



A Study to Assess the Critical Thinking Level of Undergraduate Nursing Students in a Selected Nursing College in Coimbatore District, India

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Abstract

Critical thinking is an essential skill that nurses need to make sound clinical decisions. It is a challenge for nurse educators to prepare the Nursing students to think critically and act skillfully. To assess the critical thinking level of Nursing students. By using descriptive survey design all 89 II year B.Sc.Nursing students were selected with sample free technique. Critical thinking ability of the students was assessed with the standardized Cornell Critical Thinking Test Level Z. Most of the students were females and in the age group of 18 and 19 years. Majority of the students (74.15%) had critical thinking score in the range of 11-20. Mean critical thinking score was found to be 17.06 ± 3.49 with the maximum score of 52. There was no association between their base line variables and critical thinking score. The critical thinking score was found to be low and there is a need to adopt teaching strategies to promote the critical thinking ability of Nursing students.

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Introduction

Health care system in India is developing rapidly and undergoes changes due to advances in medical technology, increased vulnerability of the population, health problems encountered by the individuals etc. This changing trend poses enormous burden on the nurses and also require more sophisticated high levels of thinking to deal with patient care (Jones, 2008).

Critical thinking is an intellectually disciplined process of actively and skillfully conceptualizing, applying, analyzing, synthesizing and evaluating information gathered from, or generated by, observation, experience, reflection, reasoning or communication as a guide to belief and action (Dehkordi and Heydarnejad, 2008).

This is an essential element of problem solving. Critical thinking focuses on three important aspects: identify the relationships between pieces of information, determine the relevance and validity of information and evaluating solutions for treating problems.

Critical thinking is a self-directed, self-disciplined, self-monitored, and self-corrective thinking. It is the disciplined art of ensuring that the individual use the best thinking capable of in any set of circumstances. When critical thinking takes place, it is realized in every domain of human thought, it is also possible and important to question the parts of thinking, and the standards for thought. Occurrence of critical thinking may vary from the intellectually simple to the intellectually complex people. It occurs during any sort

of activity ranging from simple reading, writing, speaking, listening, observing, to the actual brain storming task of performing. They involve one or more elements, standards of thought and also traits of mind (Richard Paul & Linda Elder, 2007).

In nursing, critical thinking is the ability to think in a systematic and logical manner with openness to question and reflect on the reasoning process which is used to ensure safe nursing practice and quality care. Critical thinking ability of the nurses will promote intellectual standards, proficient in using reasoning, commitment to develop and maintain intellectual traits of the mind and habits of thought. Ultimately nurses would be competent to use thinking skills which will develop the abilities for sound clinical judgments and safe decision making in practice (University College of the Cariboo).

A descriptive comparative study was conducted among 172 Nursing students and clinical nurses. Findings revealed that 98.3% of clinical nurses, 94% of last term students and 93% of first term students were weak in critical thinking abilities. There were significant differences between nursing students and clinical nurses in average scores of inference ($p < 0.0001$), interpretation ($p = 0.026$), evaluation of arguments ($p < 0.01$), and in total scores of critical thinking abilities but not in the areas of diagnosis of assumption and deduction abilities (Akbar *et al.*, 2004).

The traditional nursing education is more subject-based and goes in vertical direction not in horizontal connection among subjects. Nursing students really find it difficult to put knowledge together and further to apply knowledge in solving problems in the clinical area. Current educational methodology lacks the required elements of critical thinking, problem solving, reflective and decision making skills to provide competent nursing care (Jones, 2008).

Aim: To evaluate the critical thinking ability of second year undergraduate Nursing students.

Materials & Methods

Descriptive study design was used in the study. With the sample free technique all 89 students who are studying in the second year B.Sc. Nursing programme from a selected Nursing college in Coimbatore district were selected. Tool consisted of two sections. Sec I: Baseline data of the students Sec II: Critical thinking level of the students was assessed using a standardized Cornell

critical thinking test: level Z. It is a standardized test consists of 52 multiple choice items to measure the critical thinking level of students. The aspects of scale includes Deduction (items 1-10), Meaning and Fallacies (11-21), Observation and credibility of sources(22-25), Induction(Hypothesis testing)(26-38), Induction(Planning experiments) (39-42), Definition and Assumption Identification(47-52). Standardized tool was purchased. Internal consistency of the tool was calculated using KR-18 ($r = 0.76$), hence tool is found to be reliable. Test was administered for the duration of one hour. Ethical clearance was obtained from Institutional Human Ethics Committee and informed consent was taken from the study participants. Data was collected through self administered questionnaire technique.

Results and Discussion

Critical thinking level of Nursing Students

Critical thinking level of students was identified in various aspects using the standardized tool. Majority of the Nursing students (74.15%) had critical thinking score in the range of 11-20. Only 20.22% were in the range of 21-30. None of them found to have above 30 and the maximum score is 52 (Figure1).

Critical thinking score was assessed in seven aspects and the total score gained by summing up all the individual aspect is the critical thinking score of the students. Maximum score was in the area of Induction, Hypothesis testing ($4.43/13 \pm 2.0$) followed by Deduction ($4.10/10 \pm 1.37$). Minimum score was found in the aspect of Credibility (1.18 ± 0.8). However total critical thinking score was also found to be low ($17.06/52 \pm 3.49$) (Table1).

Distribution of students according to their baseline data and critical thinking score

Equal no. of students (48.31%) were in the age group of 18 years and 19 years and their critical thinking score of most of the students were between 11 and 20. Majority of them (91.01%) were females. Almost similar percentage of students (English medium: 51.68%, Tamil Medium: 48.31%) were found in each medium of instruction in their higher secondary education. Most of the students father (42.69%) and Mother (40.44%) had secondary education followed by primary education. Around 15% of both the parents had graduate and post graduate education. As far as occupation is concerned 30.33% were coolie workers and 24.71% were working in private concern. Majority of mothers (66.29%) were

house wives. With regard to area of the student's family residence 43.82%, 31.46%, 24.71% comes from rural, urban and semi urban areas respectively. Chi-square test was used to find out the association between base line data and critical thinking score of the Nursing students. Critical thinking score was independent of all the base line variables such as age, gender, medium of instruction in their previous education, Educational status of father and mother, Occupational status of father and mother, Area of family residence (Table 2). As majority of the students critical thinking score was in the range of 11-20, there was no association found between base line variables and critical thinking score. Karl Pearson correlation co-efficient was used to find out the correlation between knowledge and critical thinking score of students. Calculated 'r' value was 0.04, hence there is no correlation between the knowledge score and critical thinking score of the students.

In the present study majority of the Nursing students (74.15%) had critical thinking score in the range of 11-20. None of them found to have critical thinking score of above 30 and the maximum score is 52. Majority of the students (91.01%) were female as Nursing is female dominated profession. There was no association between the critical thinking score and base line variables. There was no correlation between the knowledge and critical thinking score (r=0.04).

Similar results are noted in a descriptive comparative study conducted by Akbar *et al.*, 2004 where 98.3% of clinical nurses, 94% of last term students and 93% of first term students were weak in critical thinking abilities. Noohi *et al.*, (2012) also reported in a survey to assess the critical thinking (CT) and clinical decision making (CDM) among nursing students of Kerman University that students yielded a low score (mean =

5/40 from 20) of CT and a mild score (mean = 12.8 from 20) of CDM. Nirmala & Shakunthala (2011) proved that Concept Mapping is effective in Development of Critical thinking (CT) Skills among B. Sc Nursing Students. Mean and SD of pretest scores of critical thinking skills of experimental and control group as 7.25, 7.9 and 2.8, 2.9 respectively. The study concluded that critical thinking scores were poor due to the high standard of the assessment tool.

Ismail AF *et.al*(2015) compared the critical thinking scores of freshmen and senior students and found that both the groups (11.79 ± 4.80 and 11.21 ± 3.17) had a low critical thinking score and there was no significant correlation found between the students CTS and their age, gender, high school grade, rank in entrance examination and interest in Nursing Profession.

Numerous research studies proved the effectiveness of innovative small group teaching methods in improving critical thinking abilities of Nursing students. A quasi experimental study by Wheeler *et al.*, 2003 used concept mapping as a teaching strategy and found that the mean critical thinking score improved significantly (6.93 to 18.2). Nielsen (2009) has used concept papers to develop student's critical thinking and clinical judgment. Jones (2008) used PBL to assess critical thinking skill development in nursing students utilizing Bloom's Taxonomy of cognitive domains. The intervention group showed increases in cognitive ability, which has been associated with gains in critical thinking skills, as well as critical thinking skills, $p < 0.000$. Similar results of improvement in critical thinking scores using PBL method was found in the studies conducted by Tiwari *et al.*, (2006), Yuan *et al.*, (2008), Dehkordi and Heydarnejad (2008).

Table.1 Critical thinking score of the Nursing students in various aspects

Sl.No	Aspects	Mean±SD	Max.Score
1	Deduction	4.10±1.37	10
2	Meaning & Fallacies	3.03±1.55	11
3	Observation & Credibility of sources	1.18±0.8	4
4	Induction(Hypothesis testing)	4.43±2.0	13
5	Induction(Planning experiments)	1.16±0.92	4
6	Definition	1.23±1.09	4
7	Assumption Identification	2.06±1.20	6
8	Total Score	17.06±3.49	52

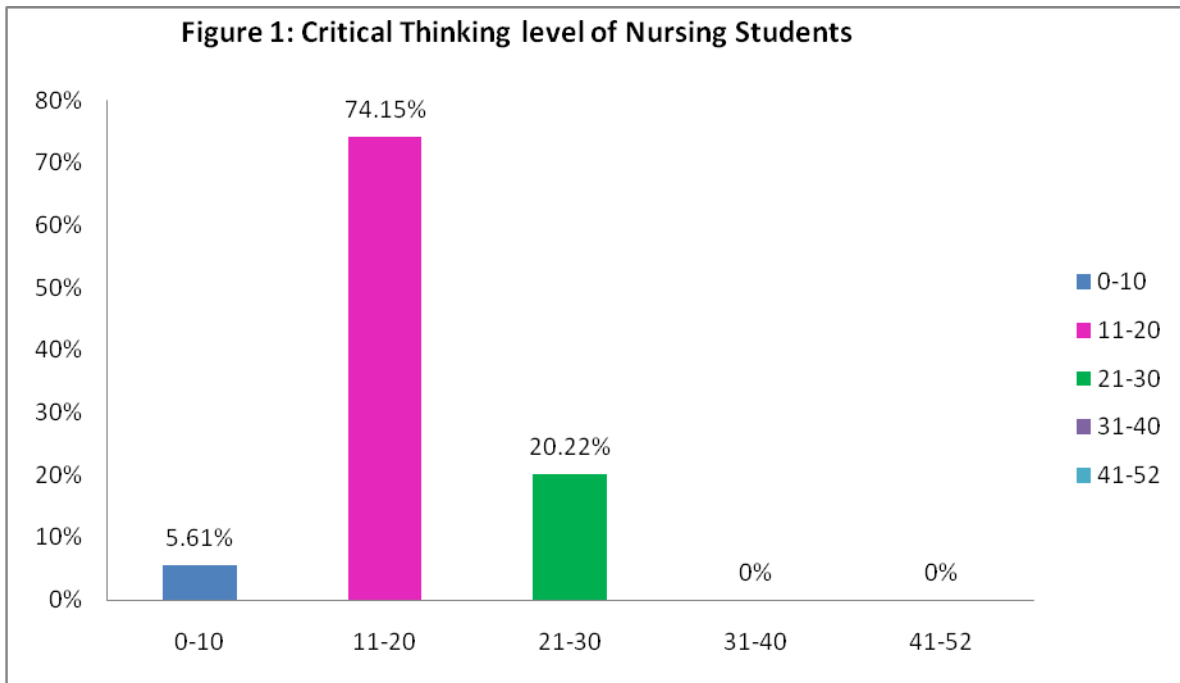
Table.2 Distribution of students according to their Baseline data and critical thinking score

N=89

S.No	Baseline Data	Critical Thinking score			Total no. of students		χ^2
		0-10	11-20	21-30	Frequency	%	
1.	Age in years						
	a. 18 years	3	29	11	43	48.31	4.3* (df=4)
	b. 19 years	2	34	7	43	48.31	
	c. 20 years	0	3	0	3	3.37	
2.	Gender						
	a. Male	0	7	1	8	8.98	0.93* (df=2)
	b. Female	5	59	17	81	91.01	
3.	Medium of Instruction in XII standard						
	a. Tamil	3	32	11	46	51.68	1.02* (df=2)
	b. English	2	34	7	43	48.31	
4.	Educational status of Father						
	a. Not attended school	1	6	2	9	10.11	0.36* (df=8)
	b. Primary	1	2	4	27	30.33	
	c. Secondary	3	25	10	38	42.69	
	d. Graduate	0	9	2	11	12.35	
	e. Post graduate	0	4	0	4	4.49	
5.	Educational status of Mother						
	a. Not attended school	1	8	2	11	12.35	2.75* (df=8)
	b. Primary	1	22	5	28	31.46	
	c. Secondary	2	27	7	36	40.44	
	d. Graduate	1	6	3	10	11.23	
	e. Post graduate	0	3	1	4	4.49	
6.	Occupation of the Father						
	a. Govt. employee	1	9	2	12	13.48	13.56* (df=8)
	b. Private employee	1	16	5	22	24.71	
	c. Business	0	11	4	15	16.85	
	d. Coolie	0	21	6	27	30.33	
	e. Contract work	3	9	1	13	14.60	
7.	Occupation of the Mother						
	a. Govt. employee	0	4	1	5	5.61	6.71* (df=8)
	b. Private employee	1	6	2	9	10.11	
	c. Business	1	2	0	3	3.37	
	d. Coolie	0	12	3	13	14.60	
	e. House wives	3	44	12	59	66.29	
8.	Area of family's residence						
	a. Rural	3	26	10	39	43.82	3.98* (df=4)
	b. Urban	0	23	5	28	31.46	
	c. Semi urban	2	17	3	22	24.71	

*-Not significant (p<0.05 level)

Fig.1



A study by Ravert (2008) assessed the development of critical thinking skills with simulation and the results indicated growth in critical thinking skills. Khosarvani *et al.*, (2005) identified group dynamics as a strategy to promote the critical thinking ability of Nursing students. Statistically significant results were identified in all four clinical report forms which were developed based on the steps of Nursing process.

Conclusion

The results showed that nursing students had low Critical Thinking Score and there is not much association between their critical thinking score and base line data. However, the low critical thinking scores of the participants in the present study may be attributed to the instruments used in the present study. There is a need to develop discipline specific tool to assess the critical thinking ability of Nursing students. The present education system throws light on the aspect of critical thinking, however it lacks preparing them adequately to handle the difficult situations in patient care. Moreover, revising the curriculum and preparing nurse educators for implementation of innovative small group teaching methods is needed to make it possible. Hence it can be concluded that today's Nursing students are the pillars of the health care delivery system and there is a need to develop abilities like critical thinking, clinical reasoning

and problem solving to promote safe, effective nursing practice.

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