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## The Creation Of A Concept Mapping Care Plan For Evaluating Students' Clinical Performance

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### Abstract

The study aims to use concept mapping as a teaching approach in the clinical setting. The concept mapping care plan (CMCP) was developed, then validated using the Delphi technique. There were 218 respondents who participated in the survey. This study used pre and post-tests. The mean score of CMCP during clinical practices for the experimental group was 65.23 as compared with the control group which was 59.33. There were significant differences in the clinical performance of both groups. CMCP is a practical assessment tool for nursing educators to prepare nursing students to think critically and perform effectively after graduation.

Keywords: Concept mapping care plan (CMCP), clinical practices, nursing students

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### 1.0 Introduction

Attachment to a clinical setting is an essential part of nursing education. Students gain more experience, responsibility, and understanding of inpatient care due to their involvement in clinical practices. The clinical learning environment has a significant impact on students' learning and professional development; when students take care of patients that need extensive nursing interventions, they experience engagement in learning through nursing care (Manninen, Scheja, Henriksson., & Silén, 2013). However, Ab Latif and Mat Nor (2016) reported that the most stressors perceived by nursing students are stress from clinical assignments and the workload of nursing care plans or nursing process tasks. Therefore, a concept mapping care plan is helpful for students' preparation for clinical practices. It is supported by Harrison and Gibbons (2013), who stated that concept mapping makes the students recognize how factors are connected to inpatient care and anticipate the problems. Concept mapping care plan is related to the expectation that today's nursing students must master a constantly expanding body of knowledge and apply complex skills in a rapidly changing environment. A concept mapping care plan is a good assessment tool for nursing educators to prepare nursing students for better critical thinking and is expected to function effectively after graduation. The aim of using concept mapping as a teaching approach in the clinical setting is for students to be able to integrate theoretical knowledge and apply it in the clinical setting. The learning process will become more meaningful as a consequence of this

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approach. The researcher wants to create a concept mapping care plan to evaluate nursing students' academic performance in clinical settings.

## **2.0 Literature Review**

Concept mapping care plan was found to enhance the nursing students' knowledge and understanding and improve the quality of clinical education. By using concept mapping, the students gained content knowledge and enhanced the development of problem-solving, critical thinking, communication skills, and active learning (Erasmus, 2013).

### **The advantages of concept mapping care plan in clinical practices**

#### **i. Enhanced critical thinking**

Concept mapping care plan enhances the critical thinking of the nursing students, which allows the students to analyze, make an assessment, and evaluate data that reflect patient care. It will change the students from passive learners to active learners in the clinical setting (Ab Latif, Dahlan, Abdul Mulud & Mat Nor, 2017). It is supported by Wheeler and Collins (2003), who stated that concept mapping is one example of improvement of critical thinking because, during the construction of the maps, the students draw the map of content, and this allows them to use their cognitive skills such as analysis, evaluation, and reasoning. Via concept mapping care plan encouraged the nursing students to think more independently and gave them more confidence in practices in the clinical area because all the respondents were assigned to find and provide personnel nursing care to the patients.

#### **ii. Students make a self-performance assessment**

By applying the concept mapping care plan, nursing students have the opportunity to assess their performance in clinical practices. Students can self-evaluate or peer-evaluated concept maps as a way of building the professional skills of self-assessment and peer evaluation (Billings & Halstead, 2005). Concept mapping as a student-directed strategy, promotes the use of self-monitoring, increases self-efficacy, and leads to better achievement of the students (Chulart & DeBacker, 2004). Concept mapping is to be built by a student who requires students to make links between concepts such as cross-links between concepts. In the clinical area, concept maps can be evaluated by: the comprehensiveness of data assessment, if data are linked to the correct diagnoses and problems, the suitable nursing interventions and treatments are specific and relevant, and if the relationships among the concepts are indicated and accurate (Oermann, Saewert, Charasika, & Yarbrough, 2009).

#### **iii. Promote meaningful learning in clinical practices.**

Concept mapping care plans can promote meaningful learning in clinical practices (Ab Latif, Dahlan, Abdul Mulud & Mat Nor, 2017). The learners involved in the meaningful learning process will feel the emotional significance of understanding, which gives confidence to the learners when comprehending the concepts (Novak & Gowin, 1984). Using a concept mapping care plan also gives the students a holistic view of the client's health status by looking at the priorities of the clients' complaints. Concept mapping of patient problems allowed students and instructors to see interrelationships in inpatient data, analyze the patient data, and plan comprehensive nursing care. Using a concept mapping care plan also, the students easy in identify the problem having by the patient because it can present a visual representation of patients and make a plan of care systematic and practical.

#### **iv. Stimulate the students' cognitive thinking**

Concept mapping care plan enhanced nursing students' understanding and confidence in a clinical setting. This may lead to preparing nursing students to think critically in clinical settings. Hsui(2004) reported that using concept mapping makes the students understand the relationships between patient data and disease processes and provides students a "big picture" to give care to the patients. The approach to concept mapping is unique because it is based on a nursing model of health and illness and places the client who requires nursing care at the center of the map (Taylor & Wros, 2007). Using concept mapping stimulates the students' cognitive thinking because it enhances the understanding of the clients' needs and relates to the care of the clients. Chabeli (2010) reported that concept mapping is an integral teaching method to facilitate metacognitive thinking and encourage a deep approach to learning.

#### **v. Increased responsibilities in the nursing care**

Nurses are responsible for the care they provide to their patients. The nurses must be responsible for their patients' nursing care and individually accountable for their practice. Concept mapping care plan is a method to improve health care delivery. It includes all the assessments that need to the nurses done on their patients. For example, based on medical diagnosis, the nurses can get nursing to diagnose from data objectify and subjective data patient. After getting the nursing to diagnose, the nurses can identify a goal for nursing diagnosis and then implement the nursing intervention. Then, the nursing evaluation will be done to evaluate whether the nursing intervention is effective. Concept mapping care plan helps the nurse provide high-quality care to their patients based on the assessment.

### 3.0 Methodology

This study used a two-group quasi-experimental design with pre-and post-tests. A multi-stage sampling design was used to choose a representative sample for the studies. The population of the study was chosen based on zones from four nursing colleges. ILKMM Kubang Kerian (Kejururawatan), Kelantan, ILKMM Pulau Pinang, Penang, Kolej Sains Kesihatan Bersekutu (KSKB) Sungai Buluh, and ILKMM Melaka are all located in the East Zone. Based on the random sample, the students were selected and assigned as control (KSKB Sungai Buluh and ILKMM Melaka) and experimental group (ILKMM Kubang Kerian and ILKMM Pulau Pinang). Permission from all directors of Nursing from four nursing colleges was obtained. Using the sample size from Krejcie & Morgan (1970) with a confidence level of 95%, the sample size required would be 218 respondents. The experimental and control groups consisted of 109 respondents, respectively. The descriptive values of items were expressed as means, standard deviations, frequencies, and percentages, after ensuring the normal distribution of the variables (Kolmogorov- Smirnov test). The distribution of differences is normally distributed. Paired t-test was performed to compare the mean difference between pre and post-test scores among experiment and control groups. P-values less than 0.05 were interpreted as significant.

#### 3.1 Validation of concept mapping care plan using Delphi technique

Three rounds Delphi technique was used in seeking a consensus on a concept mapping care plan. Ten expert panels were involved in making sense of the consensus. Participants were asked to rate the categorized responses from round 1 on a scale of 1 to 5, with 1 being "Very Irrelevant" and 5 being "Very Relevant". Statistical Package for the Social Science for Windows (SPSS) version 23.0 software was used to analyze the data collection. A paired t-test was performed to compare the concept mapping care plan between the experiment and control groups during clinical practice. P-values less than 0.05 were interpreted as significant. The concept mapping care plan was scored based on three categories: adapted from Ainsley (2003): <33.3%: Low; >33.3-66.6%: Moderate and >66.6%: High. This criterion for grading is evaluated based on nine components, namely: (1) Clinical manifestation (5%), (2). Risk factors and etiologist (5%), (3). Investigation and result (5%), (4). Medical treatment (5%), (5).Nursing diagnosis (subjective data and objective data) (10%), (6). List of Nursing diagnoses (5%), (7).Nursing intervention (included medication) (40%), (8). Nursing evaluation (5%) and (9). Health education (20%).

The Delphi technique is a widely used and accepted method for gathering data from participants within the domain of expertise. The objective of this study is to discuss the process of the three rounds Delphi technique in seeking a consensus on the concept mapping care plan. CMCP was validated by a ten-member expert panel with six from the University Sains Malaysia (USM) and four from Kubang Kerian Nursing College. They have worked as a medical lecturer and a nursing lecturer, and they have more than five years of professional experience. In this technique, the experts were allowed to consider the bias and objections of other group members in an environment free from bias, and they were free to express their opinion. The Delphi technique was used to collect data, and the validity of the survey was enhanced due to the use of experts in the validation process (Dalkey, 1969; Wilhelm, 2001). The Delphi process can be continuously iterated until consensus is determined to have been achieved. The analysis of consensus data of the experts was done based on the median, interquartile range, and quartile deviation on Round 1, 2, and 3 data. In conclusion, the concept mapping care plan had met a consensus when all the statements got a medium consensus above 4, which reported that the level of importance of the statements was high and low if the median value was less than 3.5.

#### 3.2 Study ethics

Before carrying out this research project, an approval letter was sent to Bahagian Pengurusan Latihan (BPL) and Directors of Nursing Colleges (Institut Latihan Kementerian Kesihatan Malaysia (ILKMM) for consent. The researchers explained the aim and procedure of the study to the respondents. The researchers also presented to the respondents that their answers were confidential and only used for academic research. Written informed consent from all participants was being acquired.

### 4.0 Findings

#### 4.1 Results of the validation process

In this study, the researcher used a formula from Norizan(2003) as a guideline to get the consensus and importance of items(refer to table 1.1). The value of the interquartile range using the formula (Q3-Q1) was determined using Microsoft SPSS version 23.0 and reported in the Round Three (R3) questionnaire. The data from Round Three (R3) were treated similarly. The formula for identifying deviation (QD) is as follows:

$$\begin{aligned} \text{QD} &= \frac{\text{Inter-quartile range}}{2} \\ &= \frac{(Q3-Q1)}{2} \end{aligned}$$

In the validation process to get the consensus on the concept mapping care plans for this study, for the first, second, and third Delphi rounds, all the Quartile Deviation (QD) of the statements was less or equal to 0.5 (QD≤0.5), it indicates that the level of consensus was high. In other words, all expert panels' responses lie on a scale of 5 (Very relevant). The median score was used to analyze the level of

consensus among experts, and the result shows that in all three rounds of Delphi, the medium result more than 4. It reported that the level of importance of the statements was high. It is shown in table 1.2.

Table 1.1: Level of consensus and importance

Quartile Deviation(QD)	Level of Consensus	Median	Level of Importance
Less or equal to 0.5 (QD≤0.5)	High	4 and above (M≥4)	High
More than 0.5 and less than or equal to 1.0 (0.5<QD≤1.0)	Moderate	3.5 and less (M≤3.5)	Low
More than 1.0 (QD≥1.0)	Low and no consensus	-	-

Formula by Norizan (2003) on classifications of consensus was determined at three levels

Table 1.2: Consensus in concept mapping care plan through three rounds Delphi Technique.

Item	Rounds of Delphi								
	Round 1			Round 2			Round 3		
	Median	Mean	QD	Median	Mean	QD	Median	Mean	QD
Statement 1	5.0	4.7	0.5	5.0	4.7	0.5	5.0	4.7	0.5
Statement 2	5.0	4.7	0.5	5.0	4.7	0.5	5.0	4.7	0.5
Statement 3	5.0	5.0	0	5.0	4.7	0.5	5.0	4.7	0.5
Statement 4	5.0	5.0	0	5.0	4.4	1	5.0	4.7	0.5
Statement 5	5.0	5.0	0	5.0	4.4	1	5.0	4.7	0.5
Statement 6	5.0	5.0	0	5.0	4.7	0.5	5.0	4.7	0.5
Statement 7	5.0	4.7	0.5	5.0	4.1	1.5	5.0	4.7	0.5
Statement 8	5.0	5.0	0	5.0	4.7	0.5	5.0	4.7	0.5
Statement 9	5.0	5.0	0	5.0	4.7	0.5	5.0	4.7	0.5

#### 4.2 Descriptive statistics on academic performance of nursing students during clinical practices.

Table 2 shows that the respondents' data were divided into three groups of scores average depending on student grade level. The experimental group shows a higher grade score with the student who got a grade high was 52(23.9%) compared with a control group that only got 37(17.0%). Meanwhile the control group shows higher score in Moderate grade (n=72, 33.0%) compared than experimental group (n=57, 26.1%). However, no respondents get low grades.

Table 2: Descriptive analysis for concept mapping care plan scores at the clinical practice among experimental and control groups (N=218)

Concept mapping care plan scores	Experimental group		Control group	
	n	%	n	%
Low(<33.3%)	-	-	-	-
Moderate (>33.3-66.6%)	57	52.3	72	66.1
High(>66.6%)	52	47.7	37	33.9

#### 4.3 Inferential statistics on academic performance of nursing students during clinical practices.

Table 3 indicates that students taught through concept mapping (experiment group) had higher mean gain scores on concept mapping care plans at clinical practices compared to those using the lecture method(control group). Using descriptive statistical analysis to compare the means of the two groups on concept mapping care plan during clinical practice, the mean score of the experimental group was 65.24, SD= 9.28 compared with the control group; the mean was 59.33, SD= 11.26. Using a paired t-test revealed that there was a statistically significant difference between experimental and control groups, where t (4.54, 108) and p-value <0.05. Thus, it indicated that the experimental group had higher concept mapping care plan scores than the control group. Hence, the alternative hypothesis states there is a significant difference between the mean gain score of students' taught through concept mapping and the lecture method on academic performance of diploma nursing students during clinical practice.

Table 3: Comparison of mean scores of concept mapping care plan during clinical practice between experiment and control groups (n=218)

Test	Group	N	Mean	SD	df	t-value	p-value
Concept Mapping Care Plan	Experimental	109	65.24	9.28	108	4.54	0.01*
	Control	109	59.34	11.26			

\*p<0.05 significant

## 5.0 Discussion

### 5.1 Consensus in concept mapping care plan through three rounds Delphi technique.

The Delphi technique is a widely used and accepted method for gathering data from participants within the domain of expertise (Ab Latif, Mohamed, Dahlan & Mat Nor, 2016). The Delphi process can be continuously iterated until consensus is determined to have been achieved (Ab Latif, Mohamed, Dahlan & Mat Nor, 2016). In the validation process, the researcher used three rounds of Delphi techniques to validate the concept mapping care plan (9 items). The Delphi techniques result shows that the Quartile Deviation (QD) of the statements was less or equal to 0.5 ( $QD \leq 0.5$ ), which indicates that the level of consensus was high. In other words, all expert panel responses lie on a scale of 5 (Very relevant).

### 5.2 To determine the effectiveness of concept mapping care plan on academic performance of diploma nursing students during clinical practices.

The result of the study reported that students from the experimental group had higher gains in concept mapping care plan scores and performed better than students taught through the lecture method. The findings of this study indicate that the use of concept mapping strategies significantly improves students' critical thinking skills as determined by concept map care plan scores and academic achievement as measured by post-test scores. In nursing education, concept mapping has been used as a teaching strategy to provide students the opportunity to visualize and integrate theories with the nursing process. Concept mapping of patient problems allowed students and instructors patient to see interrelationships in inpatient data, analyze the patient data and plan comprehensive nursing care. Previous studies recommend that to replace traditional care plans or nursing care plans with concept-mapped to help students learn how patients' various problems are connected (Chabeli, 2010; Kostovich et al., 2007 & Abel & Freeze, 2006). It can seem that in the oversea hospital, the concept map care plans have been implemented.

## 6.0 Conclusion and recommendation

This result indicates that in clinical practice, the need for innovative educational methods to increase critical thinking. This study exposed the nursing students to the used concept mapping care plan as a replacement for a nursing process that has been practiced before in the clinical setting. Therefore, to apply this CMCP in the clinical setting, the nursing curriculum needs modification and revision to improve the students' ability in practiced and applied the concept mapping care plan. By using a CMCP the nursing students will first analyze every problem that has by the patient and try to solve the problem by using appropriate decision making. This will develop critical thinking and "think out of the box. A CMCP is a good assessment tool for nursing educators to prepare nursing students for better critical thinking and is expected to function effectively after graduation. The goal of concept mapping care plan as a teaching strategy during the clinical practices is for the students can integrate the knowledge from theory and implement this knowledge in the clinical setting. The concept mapping care plan method is akin to the nursing process phases such as assessment, planning, implementation, and evaluation after the nursing intervention was done. This process also was significant with the critical thinking process. The CMCP has the potential to improve students' problem-solving skills in complicated situations. This is following the vision and objective of the Ministry of Health's Institut Latihan Kementerian Kesihatan Malaysia (ILKKM), which is to produce competent and knowledgeable nurses.

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## Paper Contribution to Related Field of Study

CMCP helps nursing students by allowing them to determine the problems of patients, improve nursing students' knowledge and understanding, and improve the quality of clinical education. CMCP can increase students' problem-solving skills in situations that are challenging. The CMCP will make it easier for the students to understand and this will reduce the gap between theory and its application into practice among the nursing students.

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