20.62 $\pm$ .710
Students' gender		
Male	23.7	16.7
Female	76.3	83.3
Students' previous level of education		
Secondary	85.2	91.2
Technical institute of Nursing	14.8	8.8

**Table (2):** Total students' knowledge regarding concept map:

Item	Control group N= 122 %	Study group N = 137 %	X2	P value
Complete	12.3	59.7		
Incomplete	24.6	33.6	2.440	0.000
Incorrect	63.1	6.7		

**Table (3):** Students' achievement in Antenatal Unite using Traditional & Concept Map method.

Students' level	Control group N= 122 (Traditional Method)		study group N= 137 (Concept Map Method)	
	%		%	
	Midterm Exam	Final Exam	Midterm Exam	Final Exam
Excellent	13.1	16.4	43.1	55.6
Very good	9.8	12.3	13.1	19.7
Good	9	12.3	16.8	17.5
Accepted	18.8	5	10.2	3.6
Failed	49.3	54	16.8	3.6
T <sup>1</sup> (midterm of control & study group)	3.171		T <sup>2</sup> (final term of control & study group)	3.071
P value	0.000		P value	0.000

**Table (4):** Relation between knowledge regards concept map & achievement of students.

Knowledge level	Control group N (122) (Traditional Method)			Study Group N(137) (concept Map Method)		
	Complete	Incomplete	Incorrect	Complete	Incomplete	Incorrect
Student's Achievement						
Excellent	13.4	23.3	14.3	54.8	52.1	77.7
Very Good	20	16.6	9.2	20.7	21.8	0
Good	13.3	10	12.9	17.1	21.8	0
Accept	0	0	7.8	3.7	0	22.3
Failed	53.3	50.1	55.8	3.7	4.3	0
X <sup>2</sup>	2.380					
P value	0.000					

### Study Effect of Apply Map on Students Perception to Antenatal Unit

**Table (5):** Relation between source of knowledge regarding concept map & achievement of students

Source of Knowledge	Control group N (122) (Traditional Method)			Study Group N(137) (concept Map Method)		
	Study	Previous experience	Not used	Study	Previous experience	Not used
Excellent	0	0	16.9	56.7	50	0
Very Good	0	25	11.8	19.7	25	0
Good	0	0	12.7	18.9	0	0
Accept	0	25	4.2	3.9	0	0
Failed	0	50	54.3	0.8	25	100
X <sup>2</sup>	2.410					
P value	0.000					

**Table (6):** Relation between gender & achievement of students:

Gender	Control group N (122) (Traditional Method)		Study Group N(137) (Concept Map Method)	
	Male	Female	Male	Female
Excellent	13.8	17.2	65.2	53.5
Very Good	17.2	10.7	21.7	19.2
Good	24.1	8.6	8.7	19.2
Accept	6.9	4.3	4.3	3.5
Failed	38	59.1	0	4.4
X <sup>2</sup>	2.310			
P value	0.000			

**Table (7):** Relation between knowledge regards concept map & Types of education

Type of Teaching method	Control group N (122) (Traditional Method)		Study Group N(137) (Concept Map Method)	
	Traditional method	Creative method	Traditional method	Creative method
Students' Knowledge Complete	11	40	50	60
Incomplete	24.8	20	0	34
Incorrect	64.1	40	50	6
X <sup>2</sup>	2.438			
P value	0.000			

**Table (8):** Relation between current using of concept map & achievement of students

Current use of concept map during studying	Control group N (122) (Traditional Method)		Study Group N (137) (Concept Map Method)	
	Yes	No	Yes	No
Student's Achievement				
Excellent	16.7	16.3	57.8	22.2
Very Good	5.5	13.4	21	0
Good	11.2	12.6	17.2	22.2
Accept	5.5	4.8	2.4	22.2
Failed	61.6	52.9	1.6	33.4
X <sup>2</sup>			2.438	
P value			0.000	

### Discussion

Over the years, researchers have been investigating why some students acquire a deep, meaningful understanding of materials studied, whereas others have only a superficial grasp of the information presented. Often the latter kind of students may have high grades and high standardized test scores. What appeared to underlie the differences in these two groups of students was the differences in the way they approached learning of subject matter (*Ahmed, 2010*).

Nursing knowledge is continually increasing in amount and complexity which leads to exposed of nursing students to vast amounts of reading & studying. The result is that they do not know how to study effectively & resort to the traditional study method which based on rote memorization rather than meaningful learning and from that, the students considers the different concepts as isolated elements of knowledge. This lack of integration may be the main reason for difficulties in concept formation and application of acquired knowledge (*Fleming et al., 2011*).

Although the traditional method might lead to temporary reward, most information is forgotten within 4-6 weeks and is often accompanied by negative feelings. Thus, using of concept mapping as a study tool to build explicit links and relations between concepts can help students to learn more meaningfully (*Nian-Shing et al., 2008*).

Based on the foregoing, a quasi-experimental study was carried out to investigate the effectiveness of using concept map to improve maternity nursing students' achievement

As regard students' demographic characteristics of the students of the both groups, the results revealed that the mean age of the control group was 20.51±1.879 years and 20.62 ±.710 years in the study group. This is may be due to that the age of the under graduate nursing students enrolled in the faculty of nursing is between 17-21 years old. Females were in the majority for both groups with 76.3% in the control group and 83.3% in the study group. This could be explained by that in view of the typical distribution of nurses' population where nursing is largely a female dominated profession but from only a few years ago the male

## Study Effect of Apply Map on Students Perception to Antenatal Unit

---

students started to be enrolled in the nursing faculties but not as much as female students

The previous finding was supported by *Yekta&Nasrabadi (2010)* who studied "Concept mapping as an educational strategy to Promote meaningful learning" and found that most of the students (83.90%) were between 20-23 years old, 91.22% of them were female and also with the same line with *Atay&Karabacak (2012)* who found that females were in the majority for both groups with 85% in the experimental group and 87.5% in the control group.

On the contrary, *Khan et al. (2012)* found that the participants of the study comprised more males (82.4%) than females (17.6%). This ratio of male to female seemed to be unusual. The escalation in the number of males in nursing may be because of better earning opportunities now available to nurses in the country, as well as in other parts of the world

Concerning total students' knowledge regarding concept map, the present study showing highly statistical significance difference to study group compared with control group related to definition, importance and uses of the concept map as ( $P \leq 0.000$ ). This could be explained by the fact of exposure to learning by using concept map strategy made the students to be have theoretical background related to concept mapping.

Supporting the previous findings, the current study also revealed that the achievement of the study group who has theoretical knowledge about the concept map was highly statistical significance compared with the achievement of the control group who exposed to traditional strategy.

This is in accordance with *Tseng et al. (2011)* who study "The effectiveness of problem-based learning and concept mapping among registered nursing students" and stated that more identifying theoretical background of concept mapping allows nursing students to understand the errors in their understanding of concepts and then would increase their motives to correct such errors during drawing their maps. *Scahill et al. (2010)* also reported that concept mapping improves students' learning and academic achievement with a positive effect on their attitudes.

According to the Students' achievement in Antenatal Unite using Traditional & Concept Map Method, The study revealed that both methods could significantly increase the students' achievement at final exam but the students' achievement at final exam were significantly higher in the study group who used concept map as study tool.

This could be explained by that using concept maps as homework tools by the nursing students helps them to integrate their new knowledge with what they have learned previously. This method may help students to easily classify their knowledge, make them coherent to make a deeper understanding and so, it assists students reaching higher levels of cognitive learning rather than memorizing a series of concepts.

This interpretation was in the same line with *Zadeh et al. (2015)* who study the comparing the effect of concept mapping and traditional methods of skill teaching on nursing students learning in practical skills. The study revealed that both methods could significantly increase the mean score of students at posttest. However, students' posttest mean scores were significantly higher in the group taught via concept mapping method. Although both teaching methods used in

this study could enhance students learning, nurse educators are responsible to find, develop and implement more effective methods on students learning. This fact would be more important in the psychomotor domain that is more pertinent to patients' safety and the quality of nursing services.

As well as, the same finding on positive effect of concept mapping on learning was in line with some previous studies such as *Van Bon-Martens et al., (2014)*, *Gul and Boman (2006)* and *Aghakhani et al., (2015)*, *Harrison and Gibbons (2013)*, and *Koc, M. (2012)* showed that concept mapping would be effective if appropriately implemented. Therefore, concepts learned via this way can remain for a long-term and increase learning significantly.

Inconsistent with the previous findings, *Moattari et al. (2013)* reported that although concept mapping had some positive effects on learning, the effect on the students' achievement was not statistically significant which explained by that the concept maps might have disadvantaged high ability students because they might have had their own successful strategies which were not applied when they used concept maps.

Regarding the effect of gender on students' achievement using traditional & concept map method, the current study revealed that the achievement of male nursing students who using concept map method statically high compared with that of female nursing students. The significant interactions between concept mapping and gender can be interpreted in light of the cognitive style theory that categorizes males and females into different learning styles.

According to *Pritchard & Alan (2013)* who study ways of learning through different learning styles, males are field-independent learners while females are field-dependent learners. Field independent individuals, such as males, use active reasoning patterns that include cognitive structuring skills, while field dependent individuals, such as females, accept reality and may become passive learners.

This results were contradicted with *Kostovich et al., (2007)* who study "Learning Style Preference and Student Aptitude for Concept Maps" "The findings of this study indicate that learning style preference does not play a role in students' ability to perform well on concept maps also *Nejat et al. (2011)* who study the effect of concept mapping on approach to learning among nursing students, found no relationship between learning styles and learning effectiveness. These findings suggest that concept mapping is an appropriate teaching strategy for students of all learning style categories.

Although few studies are available in literature relating to gender in differential effect of concept mapping on the academic achievement, the previous results were contradicted with *Boujaoude & Attieh (2008)*, *Gerstner & Bogner (2009)* who reported the better achievement of female students rather than male students, meanwhile *Cheema & Mirza (2013)*, *Ahlberg & Ahoranta (2004)* & *Keraro et al. (2007)* stated no gender difference in the use of concept mapping for meaningful learning.

The current study showed that there is a high statistical significance between nursing students' achievement and their previous level of education, as the students' achievement of previous

## Study Effect of Apply Map on Students Perception to Antenatal Unit

secondary level of education using concept map method surpassed those of previous nursing Technical institute of Nursing education who exposed to the same learning strategy.

This could be explained by that nursing students of previous secondary education demonstrate greater cognitive skills because they exposed to more scientific materials as chemistry, biology and mathematics which depend more on the development of students' cognitive abilities like making decisions based on problem-solving and having the capacity to hold and manipulate information as all of those skills were more improved by using of concept map strategy. While technical nursing education depends more

### Conclusion

it. Based on the results of the current study, it can be concluded that Concept map is effective in Students' Perception to Antenatal Unit.

### Recommendation

In the light of the findings of the study, the following recommendations are suggested:

- Integrating concept mapping strategy as a method of teaching to students receiving obstetric and gynecology course
- It is important to offer an initial workshop for nursing educators regarding the theoretical and technical aspects of concept mapping, and it is essential to provide ongoing formative and summative feedback
- Further researches are still needed to explore the barriers that confront implementation of concept mapping in nursing education. Also the effect of

using concept mapping on nursing care plan & on practice regarding obstetric & gynecological department.

### Financial Support

No funding was received.

### Conflict of interest:

No Yes

### References

- Osman, T. (2011):** Egypt on the brink: from Nasser to mubarak, Yale University press, Revised edition.
- Ghojazadeh, M., Agaei, M., Naghavi-Behzad, M., Piri, R. & Hazrati, H., (2014):** Using concept Maps for nursing education in Iran: A systematic Review systematic Review; Res dev Med Educ, 2014, 3(1): 67-72. doi:10.5681/rdme.2014.014 <http://journals.tbzmed.ac.ir/rdme>
- Wilgis, M. & McConnell, J. (2008):** Concept mapping; an educational strategy to improve graduate nurses' critical thinking skills during a hospital orientation program. cognitive processing. The journal of Continuing Education in Nursing 39 (3): 119-126.
- Chawla, J., & Singh, G. (2015):** Effect of concept mapping strategy on achievement in chemistry of ix graders in relation to achievement motivation. Asia Pacific Journal of Research, 1(24), 53-65
- Onasoga, Olayinka A. et al (2012):** Factors influencing utilization of antenatal care services among pregnant women in Ife Central Lga, Osun State Nigeria Adv. Appl. Sci. Res., 2012, 3(3):1309-1315

- Daley, B.J. , Torre , DM. (2010):** Concept maps in medical education: an analytical literature review- Medical Education, 2010 - Wiley Online Library
- Wu P.H., Hwang G.J., Milrad M. , Ke H.R. & Huang Y.M.(2012):** An innovative concept map approach for improving students' learning performance with an instant feedback mechanism; British Journal of Educational Technology Volume 43, Issue 2, pages 217–232, March 2012
- Ahmed, O.Q. (2010):** The effect of Using Concept Mapping in teaching on the achievement of fifth graders in Science. Stud Home Comm. Sci, 4 (3).155-160
- Fleming, S., McKee, G. & Huntley-Moore, S. (2011):** Undergraduate nursing students' learning styles: A longitudinal study. Nurse Education Today, 31 (5). pp. 444-449. ISSN 02606917 (ISSN).
- Nian-Shing C, Kinshuk , Chun-Wang W, Hong-Jhe C. Mining e- (2008):** Learning domain concept map from academic articles. Comput Educ. 2008;50(3):1009–21
- Yekta, P. & Nasrabadi, N. (2010):** Concept mapping as an educational strategy to Promote meaningful learning, Journal of Medical Education Summer 2004 Vol.5, No.2
- Atay, S, & Karabacak, Ü. (2012):** Care plans using concept maps and their effects on the critical thinking dispositions of nursing students. International Journal of Nursing Practice; 18: 233–239.
- Khan, BA, Ali, F., Vazir ,N., Barolia ,R., Rehan, S. (2012):** Students' perceptions of clinical teaching and learning strategies: A Pakistani perspective; nurse education today - Nurse Education Today ;Volume 32, Issue 1, January 2012, Pages 85–90
- Tseng, H. C., Chou, F. H., Wang, H. H., Ko, H. K., Jian, S. Y., & Weng, W. C. (2011):** The effectiveness of problem-based learning and conceptmapping among Taiwanese registered nursing students. Nurse education today, 31(8), 41-46.
- Scahill SL, Harrison J, Carswell P. (2010):** What constitutes an effective community pharmacy?--development of a preliminary model of organizational effectiveness through concept mapping with multiple stakeholders. Int J Qual Health Care; 22(4):324–32.
- Zadeh , N.R., Gandomani, H.S., Delaram , M., Rasoul, & Yekta, Z.P. (2015):** Comparing the Effect of Concept Mapping and Conventional Methods on Nursing Students' Practical Skill Score, Nursing and Midwifery Studies; 4(3): e27471.
- Van Bon-Martens MJ, van de Goor LA, Holsappel JC, Kuunders TJ, Jacobs-van der Bruggen MA, te Brake JH, et al. (2014):** Concept mapping as a promising method to bring practice into science. Public Health; 128(6):504–14.
- Gul, R.B. & Boman, J.A. (2006):** Concept mapping: A strategy for teaching and evaluation in nursing education. Nurse Educ Pract; 6(4):199–206.
- Harrison, S. & Gibbons, C. (2013):** “Nursing Student Perceptions of

---

### Study Effect of Apply Map on Students Perception to Antenatal Unit

---

- Concept Maps: From Theory to Practice". *Nursing Education Perspectives* 34(6): 71-77.
- Aghakhani N. ; Nia H. S. ; Eghtedar S. ; Torabizadeh C. (2015):** The Effect of Concept Mapping on the Learning Levels of Students in Taking the Course of "Nursing Care of Patients With Glandular Diseases Subject" in Urmia University of Medical Sciences, Iran ; *Jundishapur J Chronic Dis Care.* 2015 April; 4(2): e28387 Published online 2015 April 20
- Koc, M. (2012):** Pedagogical knowledge representation through concept mapping as a study and collaboration tool in teacher Education ; *Australasian Journal of; Educational Technology* 2012, 28(4), 656-6
- Nejat, N, Kouhestani. HR, Rezaei, K. (2011):** [The effect of concept mapping on approach to learning among nursing students]. *Hayat* 2011;17:22-31
- Pritchard, A. (2013):**"Learning styles". *Ways of learning: learning theories and learning styles in the classroom* (3rd ed.). Milton Park, Abingdon, Oxon; New York:Routledge. pp. 46–65.
- Kostovich, C. T., Poradzisz, M., Wood, K., & O'Brien, K. L. (2007):** Learning style preference and student aptitude for concept maps. *Journal of Nursing Education*, 46(5): 225-231.
- Moattari M, Soleimani S, Jamali Moghaddam N, Mahbodi F. (2013):** [The effect of clinical concept mapping on discipline based critical thinking of nursing students]. *Iranian Journal of Medical Education* 2013;12(10):756-67.
- BouJaoude S. &Attieh M. (2008):** The Effect of Using Concept Maps as Study Tools on Achievement in Chemistry *Eurasia Journal of Mathematics, Science & Technology Education*, 2012, 4(3), 233-246
- Ahlberg, M. &Ahoranta, V. (2004):** Six years of design experiments using concept mapping – At the beginning and at the end of each 23 learning projects
- Gerstner, S. & Bogner, F. X. (2009):**Concept map structure, gender and teaching methods: An investigation of students' science learning. *Educational Research*, 51(4), 425-438.<http://dx.doi.org/10.1080/00131880903354758>.
- Cheema, AB. & Mirza, MS.(2013):**Effect of Concept Mapping On Students' Academic Achievement; *Journal of Research and Reflections in Education* December 2013, Vol.7, No.2, pp 125 -132.
- Keraro, F.N., Wachanga, S. M. &Orora, W. (2007):** Effect of cooperative concept mapping teaching approach on secondary school students' motivation in Biology, GuchaDist: Kenya. *International Journal of Science and Mathematics Education*, 5: 111-124.