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Relationship between critical thinking disposition of nursing Studentsand their performance for patients on haemodialysis

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Abstract: *Critical thinking is vital to evidence-based nursing practice and is essential in the current complex health care delivery system.*
Aim*: the study aimed to assess the relationship between critical thinking disposition of nursing students and their performance in clinical area with patients on hemodialysis.*
Setting*: The study was carried out at dialysis unit in Benha University Hospital, Egypt.*
Research design: *descriptive correctional design was used.*
Sample: *convenience sample composed of 52 internship nursing studentswho studied 4 academic years in different departments.*
Tools: *Three tools were used for data collection; first, one is The California critical thinking disposition inventory scale, the second is Observational checklist for analyzing CT in dialysis unit. The third is observational checklist for haemodialysis nursing skills.*
Results: *more than half (55.8%) of students aged between (20- 22) years old. Half (50%) of them were ambivalent disposition of critical thinking with mean score 240.86±31.26. more than half (61.5%) of student were insufficient using critical thinking in caring of patient on hemodialysis and there was positive correlation between critical thinking disposition of students and total performance of CT in dialysis unit(r = +.573**).*
Conclusion: *there is positive correlation and highly significant between critical thinking disposition of students and their performance in clinical area with patient on hemodialysis.*
Recommendations: *The study recommended thatCT is needed not only in the clinical practice environment, but also required as a comprehensive component in nursing education programs for the development of students' CT skills.*
Keywords:*critical thinking deposition, nursing performance, haemodialysis, clinical nursing practice.*

I. Introduction

The practice of nursing requires critical thinking. Critical thinking is the process of intentional higher level thinking to define a client's problem, examine the evidence-based practice in caring for the client, and make choices in the delivery of care (**LeFevre, 2014).** According to **Facione (2006)** Critical Thinking is identifying problems, assessing resources and generating possible solutions and skills including the ability to analyze, synthesize, infer, and evaluate situations. In addition**, Giancarlo and Facione (2007)** asserted that critical thinking is a disciplined, self-directed cognitive process leading to high quality decisions and judgments through the analysis, assessment and reformulation of thinking.

Clinical skills in nursing are obviously important, but critical thinking is at the core of being a good nurse. Critical thinking skills are very important in the nursing field because they are what you use to prioritize and make key decisions that can save lives. So the critical thinking skills of nurses can really mean the difference between someone living or dying.

According to **Kelly , Ku & Irene, (2010)** Critical thinking allows nurses to logically assess their own experiences and training and apply it to patient care and the ability of nurses to cope with problems, direct their skills in determining patient needs and providing systematic care are all dependent upon their critical thinking skills.

All acts in nursing are deeply significant and require a mind be fully engaged in the practices based on the sound reasoning of intelligent minds committed to safe, effective client care **(Nicholson, Anita Christine 2010) .**Patient undergoing dialysis considered among critically ill, present with a variety of problems, pathologies and needs, these critically ill patients are unable to communicate their symptoms or their needs. So, Nurses today are expected to use critical thinking skills to make judgments about patient situations and act upon those judgments on a daily basis **(Profetto et al., 2003).**

The dispositional characteristics of critical thinking described in seven habits of the mind: truth seeking, open-mindedness, analyticity, systematicity, self-confidence, critical thinking inquisitiveness and

maturity, These require nursing students to display unique qualities and high levels of critical thinking to solve patients problems and achieve optimal and high quality patient care**.**Thus, the aim of this study is to assess critical thinking disposition of the nursing students and evaluate the relation between critical thinking disposition of internship nursing students and their performance in clinical area with patients on hemodialysis**.**

Significance of the study

The overall objective of the baccalaureate program is to prepare the graduate nurse for the role of a professional nurse, equipped with knowledge, skills, attitude necessary to nursing care especially in critical situation, and demonstrate an advanced ability to think critically, communicate effectively, and solve problems. So we should explore the critical thinking disposition of internship nursing students and the relation with their performance in clinical area especially dialysis unit as critical patients with more health problems need analyzing, evaluating data and good decision making.

Aim of the study:

- Assess critical thinking disposition of the nursing students
- Assess the relation between critical thinking disposition of nursing students and their performance in clinical area with patients on hemodialysis.

Research question:

-Is there relationship between student critical thinking disposition and their performance in clinical area?

II. Subject and Methods

Research design: Descriptive correctional design was utilized in this study.

Setting: Benha University Hospital where nurses intern students have their internship training, The hospital includes different clinical units mainly dialysis unit is the study setting. Dialysis unit have 20 beds. It receive about 40-60 patients daily. Dialysis units consider critical area and need professional nursing behaviour's with critical ways.

Subject: The sample of the study consists of the baccalaureate students who studied four academic years in different departments to assess their dispositions toward critical thinking. The nurse's students enrolled in the internship years atBenha University Hospital during the time of the study from first of September 2014 until the end of August 2015, their total number was 52 nurse intern students. They were all females, their age from 21-24 years old.

Tools: Data was collected through three tools

1- California critical thinking disposition inventory (CCTDI):

Thecalifornia critical thinking disposition inventory scale developed by **Facioneet al. 2001** was used to collect data concerning the disposition of undergraduate nursing studentsand their ability to think critically. It consists of two parts:

Part I: It includes the demographic data of the students as students' name, and age**.**

Part II: It consists of 75 items grouped into seven dispositional characteristics subscale namely: truth seeking which measures the disposition to evaluate alternatives or differing thoughts and it includes 12 items, open-mindedness that means being accepting of divergent views, intellectual curiosity and desire for learning and it includes 12 items, analyticity that means break down information into its parts to discover their nature, function and the relationships among these parts and it includes 11 items, systematicity means the disposition towards organized, orderly and focused process in the inquiry stage and it includes 11 items, self-confidence means trust one place in one's own reasoning processes, it includes 9 items, inquisitiveness mean know by seeking knowledge and understanding through observation and thoughtful questioning in order to explore possibilities and alternatives and it includes 10 items. Finally, maturity that means the ability to be judicious in their own decision-making and it includes 10 items. Students responded using a 6-point Likert scale ranging from strongly agree to strongly disagree.

Scoring system: the scoring of the full CCTDI scale covers a range from70 up to 420. Scores above 280 indicate a positive overall disposition towards CT. The total score between 210 and 280 indicates ambivalence towards CT and below210 indicates opposition towards CT. Sub-scale scores ranging from 30 down to 10 indicates a negative disposition. Scores between 40 and 30 indicate an ambivalent disposition towards CT. Scores on the sub-scales that are at 40 or above are considered as a positive disposition, with marks ranging from 50 to 60 indicating strong positive disposition towards CT (**Facione et al., 2001**).

2- Observational checklist for analyzing CT in dialysis unit.

Developed by **Scheffer&Rubenfeld, (2000)** it will use to evaluate students ability to apply critical thinking in caring of patients in clinical area (dialysis unit).

Scoring system:

- 0-15: deficient CT probably contributed to event.
- 16- 25: insufficient CT possibly contributed to event.
- 26-30: CT may be insufficient, but consider additional contributing factors.
- 31-34: CT was good; consider other contributing factors.

3- Observational checklist of nursing skills for patient on haemodialysis

It was used to identifying students' performance regarding skills for haemodialysis patients , which included various procedures such as venous access insertion , care of venous fistula , monitor the patients' vascular accesses , administering the necessary medications in the process , preparing machines, initiation and termination of dialysis procedure and monitor patient's complications during dialysis.

Scoring system:

The degree of this checklist is one hundred. The student degrees are identified by using average grade point scale that is designed as accumulated form for assessing students‟ progress grades in the current years.
Poor = less than 60 degrees
Average = 61-84 degrees
Good = 85- 100 degrees

Procedure

The study was conducted inBenha University Hospital where nurse's intern students have their internship training, the hospital includes different clinical units mainly dialysis unit is the study setting. Agreement was obtained from the students,The period of the study from September 2014 to August 2015, firstly, the student filled the california critical thinking disposition inventory (CCTDI); this sheet took 25-30 minutes to fill. The researchers observe the students who have training in dialysis unit by using Observational checklist for analyzing CT in an event. and identifying students' performance regarding skills for patients on haemodialysis, which included various procedures such as venous access insertion , care of venous fistula , monitor the patients' vascular accesses , administering the necessary medications in the process, preparing machines, initiation and termination of dialysis procedure and monitor patient's complications during dialysis by using observational checklist of nursing skills, Every student was observed three times per week then the researchers taken the mean of the three times.

Pilot study:

A pilot study was carried on 5 intern nurses students who have training at dialysis unit atBenha University Hospital to test the applicability and clarity of the questions, and to estimate the time needed to complete the questionnaire. Based on the pilot study analysis, corrections were done. This sample was included in the total sample of the study.

Ethical consideration;

An oral informed consent was obtained from each participant. Each participant was informed about their rights to refuse or withdraw from the study at any time. All subjects were reassured about the confidentiality of any obtained information collected and that it will used only for the purpose of scientific research with no consequence .

Statistical Design:

The data collected were tabulated and statistically analyzed using IBM SPSS advanced statistics version 20 (SPSS Inc., Chicago, IL). Numerical data were expressed as mean and standard deviation. Qualitative data were expressed as frequency and percentage. Chi-square test was used to examine the relation between qualitative variables. A p-value < 0.05 was considered significant and <0.001 was considered highly significant.

Limitations

- Findings of the current study can't be generalized because of small sample size.

III. Results

Figure (1) this figure shows distribution of student's age, it illustrated that more than half (55.8%) of subject aged between (20- 22) years old.

Table (1) this table shows the distribution of total california critical thinking disposition among intern nursing students in dialysis unit, it showed that the overall total scores indicating fifty percent of the students were ambivalent dispositions towards critical thinking, where more than half (50%, 63.5% and 65.5%) of them were ambivalent disposition in truth seeking, open-mindedness and analyticity respectively, in addition to 48.1% were also ambivalent disposition in systematically subscale while (46.2%, 38.5%) were negative disposition in inquisitives and maturity subscales respectively also more than half of students 53.8% were negative disposition in confidence.

Figure (2) this figure shows thatdistribution of nursing students regarding total performance of critical thinking in dialysis unit. It illustrates that more than half (61.5%) of student were insufficient critical thinking, while less than ten percent were good critical thinking.

Figure (3) Correlate betweentotal disposition of critical thinking and total performance of CT in dialysis unit, this figure shows that there was positive correlation (**r = + .573**)**

Table (2): this table shows relationship between students 'disposition toward critical thinking and their performance of skills for Hemodialysis patients, there was statistical significance (p=0.01)

Table (3): this table shows relationship between students 'applying of critical thinking and their performance of skills for Hemodialysis patients, there was highly statistical significance (p=0.00).

Figure (1) *Distribution of students according their age*

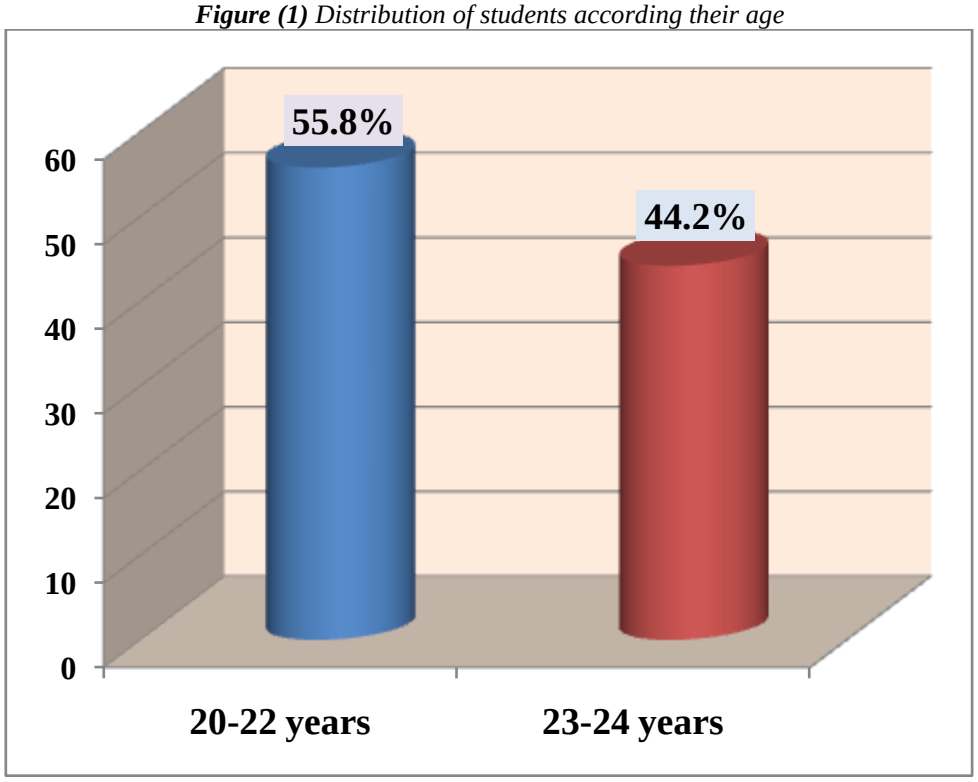


Table (1) *Distribution of total California critical thinking disposition among intern nursing students in dialysis unit*

Items	Positive disposition N. %	Ambivalent disposition N. %	Negative disposition N. %	Mean ± SD
Truth Seeking	8 15.4	26 50.0	18 34.6	33.84 ± 4.7
Open-mindedness	7 13.5	33 63.5	12 23.0	34.92± 5.68
Systematically	7 13.5	25 48.1	20 38.5	33.28± 7.51
Analyticity	4 7.7	34 65.5	14 26.9	33.59± 4.99
Inquisitives	10 19.2	18 34.6	24 46.2	31.84± 6.04
Maturity	13 25.0	19 36.5	20 38.5	32.75 ±6.65
Confidence	13 25.0	11 21.2	28 53.8	31.75 ±8.09
Total	14 26.9	26 50.0	12 23.1	240.86 ± 31.26

Figure (2) *Distribution of students regarding total performance ofcritical thinking in dialysis unit*

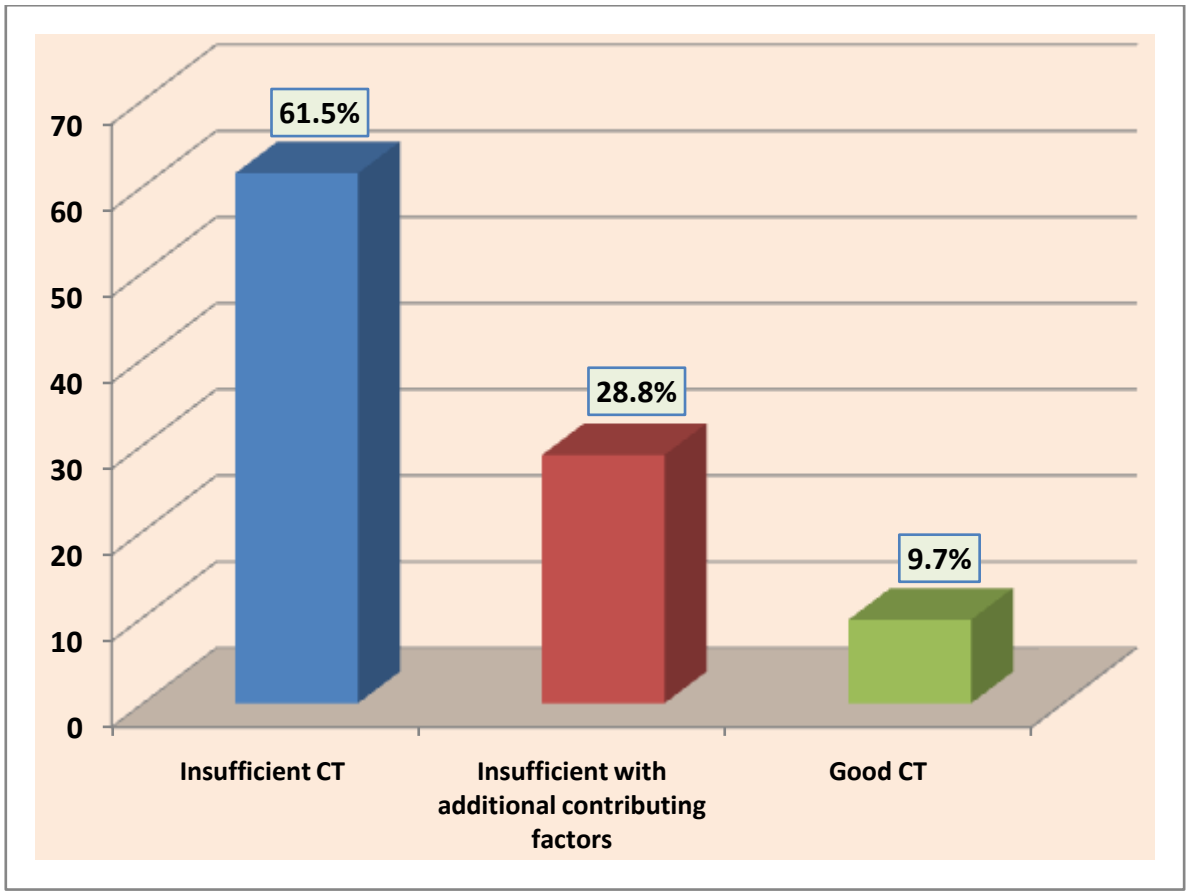
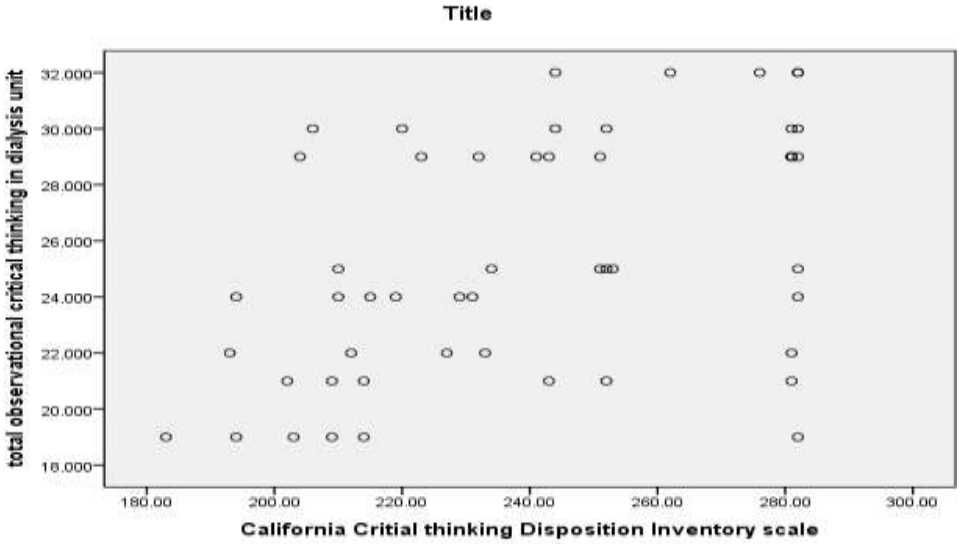


Figure (3) *Correlate between students 'disposition toward critical thinking and total performance of CT in dialysis unit*



r = + .573**

Table (2) *Relationship between students 'disposition toward critical thinking and performance of skills for Hemodialysis patients*

Total performance of skills / Disposition toward critical thinking	poor		Average		Good		X2	P value
	N.	%	N.	%	N.	%		
Negative disposition CT	6	26.1	0	0	0	0	18.856	0.01*
Ambivalent disposition CT.	15	65.2	9	64.3	5	33.2		
Positive disposition CT.	3	13.0	6	42.9	10	66.7		

Table (3) Relationship between students 'applying of critical thinking with performance of Hemodialysis skills

Total dialysis practices / Applying of critical thinking	poor		Average		Good		X2	P value
	N	%	N	%	N	%		
Insufficient CT	20	76.9	12	85.7	0	0	31.327	.000**
Insufficient CT with additional contributing factors	6	23.1	2	14.3	7	58.3		
Good CT	0	0	0	0	5	41.7		

IV. Discussion

Critical thinking is an essential component of nursing professional accountability and quality of care. **(Distler, 2007).**It is necessary to provide students with the skills to seek, analyze and utilize information effectively.Nurses who have developed the dispositions for truth-seeking, open-mindedness, analyticity, systematically, self-confidence, maturity and inquisitiveness are more likely to apply critical thinking in their profession. Therefore, ccritical thinking is vital to the nursing process, and clinical reasoning from which decisions are made and interventions taken will lead to good patient outcomes **(Hwang et al., 2010), and (Mahoney et al. 2012).**

The subject of this study were all females, more than half of them aged between (20- 22) years old, all are in internship year. The results showed that the overall total CCTDI scores indicating fifty percent of the students were ambivalent dispositions towards critical thinking. This may be due to inadequate inclusion of critical thinking in undergraduate nursing programs consistent with other studies by **Tafazzoli et al. (2015)**who studied the relationship between critical thinking dispositions and academic achievement in Iranian midwifery students. Their finding indicated that critical thinking disposition was unstable in the majority of the students. Also**Barkhordary et al. (2009) and Ip et al. (2000)** researches showed the same result.

Opposite to the present study**wangensteen, et al. (2010)**who studied critical thinking dispositions among newly graduated nurses. It showed that more than two third of the respondents reported a positive disposition towards critical thinking and **Shin et al. (2006)** assess critical thinking during the 4 th year of university found that students' critical thinking disposition was positive.This is may be due to the repeated evaluation of the students.also study of **Sulimanand Halabi(2007)** on 165 nursing students in the 1st and the 4th year of university showed that critical thinking disposition of students was positive.

Finding of the present study revealed that fifty percent of students were ambivalent on the Truth-seeking subscale which measures the disposition to evaluate alternatives or differing thoughts , this indicate that students base their practice on how procedures have always been done and they unwilling or hesitating to re-evaluate new information, This result reveal the importance of discussions and interaction between the teacher and students to develop truth-seeking.

Other study by **El–Molla, Abed and Nagib (2009)**studied the disposition of the undergraduate university nursing students toward critical thinking; they reported that nursing students had the lowest mean scores in truth seeking.Also, **Profetto-McGrath, et al. (2003)&Tiwari, et al. (2003)** reported the lowest mean scores for this subscale and opposite to the present study **Mahmoud, (2012)**who studied critical thinking dispositions of baccalaureate nursing students and relation to their achievement reported that the highest score achieved by students was on the subscale of truth seeking.

According to open-mindedness the findings of present study illustrated that 63.5% were ambivalent disposition with mean score 34.92± 5.68. This mean that the students are hesitating in accepting of divergent views, intellectual curiosity and desire for learning, this hesitation may effect on quality of nursing care. Other study by **Mahmoud, (2012)** reported that the highest score achieved by students was on open-mindedness.

Findings of the present study revealed ambivalent disposition toward analyticity and systematically that found with mean score 33.28± 7.51and 33.59±4.99 respectively. This means that students hesitating to break down information into its parts to discover their nature, function and the relationships among these parts, while in the opposite **Shin et al., (2006)** reported that Korean students tended to score high in analyticity, also **Suliman(2006)** reported analyticity, and systematicity, were predominant critical thinking dispositions. Similar results have been found by **Li, Chen and Tsai (2008)**.

Regarding inquisitiveness the present study revealed that 46.2% were negative in inquisitives, this mean that the students have not an eagerness to know by seeking knowledge and understanding through observation and thoughtful questioning in order to explore possibilities and alternatives.Therefore, findings of the present study may important for faculty members for developing of teaching strategies that improve inquisitiveness instead of the teaching that takes place in a classroom. In the same line **Mahmoud, (2012)** found critical thinking inquisitiveness subscales were achieved by students with lowest score. In contrast the **Profetto-McGrath (2003)** found the highest score students have in inquisitiveness which reflects eagerness to obtain knowledge even when it may not have immediate use. Other studies contradict our research like **wangensteen, et al**. **(2010)** who found that nearly 90% of the nurses were positively disposed on the Inquisitiveness subscale.

As regarding to maturity ; the present study showed that More than third of subject have a negative disposition in maturity, this mean that students lacked of the ability to be judicious in their own decision-making.Also findings of**KyungrimShin,et al. (2006)** who study critical thinking dispositions and skills of Senior Nursing Students in Associate, Baccalaureate, and RN-to-BSN Programs, their result showed the lowest score in maturity.

Again finding of present study revealed self- confidence subscale was more than half of students were negative disposition , this mean that they lack the assurance of their reasoning abilities. The results supported with **Mahmoud, (2012)** and **Ferol, et al. (2010)** who reported that self- confidence was achieved by students with lowest score. Also the findings of **El-Molla, et al., (2009)** revealed thatnursing students of the four academic years are less – confident in themselves.

According to **Oermann, (2000**)the ability of graduates from nursing programs to think critically in the clinical setting is an important role of a registered nurse.The result of this study showed that more than half of nursing students were insufficient using critical thinking in caring of patient on hemodialysis and only less than ten percent had good critical thinking. Indicating a fundamental limitation of nurse's potential to develop expert knowledge and clinical practice ability.Other studies of nursing graduate preparation by **Del Bueno (2005)and Flores et,al (2012)** found that less than half of nursing graduates think critically.

Nurses need to continuously develop the critical thinking skills because the clinical situations that nurses interpret are complex and diverse, making achievement of accuracy of nurses' diagnoses a challenging task. **Lunney M. (2003).** The relationship betweenCriticalthinking disposition and performanceshowed that there is positive correlation and highly significant between critical thinking disposition of students and their performance in clinical area with patient on hemodialysis, $r = .573$ and $p = \leq 0.01$.Therefore, it is important to include critical-thinking skills components in education programs to prepare the graduated students to succeed in the workplace,in the same line varies studies such as **Chong, et al. (2008),Aari, et al. (2008),Rotherham and Willingham (2010)**, **Facione , (2011), Applin, et al. (2011), and Behar-Horenstein (2011),** reported that critical thinking components included in nursing education has the positive influence on the development of critical-thinking skills.

According to relationship between student ' applying of critical thinking and student 'performance of hemodialysis skills, there was highly statistical significant, in the same line**Pilevarzadeh and Mashayekhi(2015)** and**Ghazivakili, (2014**) found that the total score of critical thinking and analytical skills of

students and their performance had a significant relationship. In addition,**Nasrabadi, et al., (2012)** study showed that there was a positive relationship between critical thinking reflection attitude and academic achievement.

V. Conclusion

The results showed that the overall total CCTDI scores indicating fifty percent of the students were ambivalent dispositions towards critical thinking. Theywere ambivalent in the dispositional characteristics of the Truth-seeking, open-mindedness, analyticity and systematically while they were negative in inquisitives, maturity and self- confidence**.**More than half of them were insufficient using critical thinking in caring of patient on hemodialysis.Moreoverthere is positive correlation and highly significant between critical thinking disposition of students and their performance in clinical area with patient on hemodialysis

VI. Recommendations

Nursing educators should encourage critical thinking among nursing students. CT is needed not only in the clinical practice environment, but also required as a comprehensive component in nursing education programs for the development of students' critical thinking skills.

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