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Correlation between implementation case reflection discussion based on the Graham Gibbs Cycle and nurses' critical thinking skills☆

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Abstract
Objective: The purpose of the study is to analyze the correlation between an implementation case reflection discussion (CRD) based on the Graham Gibbs Cycle, and nurses' critical thinking skills. This research studied was evaluated CRD implementation with sample size 85 nurses and choosing used cluster sampling technique approach.
Method: The data were analyzed by paired *t*-tests. The research results showed that an implementation case reflection discussion based on the Graham Gibbs Cycle improved nurses' critical thinking skill significantly ($p = 0.001$).
Results: Demonstrate a significant increase in the nurses' ability to think critically as well as components of engagement, cognitive maturity and innovativeness after implementing CRD based on Graham Gibbs Cycle ($p < 0.05$).
Conclusion: Case reflection discussion (CRD) based on the Graham Gibbs Cycle increased nurses' critical thinking skills. This research implication thrusts the importance of ascending nurses' education levels, as *evidence-based nursing*, study material and nurses' theoretical development, monitoring, and evaluation from nursing managements.

Introduction

Prolonged nursing education is done for maintaining and developing nurses' competencies. Relevant competency development of nurses leads to higher confidence, work satisfaction, clinical nurses' retentions, and the quality nursing care.[1,2] Nurses' competencies must always be honed and developed in which one of them is the ability to think critically. Critical thinking is a cognitive process that consists of analysis, clinical logic, judgement, and decision-making capability. Critical thinking components include engagement, cognitive maturity, and innovativeness.[3,4] Nurses' dexterity in critical thinking is indispensable in providing specific nursing care. The research results suggested that the accuracy of enforced nursing diagnosis relates to nurses'

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critical thinking capability.[5,6] Critical thinking development can be applied through simulations, nursing care reflections, case study, research analyzing of practice, and role-play.[7–10] One of the events of critical thinking methods that can be performed is case reflection discussion (CRD).

CRD is a method of reflecting on nurses' critical thinking and reflecting on the base of practice. CRD as a method can deliver by Graham Gibbs reflection approach. The reflection method consists of six steps: Description, Feelings, Evaluation, Analysis, Conclusion and Action Plan.[11] According to Husebo, O'Regan, and Nestel, Graham Gibbs reflection is a straight forward reflection, comprehensible and structured by involving emotional components and nurses' way of thinking in overcoming past occurrences.[12] The reflection implementation for nurses is instrumental in critical thinking upsurge, raise courage, complement the knowledge and learning from experience.[13,14]

Hospital ''X'' is a hospital that provides health services, invariably maintains and optimizes the quality of services. Delivery of nursing care must be implemented by nursing staff who are competent to think critically. Hospital ''X'' has developed CRD but is yet to apply Graham Gibbs reflection method.

Method

The purpose of the study is to get information about the correlation between an implementation case reflection discussion (CRD) based on the Graham Gibbs Cycle and nurses' critical thinking skills.

The research had two parts of activity and used pre and post-test without a control group. The first part was training for CRD based on Graham Gibbs Cycle, and the second, we evaluated critical thinking before and after training CDR. We developed a standard procedure of CDR, tool of evaluation and conducted for role play. Moreover, we also compared the completeness of implementation CRD before and after training. The evaluation was carried out by a head nurse using an observation tool, and after CDR implementation, we evaluated nurse 'critical thinking used a questionnaire. The research used a questionnaire and a tool of observation to evaluated completeness of CRD implementation. Questioner developed by a researcher with validity >0.361 and reliability 0.9381 and observation tools developed based on Graham Gibbs Cycle. The validity and reliability are already did using expert validity and statistic Product Moment Pearson. The questioner has 3 sub-variable for engagement thinking (15 questions), thinking maturity (11 questions) and innovativeness (7 questions).

The population of this research was conducted all nurse in inpatient rooms in Hospital ''X.'' The sample size was 85 nurses chosen by sampling cluster. The sampling cluster used two levels, the first selected nurses at the ward, and then selected used purposive sampling. Based on cluster sampling, sample recruited using inclusion criteria. The inclusion criteria were a nurse at surgical and medical ward from six wards and had a position as a head team or the nurse practitioner. The analysis used a paired *t*-test to explore differences between before and after CRD implementations.

Ethical consideration

This research authorized by the Ethics Commission of Faculty of Nursing, Universitas Indonesia, No. 126/UN2.F12.D/HKP/02.04/2017. The researcher presented sufficient information about the study, consent, and rights to deny research without penalty. Approval had been received from all respondents. The researcher emphasized respondents' anonymity in this research by proving codes in the instruments.

Results

The majority of the respondents were female 64 (75.3%) whose most education background was Nursing Diploma 54 (63.5%) (Table 1). The average age of the respondents was 32.9 years of old and experiences of 8.8 years working experiences (Table 2). After 16 times, we compared the result of pre and posted CDR implementation used observation tool and for critical thinking used a questionnaire. The skill of implementing CRD based on Graham Gibbs Cycle pre-test was 64% and after implementation becomes 88.9%. There has been an increase in nursing capability implementing CRD based on Graham Gibbs Cycle 24.9% (Table 3).

The research results described the ability of nurses' critical thinking before implementing CRD based on Graham Gibbs Cycle was 108.24 (82%). Sub variable on engagement thinking was 50.07 (83.5%), cognitive maturity 36.02 (81.9%), and innovativeness 22.14 (79.1%). Whereas the total ability of nurses' critical thinking after

Table 1 Gender characteristics and nurses' education ($n = 85$).

Variable	*n*	(%)	Critical thinking		
			Mean	SD	*p* value
Gender					
Male	21	24.7%	110.29	3.85	0.342*
Female	64	75.3%	111.22	3.86	
Education level					
Nursing Diploma	54	63.5%	110.19	3.74	
Bachelor of Nursing	30	35.3%	112.20	3.60	0.012*
Master Nursing	1	1.2%	118.00	–	

*Means in $\alpha \leq 0.05$.

Table 2 Age characteristics and nurses' work duration ($n = 85$).

Variable	n	Mean	Critical thinking	
			r	p value
Age	85	32.9	0.221	0.043*
Work duration	85	1.36	0.319	0.003*

* Means in $\alpha \leq 0.05$.

Table 3 Nurses' ability implementing CRD based on Graham Gibbs Cycle ($n = 85$).

Variable	n	Mean	%	SD	CI 95%
CRD before implementation		38.38	64.0%	3.81	35.19–41.56
a. Attitude	16	17.00	75.0%	1.20	16.00–17.99
b. Skills		21.38	75.0%	3.02	18.85–23.90
CRD after implementation		53.31	88.9%	1.89	52.30–52.31
a. Attitude	16	19.19	96.9%	0.75	18.79–19.59
b. Skills		34.13	85.3%	1.54	33.30–34.95

Table 4 Nurses' critical thinking ability before and after implementation of CRD based on Graham Gibbs Cycle ($n = 85$).

Variable	n	Mean	%	Mean difference	%	SD	CI 95%	p value
Critical thinking								
Before	85	108.24	82.0%	2.75	2.1%	4.05	1.88–3.63	0.000*
After	85	110.99	84.1%					
Engagement								
Before	85	50.07	83.5%	1.29	2.1%	3.36	0.57–2.02	0.001*
After	85	51.36	85.6%					
Cognitive maturity								
Before	85	36.02	81.9%	0.58	1.3%	1.92	0.163–0.99	0.007*
After	85	36.60	83.2%					
Innovativeness								
Before	85	22.14	79.1%	0.88	3.1%	1.24	0.61–1.15	0.000*
After	85	23.02	82.2%					

* Means in $\alpha \leq 0.05$.

implementing CRD based on Graham Gibbs Cycle was 110.99 (84.1%), cognitive maturity 51.36 (85.6%), and innovativeness 36.60 (82.2%). Implementing CRD based on Graham Gibbs Cycle increased 2.1 nurses' critical thinking. The increased component in thinking critically after the intervention was 1.29% on engagement, cognitive maturity 1.3%, and innovativeness 3.1%. Analysis results demonstrate a significant increase in the nurses' ability to think critically as well as components of engagement, cognitive maturity and innovativeness after implementing CRD based on Graham Gibbs Cycle ($p < 0.05$) (Table 4).

The significantly of think critically based on gender is highest on female (84.3%), but the analysis results indicated that there is no significant correlation between gender and the ability of critical thinking ($p = 0.05$) (Table 1). The research results revealed that there is a significant correlation between age and the ability of critical thinking ($p < 0.05$), and working experiences significantly with ability to critical thinking ($p < 0.05$) (Table 2).

Discussion

Research indicated that the implementation of CRD based on Graham Gibbs Cycle increased the capability of implementing CRD. The application of CRD before deployment using Graham Gibbs reflection models is still insufficient, and after implementation of Graham Gibbs Cycle described more systematic and suitable with the standard of CDR. This result correlates with previous research that had been performed by Dalheim, Harthug, Nilsen, and Nortvedt. Previous research stated that discussion based practices were minimally, and nurses tend delivered nursing care based on experiences.[15] Nurses' high workload becomes the main factors for lacking evidence-based implications in nursing services.[16,17] The implementation of CRD after implementation based on Graham Gibbs Cycle showed that nurses were able to conduct reflection. Nurses in conducting reflections and discussions have adopted literature and related research results. Difficulty in access to literature research is one

barrier of the evidence-based application.[15–20] The nurses achieved the aptitude during CRD socializations. Nurses in obtaining evidence-based need finesse in finding research resources, furtherance from organizations to search and read professional literature.[21]

CRD is a part of continuing professional development that nursing manager should have planning for improving the competency of nurses. The manager is also obligated to provide backing for their nurses in implementing evidence-based and new skills acquired by nurses after following CRD.[22,23] The organization gives support in forms of financial assistance, replacement, time off the learn, and clinical educator.[24] Nurses' obstacles factors in implementing CRD are their hustle bustle. The result is consistent with Katsikitis et al., research that indicated that obstacles in implanting nurses' development are the nurses' work burden and the time existence.[25]

The hypothesis of CRD implementation using Graham Gibbs Cycle's mentioned that the application of CRD will improve the ability of critical thinking. The evaluated critical thinking used cognitive maturation, engagement thinking, and innovativeness. The result of the research stated that implementation CRD based on Graham Gibbs Cycle could hone essential thinking of nursing that the consequence answered the expectation of research. The results of the findings obtained data of critical improvement thinking, but the value is not significant.

The research results stated the ability of nurses' critical thinking'' before implementing CRD based on Graham Gibbs Cycle was 108.24 (82%) and after implementation was 110.99 (84.1%). The result of the research indicates there is an improvement in nurses' critical thinking capabilities. The average improvements in nurses' capability are still very few. This thing happened because of implementations of CRD within only three weeks. This thing caused the experience and knowledge that the process of CRD is still few. Experience is one of the factors that influence nurses critical thinking capabilities.[3] Research claimed by Feng, Chen, Chen, and Pai stated that the longer experience nurses would improve more critical thinking capabilities.[26]

Other factors that the cause of minimum improvement is lacking evidence-based implementation in nursing services. Nurses have not adequately applied evidence-based from the research results attained through the process of CRD. Foo et al. research indicated that nurses need the right training, senior nurses mentoring, and sufficient timing to apply the evidence-based practice.[27] Another researcher has shown that senior nurses are more confident in using evidence-based practice.[28] The further analysis stated that the implementation of CRD based on Graham Gibbs Cycle increased critical thinking capabilities significantly. The application of CRD based on Graham Gibbs Cycle facilitates nurses from learning through experience by reflection process. Asselin, stated that the reflections done by nurses increased the critical thinking capabilities and facilitated the application of new knowledge.[29] This claim refers to other researcher that discussion reflection is useful for nurses in enhancing critical thinking, open-mindedness, improving expertise and decrease risks of making the same mistake by learning from experience.[13,14] The implementation of CRD also embraces discussion process towards cases that are experienced by nurses. Discussions implementation, according to Carter and Welch, research, can increase nursing students' capabilities to think critically.[7]

The influence of implementation CRD based on Graham Gibbs Cycle can also be seen further to increase every component to think critically. Research results indicated that there was minimal ascension from nurses' average engagement capabilities was 2.1%. Based on critical thinking questionnaire analysis results towards the engagement component and nurses indirectly apply the newly possessed knowledge to overcome problems with patients. That event confirms the research results are indicating that nurses asked evidence-based less due to limited time and skills in evidence-based management.[15,20] Analysis results further show that there was a significant increase in engagement ability. Engagement relates to confidence in thinking and communicating skills.[4] Meeting produces someone to be an excellent communicator and able to elaborate thinking process that is used to make decisions and solve problems.[30] An excellent cogitative can be accepted logically if knowledge, research results support it, or experience gained. Experience in nursing care acquired during CRD becomes a factor that increases knowledge attained through the learning process.[13]

Research results indicated there was a minimal improvement from cognitive maturity component was 1.3%. Questionnaire analysis results in thinking critically about the cognitive maturity component suggested that nurses not be firm in defending their opinions if they have a different view from others. Nurses also showed the attitude that is less open to claiming that they possess excellence within themselves. That matches what is stated by Hariyati, that many nurses have low self-esteem towards the competencies maintained. Further analysis indicated that there is a significant increase from nurses' cognitive maturity before and after implementation CRD based on Graham Gibbs Cycle. According to the cognitive development theory by Jean Piaget, someone's cognitive maturity influenced by new experience and social interactions. Learning theories are the guide for an educational programme in clinical training and on the. Piaget's work often is used to describe the developmental stages of children up through the age of adolescence. Learning based on Piaget's theory is focused on exploratory learning. In this method, the nurse as learners will discover the experiences and not by the explanation of the manager. Model Piaget can merge on the CRD implementation. In the model provide learning method emphasizes on activity and experience of the nurse.[31,32] Through the CRD implementations, nurses gain new experience and help interactions with their colleagues. Nurses' cognitive maturity is closely related to the ability to make decisions. Someone with decent cognitive maturity will make decisions by considering many possible aspects before making the final call.[30] One of the nurses' decision making is in the determination of a nursing diagnosis. Research implicated that the nursing diagnosis accuracy is related to nurses' critical thinking ability.[5,6]

Research results registered a minimal increase from the average of nurses' innovativeness was 3.1%. Based on the questionnaire analysis results on critical thinking in innovativeness components showing that nurses are lacking in applying variable methods in solving patients' problems.

Nurses tend to apply their knowledge based on observation achieved from colleagues instead of implementing a new method of evidence-based.[15] The further analysis result is indicating there is a significant increase in innovation ability. Case reflection discussion facilitates the curiosity of a person to new things. Through the process of journal reading, nurses gain new knowledge that comes from research results.[10,18,33,34]

Analysis results indicated that gender is not a factor in nurses' critical thinking ability. These research results are in accordance with the research done by Salehi, Bahrami, Hosseini, and Akhondzadeh, that concluded there is no meaningful difference in critical thinking abilities between females and males.[35] Analysis results suggested that the majority of nurses possess a Diploma in nursing and it also indicated that there is significant relativity in education levels with nurses critical thinking capabilities. Nurse with Diploma got the lowest critical thinking capabilities than Bachelor and Master of Nursing. Potter and Perry mentioned that nurses' education levels relate to knowledge, the higher education of nursing create opportunities for nurses to follow science development.[36] Higher education will ascend intellectual capability, interpersonal, and technical needed for by a nurse in executing nursing care.[37] The research supports this indicated that nursing education influence critical thinking ability in providing nursing care.[38]

Analysis results suggested that there is a relationship between work duration and critical thinking skills. The resulting finding is due to the increasing age and length of the working period will add experience that will impact improve the ability to think critically. The results are by what LeFevre if the person involved, is a factor affecting the ability to think critically.[3] Research results enforce this that 95 nurses in Egypt in 2011 which contains the time and duration of work nurses are related to their ability to think critically.[39] Nurses with longer work duration will gain more experience varieties.

Conclusion

The ability of nurses to implement CRD increased after implementation CRD based on Graham Gibbs Cycle. Critical thinking evaluated by cognitive maturation, engagement thinking, and innovativeness. The nurses' ability to think critically described a significant increase in nurses' engagement thinking 2.1%, cognitive maturity 1.3% and innovativeness 3.1%. Characteristics (education, age, and work duration) related significant with nurses' critical thinking ability, whereas the correlation between gender and critical thinking are not significant.

The statistical results limited improved, but the findings obtained data of critical improvement thinking. Limited improvement happened because implementations of CRD within only three weeks and needed more time and learning continuously. Research indicated that nurses lack the right training, senior nurses mentoring, and sufficient timing to apply CRD. The organization support in forms of financial assistance, replacement, time of the learning, and clinical educator.

Hospital management can also implement case reflection discussion (CRD) based on Graham Gibbs Cycle as the effort for increasing the nurses' ability to think critically. Nursing management also needs to facilitate nurses in the implementation of CRD with the CRD training, support nursing literature, digital library and access to the internet so that the applications of CRD can be more optimal.

Conflict of interests

The authors declare no conflict of interest.

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