

Critical Thinking Dispositions among Students at Faculty of Nursing in Suez Canal University

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Abstract: Background: The need of critical thinking dispositions are increased in nursing profession. It could be helpful to motivate nurses and encourage them to think critically. It may be contributing to enable them to analyze, solve surrounding problems and provide safe and competent patient care. **Aim of the study:** It aimed to compare critical thinking dispositions among students at Faculty of Nursing in Suez Canal University. **Subjects and methods:** Comparative descriptive design was conducted on 251 nursing students from four academic years by using stratified random sample. Data were collected using California Critical Thinking Dispositions Inventory to assess critical thinking dispositions among nursing students. **Results:** Total critical thinking dispositions and its characteristics of truth seeking, open mindedness, self-confidence and inquisitiveness had higher mean scores among third year students than others, with statistically significant differences. **Conclusion:** Critical thinking disposition has statistically significant differences among four academic years' nursing students. **Recommendations:** Conducting training programs, targeting critical thinking dispositions and various teaching strategies contributing to improve it for students and tutors, are needed to be implemented.

Key words: Critical thinking dispositions, Nursing students, Nursing education.

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I. Introduction

Health care environment requires professional nurses with critical thinking ability qualifying them to deal with surrounding problems. Critical thinking is considered one of the prominent proficient attributes of graduate nurses helping them to make efficient judgment in the present fast altering clinical situations (Kong et al., 2014; Cui et al., 2018). It is considered an essential segment of proficient accountability (Hutchison, 2013). The concept of critical thinking differs among disciplines (Senita, 2017). In health care field, it is viewed as the capability to analyze, observe, order and evaluate facts to practice decisive clinical judgment related to patient care (Pieterse et al., 2016). It allows nursing students to think in an organized systematic manner and supports them in conversion to clinical practice (Riede, 2015; Mahmoud & Mohamed, 2017). So, higher education institutions are responsible for developing critical thinking dispositions of nursing students across learning programs to produce graduates who are capable of making important clinical decisions (Kim et al., 2014; Kaddoura et al., 2017).

Critical thinking involves two elements: critical thinking dispositions in addition to skills (Davies & Barnett, 2015). Critical thinker should have the disposition and tendency to utilize critical thinking ability resulting in rational and logical action (Davies & Barnett, 2015; Trimpe, 2015; Von Colln-Applying & Giuliano, 2017). Critical thinking dispositions are affective element of critical thinking. It is recognized as the willingness and motivation to think in a rational and logic manner. Also, it is the attitude to discover numerous perspectives, and the tendency to make judicious decision (Davies & Barnett, 2015; Darby & Rashid, 2017; Lee, 2018). Individuals who have positive dispositions toward critical thinking are more prepared to utilize their critical thinking skills because propensity and willingness to think critically play an essential role to exercise and develop critical thinking ability (Ojewole, 2013; Dwyer et al., 2017; Foster, 2017; Shakurnia & Baniasad, 2018).

Critical Thinking dispositions involve seven traits: truth seeking which means having inclination to seek the best knowledge in a given situation, open- mindedness refers to the tendency to respect the different views of others and consider innovative ideas, systematicity is the predisposition to deal with facts and problems in an ordered manner, cognitive maturity is the tendency to be judicious when making decision and the alertness of the difficulty of the problem, critical thinking self-confidence means having trust in ability of person to reason, inquisitiveness refers to having desire to acquire new information and analyticity which means the

ability to be alert, analyze surrounding problems and consider potential consequences of choices and situations(Ojewole, 2013;Derrick-Telemaque, 2014;Facione, 2015).

There are many factors contributing to critical thinking in nursing education(Chan, 2013).Some of these factors could positively influence on critical thinking such as: constructive learning environment (Sasson et al., 2018),positive educators' behaviors and predisposition toward critical thinking(Raymond et al., 2018),effective application of educational strategies, and students' cultural background that encourage generating and analyzing ideas(Chan, 2013).Whereas, there are other factors that could negatively influence on critical thinking such as: lack of critical thinking self-confidence (Zuriguel Perez et al., 2015),lack ofdevelopmental programs for educators about application of critical thinking (Grieco, 2016),traditional educational approaches, time restrains, inadequate clinical supervision and modeling (Alinaghizadeh et al., 2012; Van Graan et al., 2016).

Significance of the study

Critical thinking competence is an outcome of excellence of undergraduate nursing programs (Wangenstein et al., 2010; NLN, 2013). It can directly affect patient care and safety (Kaddoura & Dyke, 2017). To have qualified and experienced nurses, nursing educators should be sure that students are acquired preparedness toward utilization of their critical thinking abilities to examine surrounding situations, resolve problems and make judicious decisions related to competent patient care (Marchigiano et al., 2011).

Assessment of critical thinking dispositions among students can guide tutors and teaching staff to develop educational strategies with targeted learning activities that improve critical thinking abilities of students (Živkovic, 2016).Also, adoption of Problem-based learning strategy can inspire nursing students to analyze ideas, observe situations and spontaneously develop critical thinking dispositions of students (Gholami et al., 2016). Hence, it was necessary to assess critical thinking dispositions among students at faculty of nursing in Suez Canal University that adopts PBL as a main educational approach.

II. Aim of the Study

The aim of the present study was to compare critical thinking dispositions among students at Faculty of Nursing in Suez Canal University.

Research Question:

- Are there significant differences in critical thinking dispositions of students among four academic years at Faculty of Nursing?

III. Subject and Methods

Research design: Comparative descriptive design was utilized in the current study.

Research Setting: This study was conducted at Faculty of Nursing in Suez Canal University.

Subject:

Sample included students from four academic years at Faculty of Nursing (N= 723 nursing students) as the following: year1= (163 student), year 2= (185student), year 3= (184 student) and year 4= (191 student). Of these 723 students, 251students from four academic years are included in the study, distributed proportionally as the following: (Year 1 (23%) = 58 student, Year 2(26%) = 65 student, Year 3 (25%) = 63 student and Year 4 (26%) = 65 student). Sample size was calculated according to the following equation (Wassertheil- Smoller, 2004):

$$n = \frac{((Z * \sigma)^2 / (e)^2)}{1 + ((1/N) * ((Z * \sigma)^2 / (e)^2)}$$

Where:

N = target population = 723

Z = Confidence level, at 95% = 1.960

σ = Standard deviation of the population = 4.0

e = the maximum acceptable error as fraction of the standard deviation = 10% of SD = 0.4

Sample Size (n) = ((1, 96 X 4) 2 / (0, 4) 2) / 1+ ((1/723) X ((1, 96 X 4) 2 / (0, 4) 2)

Sample size = 251 students

Sampling Technique:

Stratified proportional random sample was used to select students from each academic year.

Tool of data collection:

California Critical Thinking Dispositions Questionnaire that consists of two parts:

❖ **Part I:**

Include demographic data of the students e.g.: student's name (optional), academic year, age, gender and work during study.

❖ **Part II:**

California Critical Thinking Disposition Inventory (CCTDI) that was developed by **Facione and Facione (1992)**, to assess nursing students' dispositions (willingness) to think critically. It consisted of 75 items grouped into seven dispositional characteristics namely: Truth seeking (12 items), open-mindedness (12 items), analyticity (11 items), systematicity (11 items), self-confidence (9 items), inquisitiveness (10 items) and maturity (10 items). All items of the seven disposition characteristics were scrambled. CCTDI had been translated into Arabic and validated by **Agwa and Elbana (2000)**.

Scoring System:

The nursing students responded to this inventory along a continuum of 6- point likert scale ranging from 1="strongly disagree" to 6="strongly agree". Score for the positive items indicate that:-

1 = strongly disagree 2 = disagree 3 = slightly disagree

4 = slightly agree 5 = agree 6 = strongly agree

For the negative items the score is reversed.

The total CCTDI score ranges from 70 to 420. Overall scores from 280 to 420 indicated a positive dispositional level. Overall scores from 210 to 279 indicated ambivalence toward disposition and scores of below 210 indicated a negative disposition regarding critical thinking.

Validity and reliability of CCTDI:

The tool has construct validity for original and Arabic version. Cronbach's alpha of the overall instrument is 0.91 and for seven subscales ranged between 0.71 – 0.80 for the original tool (**Facione & Facione, 1992**). It had been translated into Arabic by **Agwa and Elbana (2000)** with cronbach's alpha score ranged between 0.77-0.86.

Procedure:

An official permission was obtained from the dean of faculty of nursing in Suez Canal University for collecting data from students. Informed written consent was obtained from students in each academic year who have agreed to participate in the study after explaining the aim and nature of the study. The data were collected during the second semester of the academic year 2017-2018 during February, March and April. CCTDI was used to measure critical thinking dispositions of nursing students. It was collected from students using structured interview. CCTDI was collected before and after students were approached at break time (After lectures, skill labs, in the hours of student activities), in a suitable pre-arranged class. It took 15-20 minutes to be completed

Pilot Study:

A pilot study was carried out on (10%) of the study participants who was excluded from the study sample to check the applicability and feasibility of instruments and identify the obstacles and problems that may be encountered. The pilot study was conducted on 25 students taken proportionally as the following: year 1 (5 students), year 2 (7 students), year 3 (6 students) and year 4 (7 students).

Ethical consideration:

Primary approval was obtained from the research ethical committee in the Faculty of Nursing, Suez Canal University. Students were informed that they have the right to refuse to participate in the study or withdraw from it at any time with no negative consequences. Also, the confidentiality of the data will be maintained and the results will be only used for the research purpose.

Statistical analysis:

Data were organized, revised, tabulated and statistical analysis was done by computer using statistical package of social science (SPSS) program, version 20. Data were tested for normality of distribution prior to any calculations. All continuous data were normally distributed and were expressed in mean \pm standard deviation. Categorical data were expressed in number and percentage. The comparisons among the four academic years were determined using one-way ANOVA test. Chi-square test was used for qualitative data for comparison of variables with categorical data among the academic years. Statistical significance was set at $p < 0.05$.

IV. Results

Table (1): indicates distribution of demographic characteristics among four academic years' nursing students. It was found that female students of second academic year had the highest percentage (67.7%) rather than others, with age ranged between 18 and 24 years for all students. Regarding to students' work during study, senior students of fourth year followed by third academic year (38.5%, 17.5% respectively) were working.

Table (2): shows critical thinking dispositions among four academic years' nursing students. It was found that truth seeking, open mindedness, self- confidence, inquisitiveness had mean score among third year students ($x=34.3$, $x=40.7$, $x=48.4$ and $x=47.6$ respectively) higher than others, with statistically significant differences ($p=0.044$, $p<0.001$, $p=0.026$ and $p=0.010$ respectively). Also, it was found that total critical thinking dispositions had mean score among third year students ($x=290.5$) higher than others, with statistically significant differences ($p=0.002$).

Table (3): shows levels of total critical thinking disposition among four academic years' nursing students. It was found that the highest percentage of nursing students among the four academic years had positive dispositional level toward total critical thinking disposition (41.4, 58.5%, 65.1% and 53.8% respectively), without statistically significant difference.

Table 1: Distribution of demographic characteristics among four academic years' nursing students (n=251)

Characteristics	Academic years								Test	P
	Year 1 (n=58)		Year 2 (n=65)		Year 3 (n=63)		Year 4 (n=65)			
• Gender	N	%	N	%	N	%	N	%	X ² =4.164	0.244
	Male	29	50.0	21	32.3	24	38.1	27		
Female	29	50.0	44	67.7	39	61.9	38	58.5		
• Age	18 – 20		18 – 22		20 – 23		21 – 24			
Range	18 – 20		18 – 22		20 – 23		21 – 24			
Mean ±SD	18.6 ±0.6		19.9 ±0.8		21.2 ±0.8		22.1 ±0.8		X ² =34.463	<0.001*
• Work during study	N	%	N	%	N	%	N	%		
	No	55	94.8	62	95.4	52	82.5	40		
Yes	3	5.2	3	4.6	11	17.5	25	38.5		

Table 2: Critical thinking dispositions among four academic years' nursing students

Critical thinking Dispositions	Academic years					ANOVA test	
	Year 1 (n=58)	Year 2 (n=65)	Year 3 (n=63)	Year 4 (n=65)	Total (n=251)	F	P
Characteristics	Mean ±SD	Mean ±SD	Mean ±SD	Mean ±SD	Mean ±SD		
Truth seeking	31.0 ±5.8	34.1 ±7.5	34.3 ±7.0	32.8 ±7.6	33.1 ±7.1	2.747	0.044*
Open mindedness	37.5 ±4.9	40.2 ±5.3	40.7 ±4.5	40.2 ±4.6	39.7 ±4.9	5.376	<0.001*
Analyticity	43.3 ±4.2	44.2 ±4.7	44.6 ±4.7	44.1 ±3.7	44.1 ±4.4	1.010	0.389
Systematicity	37.3 ±4.8	37.1 ±7.0	38.9 ±5.4	37.6 ±6.2	37.7 ±5.9	1.259	0.289
Self confidence	45.4 ±5.6	46.3 ±6.0	48.4 ±5.4	47.4 ±5.9	46.9 ±5.8	3.138	0.026*
Inquisitiveness	44.2 ±5.5	46.4 ±7.2	47.6 ±5.6	46.9 ±4.8	46.3 ±5.9	3.869	0.010*
Maturity	34.4 ±6.8	35.6 ±5.9	36.0 ±6.1	35.6 ±5.9	35.4 ±6.2	0.787	0.502
Total Score	272.9 ±22.0	283.9 ±7.9	290.5 ±25.8	284.7 ±23.9	283.2 ±25.7	5.075	0.002*

Table 3: Levels of total critical thinking dispositions among four academic years' nursing students

Total critical thinking Dispositions	Academic years										Chi square test	
	Year1 (n=58)		Year2 (n=65)		Year3 (n=63)		Year4 (n=65)		Total (n=251)		X ²	P
	N	%	N	%	N	%	N	%	N	%		
Negative	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	7.283	0.063
Ambivalent	34	58.6	27	41.5	22	34.9	30	46.2	113	45.0		
Positive	24	41.4	38	58.5	41	65.1	35	53.8	138	55.0		

V. Discussion

The current study showed that female students of second academic year had the highest percentage in comparison to the others. This may be due to that the educational policy of nursing faculties in Egypt permits students from technical institutes to join faculty of nursing in the second academic year. In addition, the present study result is in agreement with **Hunter et al. (2014)**, but it is in contrast with **Song et al. (2014)** who found that female students of third academic year had the highest percentage rather than others.

In addition, the study revealed that less than two fifth of senior students at fourth academic year followed by less than one fifth of students at third academic year were working in nursing field. This result may be due to that students at third and fourth academic year had been prepared for basic clinical skills during first and second academic year whether in lab or in the real situations at hospitals. This result disagrees with **Hunter et al. (2014)** who reported that employed students were from first and second academic years and represented less than one quarter of nursing students.

Regarding critical thinking dispositions and its characteristics, it was found that total critical thinking dispositions and its characteristics of truth seeking, open mindedness, self-confidence and inquisitiveness had mean score among third year students higher than others, with statistically significant differences. This result is congruent with **Kim et al. (2014)**, who found that third year students had mean score higher than others, with statistically significant difference. Whereas, it is in disagreement with **Kaya et al. (2018)**, who reported that fourth year students had mean score higher than others, with statistically significant difference toward total critical thinking dispositions, truth seeking, open mindedness, self-confidence and there was no statistically significant difference toward inquisitiveness. The present study result may be as a result of learning and clinical experiences that third year students acquired across academic years rather than first and second year. In this regard, **Kaya et al. (2018)** and **Raymond et al. (2018)** considered clinical experience a basic factor affecting positively critical thinking dispositions of students. Also, this may be as a result of third year students is mainly concerned with pediatric and obstetric topics. Hence, this could increase disposition of students to think critically and know more information about these new areas. In this regard, **Cheng and Wan (2017)**, **Shakurnia and Baniasad (2018)** stated that the content being taught could affect positively critical thinking dispositions of students.

In addition, the present study result could refer to adoption of problem based learning as a main educational approach at faculty of nursing in Suez Canal University may be contributing factor that increase critical thinking disposition among third year students than first and second years. In this regard, **Gholami et al., 2016** and **Ar-yuwat et al., 2019** stated that problem based learning could be factor affecting positively critical thinking dispositions. Besides, it was expected that senior students at third and fourth academic years had mean score higher than first and second. However, fourth year students scored lower mean score than third year students. This may be due to that fourth year students being overwhelmed with three nursing courses (community, geriatric, family) and their learning activities. Hence, they could suffer from academic pressure. In this regard, **barkhordary (2012)** and **Lee (2018)** reported that academic pressure and overwhelmed learning environment could be factors affecting negatively critical thinking dispositions of students.

It was noticed that there was no statistically significant difference among four academic years toward analyticity and systematicity dispositional characteristics. The present result is congruent with **Shin et al. (2006)** and **Wafik (2014)**. Whereas, **Kaya et al. (2018)** reported that there was statistically significant difference among four academic years' nursing students toward analyticity and systematicity. The result of present study means that there was no considerable change in analyticity and systematicity across four academic years. This may be due to the inconsistent use of suitable instructional strategies as unfolding case study, simulation and role play that teach students to be alert to situations, consider consequences of situations, value usage of evidence for resolving problem, and order their thoughts, ideas in a clear accurate manner. Also, nursing students may be dissatisfied with writing nursing care plan because they could consume longer time and effort. In this regard, **Heidari and Hamooleh (2016)** denoted that dissatisfaction of nursing students with writing nursing care plan, application of nursing process could be factor negatively affecting systematicity disposition development.

There was no statistically significant difference among four academic years toward maturity dispositional characteristics. This result is in agreement with **Profetto- McGrath (2003)** and **Noone and Seery (2018)**. Whereas, it is inconsistent with the finding of **Wafik (2014)** and **Shakurnia and Baniasad (2018)** who reported that there was significant difference among students toward cognitive maturity disposition. The result of present study may be due to that students in transitional developmental stage from late adolescence to early adulthood and this stage marked by liability of opinions, desires, interests, thoughts and beliefs. In this regard, **Furstenberg Jr (2013)**, **Arnett et al. (2014)**, **Ragab (2016)** and **Tanner and Arnett (2016)** argued that the

developmental age from 18 to 24 years is considered the passage to adulthood stage that characterized by liability in thoughts, opinions and students still shaping their cognitive maturity. Also, this may be due to that cognitive maturity come from direct contact with external environment and recurrent experience that the students have not acquired it completely (**Profetto-McGrath, 2003**).

Concerning levels of total critical thinking dispositions among four academic years nursing students, it was found that the highest percentage of nursing students had positive dispositional level toward total critical thinking dispositions. This finding is in agreement with **Wangenstein et al. 2010** and **Zarabian et al. 2016**. Whereas, **El Kasas (2012)** and **Pai and Eng (2013)** reported that the highest percentage among nursing students had ambivalent dispositional level toward total critical thinking dispositions. The present study result may be due to effect of problem based learning that is adopted as educational strategy at faculty of nursing stimulates disposition among students to think critically and solve problems through group discussion (**Hamdanetal., 2014; Gholami et al., 2016**).

VI. Conclusion

Based on the findings of this study, there are statistically significant differences among four academic years' nursing students toward total critical thinking dispositions and its dispositional characteristics of truth seeking, open mindedness, self-confidence and inquisitiveness. The highest percentage of nursing students had positive dispositional level toward total critical thinking dispositions as a result of adoption of problem based learning as a main educational approach at faculty of nursing in Suez Canal University.

VII. Recommendations

Organizing regular training programs on critical thinking as a whole, specifically disposition and importance of its using for learning and nursing practice are needed. This is in addition to conducting training programs for class tutors and teaching staff concerning various teaching strategies that contributing to improve critical thinking and its disposition among their students such as case study, role play and concept map.

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