**The Effect of Post Clinical Debriefing in Enhancing Clinical Decision-Making Abilities of Diploma Nursing Students:**

**A Mixed-Method Study**

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**Abstract**

**Objective**: This study aimed to examine the effect of using post clinical debriefing as an educational intervention in enhancing the clinical decision-making ability among diploma nursing students. This was because making improvement in nursing students’ clinical decision making skills has been a difficult academic outcome to achieve, despite considerable research and a major focus topic for nursing education.

**Method:**Amixed-method study using triangulation design was used. Analogy-guided learning and guided reflection were included in post clinical debriefing as treatment. Quantitative method using quasi-experimental study with pre-test & post-test was conducted among 133 Second Year Semester One Diploma Nursing students (experimental n=64; control n=69) in a public university. Two instruments were used to measure their context specific and general clinical decision-making skills and a satisfaction questionnaire was used to obtain their perception of the treatment. Qualitative method used focus group interviews to explore any factors that might have effect on their clinical decision making beside PCD.

**Finding**: Significant difference in the intervention group was found in the dimensions of “hypothesis generation” , “cue utilisation” and “data gathering” within the framework of the nursing process which supported the hypotheteco-deductive diagnostic reasoning theory. Supportive clinical environments and multiple patients experience were factors found to enhance students’ diagnostic reasoning skills. A Model of Factors Enhancing Clinical Decision Making for Diploma Nursing Students was synthesized based on the data of this study as a guide for future educational intervention.

**Background**

Nurses’ expertise in clinical decision making plays a significant role in the consequences of patient care. Deficiencies in this skill can result in “failure-to-rescue” (Aiken, Clarke, Cheung, Sloane & Silber, 2003).Teaching must starts at the student level to encourage the identification and controlling the worsening patients, the practice of obligation in coordination and active communication (Bright, Walker & Bion, 2004). An issue faced by nursing education is that the present day pedagogical methods failed to enable the advancement necessary in the clinical decision-making abilities. The students are often deficient in scientific reasoning required to act correctly in the life-threatening circumstance, even though they have decent content understanding and satisfactory technical expertise (del Bueno, 2005).A study done by The Nursing Task Force (MOHE, 2009/2010) on the basic nursing competencies for new graduates of diploma programs revealed that problem solving and decision-making abilities were lacking.

**Objectives**

The main purpose of this study isto test the effect of this educational intervention in the enhancement of student learning and development of clinical decision-making ability. The secondary purpose was to explore any factors that may influence the clinical decision-making skill of students beside the use of the post clinical debriefing.

**Method**

A mixed method study using triangulation design study was conducted to determine the effect of using post clinical debriefing.For the quantitative method, a “before and after” quasi-experimental study with untreated comparison group design with pre-test & post-test (Burns & Grove, 2001) was used. Dependent variables measured were specific clinical decision-making abilities which were problem sensing/cue utilization, hypothesis generation, data gathering, priority setting of patient problems, and perception of general clinical decision makingbehavior. Clinical decision-making abilities were used as a measure of the effectiveness of the teaching method. For the qualitative method, focus group interviews were used to gather data from students, to explore factors that influence their clinical decision making after the treatment of PCD.The aim was “to obtain different but complimentary data on the topic” to understand the research problem in depth (Morse, 1991, p122 quoted in Creswell & Plano Clark, 2007).Quantitative approach is associated with the philosophy of positivism and qualitative approach advocates a more “artistic” approach such as postmodernism. More researchers are adopting pragmatism as the best philosophical foundation for mixed methods research. Pragmatists recommended that researchers should use whatever works. World view and inclinations about methods should not take precedence. Researcher should decide the research method that most readily aligns with the research problem. Mixed methods studies serve several purposes including triangulation, complementary, initiation, development and expansion (Fraenkel, Wallen & Hyun, 2012).

A purposive sample of an intact class of second year nursing students from a public university which met the inclusion criteria was recruited. The class consisted of 170 students who had completed the Medical Surgical Nursing II Module. Approval for the study was obtained from the Research Ethical Committee of the public university concerned and from the Principal of School of Nursing. Informed consent was obtained from the students after explaining the study to the potential study participants. Students selected were assigned to two groups based on their clinical teachers after a pretest using application test.Treatment protocol consisted of two parts: reflection- on- action from clinical experience and the structured debriefing based on analogical reasoning process of case comparison.Reflection- on- action from clinical experience was conducted at the beginning of the debriefing session.Reflection- on- action was to assist students in learning from their experience through the recognition of the meanings of their actions. The case comparison method involved the use of specific nursing diagnosis to compare and contrast data or information across different patients of their classmates based on multiple students’ real-world experience.The researcher then highlighted the similar nursing diagnosis with the different etiologies and signs and symptoms of their patients. By doing so, the students were facilitated to compare the similar nursing diagnosis between the patients under their care. At the end of the session, the students were asked to construct a “model case” This “model case” would then be formed as the “mental model” for that nursing diagnosis for subsequent recall to apply when they encounter patients with the similar nursing diagnosis later.There were five instruments used in the quantitative study. They were the demographic data sheet, Clinical Decision Making in Nursing Scale, pre-test, post-test and satisfaction survey questionnaire.

Five focus group interviews were used in the study to collect information on the factors that might influence the CDM of the students beside the use of PCD. The interviews were conducted after the completion of the study for each experimental sub-group of students.

**Findings**

A total of 133 students (64for intervention group and 69 forcontrol group) completed the application test and CDMNS instrument (pretest) before and after the study (post- test). Attrition rate for intervention group was 8.6% and control group was 1.4%. Students scored less (M=128.45, SD=8.85) in CDMNS which was used to measure the perception of CDM abilities after the treatment than before the treatment M=129.51,SD=8.46). PCD had no effect on the overall perception of CDM ability of the students after the treatment. The lower post study mean scores in CDMNS might be due to the possibility that existed early in their training, the nursing students did not have enough experience to make an accurate assessment of their clinical decision making ability. The result of the application test which was to measure the specific CDM abilities showed that there was significant difference between the pre-test scores and post test scores in all the three dimensions – hypothesis generation, cue utilization, data gathering for both the objective questions and open-ended questions. Results suggested there was a significant difference between the gain scores of the application test between the experimental and control group (Table 1). Null Hypothesis stated thatthere is no difference in the pretest scores, post test scores and gain scores of application test between the PCD treatment and the control groups*.* Therefore the null hypothesis was rejected.

Table 1

Mean, Standard Deviation, and *t* Test for paired Samples for Difference between pretest scores and post test scores (gain scores) of Application Test

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  | M | SD |  |  |
|  | Objective QuestionsDimension  | Pre-test ScoresApplication Test  | Post- Test Scores Application Test | Pre-test ScoresApplication Test  | Post- Test Scores Application Test | t | *p*value. |
| a | Hypothesis Generation | 4.68 | 5.35 | 0.94 | 1.14 | -6.09 | 0.00\* |
| b | Cue Utilization | 5.09 | 5.56 | 1.87 | 1.84 | -2.84 | 0.00\* |
| c | Data Gathering | 5.53 | 7.08 | 2.43 | 3.84 | -4.78 | 0.00\* |
| d | Priority Setting | 1.05 | 1.28 | 2.04 | 2.18 | -1.00 | 0.31 |
|  |  |  |  |  |  |  |  |
|  | Total Score For Objective Questions | 17.0 | 20.4 | 4.89 | 7.08 | -5.86 | 0.00\* |
|  |  |  |  |  |  |  |  |
|  | Open-Ended QuestionsDimension  |  |  |  |  |  |  |
| a | Hypothesis Generation | 5.90 | 6.35 | 1.41 | 1.57 | -2.51 | 0.01\* |
| b | Cue Utilization | 2.12 | 2.54 | 1.40 | 1.28 | -2.86 | 0.00\* |
| c | Data Gathering | 0.92 | 1.31 | 1.26 | 1.36 | -2.96 | 0.00\* |
| d | Priority Setting | 1.80 | 2.82 | 2.41 | 2.48 | -4.39 | 0.00\* |
|  |  |  |  |  |  |  |  |
|  | Total Score For Open Ended Questions | 11.4 | 13.7 | 4.23 | 4.79 | -5.12 | 0.00\* |
|  |  |  |  |  |  |  |  |
|  | Overall Score(Objective+ Open Ended Questions) | 27.1 | 32.2 | 6.35 | 8.84 | -6.56 | 0.00\* |

\*p< .05

The satisfaction survey questionnaire showed that the students who received the treatment of post clinical debriefing had a positive perception on the post clinical debriefing. This was demonstrated by the mode score of 4 for all the 16 items asked (Table 2). The total percentage scores of agree and strongly agree ranged from highest 82.9% to lowest 56.2%. Four items- 1, 2, 9, and 10 scored the highest percentage of 82.9%; whereas item 6 &15scored the lowest percentage of 70.3% and 56.2% respectively.

Table 2

Percentage of Students’ Satisfaction Related To Use Of Post Clinical Debriefing (n=64)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  1(%) | 2(%) | 3(%) | 4(%) | 5(%) |
| 1 | The teaching methods used in these reflective sessions were helpful and effective | 4.7 | 6.3 | 6.3 | 68.8 | 14.1 |
| 2 | The debriefing sessions provided me with a variety of learning activities to promote my learning in clinical areas | 1.6 | 4.7 | 10.9 | 68.8 | 14.1 |
| 3 | I enjoyed how the lecturer conduct the reflective sessions | 4.7 | 7.8 | 15.6 | 59.4 | 12.5 |
| 4 | The way the lecturer conducted the debriefing sessions was suitable to the way I learn  | 3.1 | 7.8 | 15.6 | 57.8 | 15.6 |
| 5 | The lecturer used helpful examples to conduct the sessions | 3.1 | 4.7 | 15.6 | 51.6 | 25.0 |
| 6 | The debriefing sessions covered critical content necessary for the mastery of the clinical component of the subject  | 3.1 | 6.3 | 20.3 | 54.7 | 15.6 |
| 7 | The debriefing sessions provided me the opportunities to reflect on my experience in the ward and the meaning of my actions  | 3.1 | 6.3 | 9.4 | 54.7 | 26.6 |
| 8 | The debriefing sessions allowed me to seek help when I face difficulty in understanding the clinical application of concepts covered in the subject  | 3.1 | 3.1 | 21.9 | 53.1 | 18.9 |
| 9 | The debriefing sessions has taught me to use reflection on my experience for learning  | 1.6 | 4.7 | 10.9 | 57.8 | 25.0 |
| 10 | The teaching method helped me to apply knowledge learnt in classroom to my practice in the ward | 6.3 | 1.6 | 9.4 | 48.4 | 34.4 |
| 11 | The structured format of the debriefing is helpful and effective in providing a direction for me to learn | 3.1 | 9.4 | 9.4 | 60.9 | 17.2 |
| 12 | The lecturer is skilful in facilitating the debriefing sessions | 1.6 | 10.9 | 12.5 | 56.3 | 18.9 |
| 13 | The lecturer is able to establish a trusting relationship with the group | 4.7 | 9.4 | 14.1 | 56.3 | 15.6 |
| 14 | The lecturer uses many prompting questions to encourage the group to answer and participate in the discussion  | 3.1 | 6.3 | 18.8 | 45.3 | 26.6 |
| 15 | The timing of the sessions are suitable for effective reflection  | 4.7 | 10.9 | 28.1 | 40.6 | 15.6 |
| 16 | One hour is adequate for debriefing after posting  | 6.3 | 4.7 | 17.2 | 57.8 | 14.1 |

1= strongly disagree, 2=disagree, 3=undecided, 4=agree, 5=strongly agree

Four themes were identified and associated as factors influencing with nursing students’ clinical decision making: (1) gaining confidence in their nursing skill*s; (2)* connecting with patients; *(3)* building relationships with staff. (4) understanding the clinical picture*;*

**Discussion**

 Formulating nursing diagnosis was operationalized to be CDM ability in this study. Application test scores as outcome measure was used to assess the extent clinical decision making ability differed between students in the experimental and control groups. The application test provided the main assessment of the mean difference between groups. Hypothesis was used to answer the question: The statistical significance difference in the pretest scores between the two groups indicated there might be some potential bias in the selection of samples. Although knowledge was a main factor in clinical decision making ability in the literature (Benner, 1984; O’Reilly, 1993), GPA had not been studied to be a predictive factor in clinical decision making. This might explained the low pre-test scores among the experimental group despite having a higher mean GPA compared to the control group. There was statistical significant difference found between the pretest and post test scores (gain scores) in both the objective questions and open-ended questions. The null hypothesis was rejected as the results showed there was statistical significant difference found between the pretest and post test scores (gain scores) between the two groups.

The mean gain scores (post test scores - pre-test scores) of all four dimensions for the experimental group were higher than that of the control group in both the objective and open ended questions. There was significant difference between the groups in the all the dimensions for both objective questions and open ended questions. The experimental group started with a lower mean pre-test scores and came quite close to the control group in the mean post-test scores with a higher mean gains scores of application test compared to the control group. The significant level of *p*<0.05 for the dimensions of “hypothesis generation”, “cue utilization” and “data gathering” could be said to support the findings of Elstein et al’s (1978) study suggested that “clinicians” produced hypotheses early and then inferred the data in the light of these hypotheses as the diagnostic process progressed.

Experiences gained from time spent in formulating nursing diagnosis and reflection on practice not only facilitated nurses’ confidence in performing diagnostic tasks, but also enhanced their intuitive insights by sharpening their recognition of patient characteristics (Schraeder & Fiscer, 1987; Alexander, 1991; Jenny & Logan, 1992; Benner, Tanner & Chesla, 1996; Radwin, 1998).The findings of the current study supported the efficacy of using post clinical debriefing as educational intervention in enhancing the clinical decision making ability of third semester diploma nursing students. The findings extend the body of research that supports engaging students in learning principles or concepts by explicitly comparing structural similarities enhances retention and transfer of the principles and concepts to novel situations through the use of analogy-guided learning (Gentner, 1989; Hepner, 1989; Gentner et al, 2003; Edelen, 2009).

There are two main difficulties in relation to learning analogous reasoning. One is about noticing a potential analogy, and the other, closely related problem, is that of how analogies are accessed in memory. Noticing an analogy is difficult because it will differently be encoded in a different context from that of the presenting problem. The challenge is to make the connection between the two bodies of information from dissimilar words and sentences. This was facilitated by the clinical teacher in helping the students to notice the analogy during the post clinical debriefing as was carried out in the current study. When the students mapped the presented nursing diagnosis directly to a previous nursing diagnosis learnt in classroom, an analogous answer was produced. A problem schema may be induced as a result of this process. Without an appropriate schema it is relatively difficult to recall a previous analogue when presented with a new problem (Gick & Holyoak, 1983). The students in the current study were able to retrieve without difficulty a prior analogue of similar nursing diagnosis learnt in their Medical and Surgical Nursing II Module which included nursing diagnoses for patients. The use of the specific nursing diagnoses during the debriefing treatment allowed the researcher to facilitate the detecting and recovery of the analogue by the students. In contrast to previous studies, this study incorporated analogy guided learning experiences within the real clinical environments, as opposed to simulated environments in other studies (Hepner, 1989; Newsome, 1989; Gentner et al, 2003).The findings were consistent with studies reviewed demonstrating that explicit case (specific nursing diagnosis in this study) comparison using analogy reasoning process enhanced cue recognition and complexity in mental models (Hepner, 1989; Newsome, 1989; Gentner et al 2003; Edelen, 2009).

The student encountered a novel situation in the real clinical environment and contributed to the group debriefing by reflecting on ways her experience related to the nursing diagnoses that were being discussed. Students were guided in reflecting and identifying the relevant data from their individual experience of patients related to the diagnosis being discussed. During reflection students recalled knowledge learnt in classroom with regard to the nursing diagnosis being discussed and related the knowledge to the experience with the real patients in the clinical areas. A result of the reflective process was the identification of cues and data from the student’s individual experience that contributed to the unified case development. The unified case was the result of assimilation and accommodation of the reflective process. The unified case became part of a student’s existing mental model of the learnt nursing diagnosis, Thereby increasing the mental model complexity for future situations. When encountering novel situation related to the learnt nursing diagnosis, the students recalled the unified case and integrated knowledge from that case within the context of the novel situation to make clinical decisions. The result was ever increasing complexity of mental models to use in the clinical decision making process and increased decision making ability and accuracy. Students’ ability to recognize novel situation as analogous to their existing mental model increases as they gain more experience.

Nursing diagnoses were used as an appropriate schema to help students to recover earlier analogues when presented with new problems of their patients in the clinical areas in this approach. Examination of structures of similarities in data collected provide the foundation for this and suggest an analogue would be more similar to its problem schema than other analogue since the schema contains all the features common to the two analogues and none of the differences (Tversky, 1977). Thus analogy-guided learning plays a role in increasing the difficulty of mental models and problem schema of the students and allow for future cue recognition and retrieval when faced with novel clinical situations. As the students gain more clinical experience through the use of analogy-guided learning, their clinical decision making ability is enhanced as they are able to diagnose the patients’ problems more accurately through the use of analogous reasoning. The analogues reasoning is further facilitated through guided reflection in the post clinical debriefing sessions.

The positive perception of the results of the survey showed that post clinical debriefing helped students in applying their knowledge learnt in classroom to clinical practice. This was made possible with the use of guided reflection and analogy –guided learning during the debriefing linking their previous knowledge to the clinical scenarios of the patients under their care. The findings also concurred with findings in studies by Benner et al (1996) and Tanner et al (1987) which indicated cue recognition positively influences decision making ability and accuracy. In the context of this study, students perceived that the post clinical debriefing positively influenced their development of clinical decision making. This was supported by high percentage score for Item 2 in the satisfaction survey: “The debriefing sessions provided me with a variety of learning activities to promote my learning in clinical areas”. The outcome of students’ reflection –on –action enhanced the growth of the students’ learning. Reflection was an essential component of experiential learning because it provided opportunities for students to extract principles that facilitated the transfer of learning to new situations (Donovan, 2005). Reflection allowed the students to connect classroom and clinical knowledge, to be dealt with feelings and conflicts and comprehended their strength and weakness (Langley & Brown, 2010). Emotion and emotional release are important in debriefing. Helping the students to release their emotional energy allow them the opportunity to structure their knowledge learnt to be stored in memory. In this study, consents were obtained from the group members for the confidentiality of their reflection during the debriefing session. This encouraged and made the students felt safe to express their feeling to the group knowing their expressions would be kept confidential. Emotional release can provide new direction for the students in learning from their experience. Associating guided reflection with critique and correction allows learning to occur through structured intellectual activities during debriefing (Kuiper et al., 2008). Adding the component of nursing process into the debriefing prepares the students for assimilating their knowledge, skills and values into their clinical practice. In this way it supports the accommodation and transference for future application in patient care setting Assimilation and accommodation are the final aims in a practice discipline and the core of reflection. In addition, assimilation and accommodation include expectation. Expectation and reflection are connected. While reflection is often thought of as looking back or looking at, as in reflection–on- action and reflection- in-action, (Schon, 1983; Tanner, 2006), it can also be looking forward, or reflection beyond action. This crucial aspect of reflection is considered as “seeing the future while seeing the past as a component of decision making and supports the anticipatory nature of reflection” (Klein, 1999 quoted in Dreifuerst, 2009). The capability to expect the ‘*what if’* differentiates the novice nurse from the expert and signifies advanced clinical judgment and clinical reasoning based on metacognition. (Benner, Stannard & Hooper, 1996; Tanner, 2006).

All of these defining attributes work in tandem during debriefing to create the significant learning experience. According to Posner (2009), this field experience is captured by the equation (Experience + Reflection = Growth). He adds that “we do not actually learn from experience as much as we learn from reflecting on experience” (p.19). This premise was supported by the students agreeing strongly with the item “The debriefing sessions has taught me to use reflection on my experience for learning” in the satisfaction survey. When students engaged in reflective discussion groups it promoted sharing among the students at different levels in their learning and helped the growth of the individual students. The growth could occur in the ability to anticipate the patient outcomes in clinical decision making within the clinical practice environment. When the researcher cued students to reflect on their experience, it promoted students’ reflective skills, which they applied to future novel clinical situations. Students learnt more working with faculty who were supportive and engaged with them (Manning et al., 2009). This was supported by the findings in the study. Staff who provided verbal and nonverbal encouragement and exhibited a coaching and supportive approach had a more positive impact on the students’ perceptions of their learning as demonstrated by the findings.

The factors that enhanced clinical decision making were specific for third semester nursing students who were just beginning to apply theoretical classroom based knowledge and skills in real clinical environment. The qualitative data indicated that the clinical environment provided many opportunities to engage in experiences that support the types of learning process and outcomes that positively influence their clinical decision making ability. These experiences included 1) gaining confidence in nursing skills; 2) developing relationship with clinical teacher and staff nurses; 3) connecting with patients which lead to the fourth experience :4) understanding of the clinical picture. The data collected was an indication that nursing educational programs needed to meet the needs of the students by allowing longer clinical posting in a particular ward in order for the students to develop therapeutic relationship with their clinical teacher, staff nurses and patients of the wards. Once the students are comfortable with their teacher, staff, and patients they will gain confidence in their nursing skills. This may help to enhance their understanding of the clinical picture allowing them to gain more skills in decision making. The current performance of the students in this study was an indication that the university’s program and policies were perhaps meeting the needs of the students better than those colleges and universities evidencing shorter clinical posting per ward and rapid change of clinical teachers.

The findings of this study indicated that supportive clinical environment provided many opportunities to engage in experiences that supported the types of learning processes that positively influenced their clinical decision-making ability. These experiences included (i) gaining confidence in their nursing skills; (ii) connected with the patients; (iii) building relationship with clinical teachers /staff nurses; and (iv) understanding the clinical pictures. The outcome of these experiences facilitated the students in seeing the clinical picture which was the requisite to developing clinical decision-making skills. Students gain more experience in seeing the clinical picture through observing how the clinical decision making differs between patients with similar and different problems. Prior research also indicated that connecting with patients was an important factor in students understanding the comprehensiveness of clinical decision-making (Twibell, Ryan, & Hermz, 2005; Baxer & Rideout, 2006). The findings of this study expanded the work of previous researchers in the area of educational interventions in enhancing nursing students’ clinical decision-making ability. This study revealed that the use of post clinical debriefing can enhance the diagnostic reasoning skill of students in improved “hypotheses generation”, “cue utilization” and “data collection” when presented with patients’ data. The results of quantitative and qualitative data analysis from the current study were synthesized with the five dimensions of the diagnostic process to develop a model of factors that enhance the development of nursing students’ clinical decision-making ability within the clinical practice environment. The model provides additional insights into the processes and environmental factors necessary to support students’ development of clinical decision making within the real clinical practice environment.The model indicates that optimal development of clinical decision-making ability includes the interaction of clinical environment factors and the educational strategies using information processing framework through nursing process.

**Implication**

Mixed methods study with experimental design on educational interventions needs to be conducted within the clinical setting to obtain authentic results instead of using simulations for study. This is to increase the body of useful knowledge on nursing education to meet the goal of nursing education in producing caring and competent nurses. This is to meet the demand of the employers and patient safety in health care. Post clinical debriefing as educational practices are recommended for nurse educators to facilitate learning and development of their students’ clinical decision-making ability within clinical practice environment. The recommendations are supported by the Model of Factors Enhancing Clinical Decision Making synthesized from the research findings in this study.

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