

Impact of Critical Thinking and Problem Solving Skills on Academic Achievement among Nursing Students'

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Abstract

Background: Nowadays all higher educational institutions should develop and enhance their student's critical thinking and problem solving skills to be sure that its products meet or exceed market requirements. this study **aimed** to determine the impact of critical thinking and problem solving skills on academic achievement among nursing students, **Setting;** Faculty of Nursing Sohag University **The subjects:** No. = (448) students all 1st and 4th years, they examined using critical thinking, problem solving questionnaires and students achievement sheets, used descriptive correlational research design. The results revealed that; about (55.7%) of 4th and (49%) of 1st years nursing students were females, the 1st year nursing students had unsatisfactory critical thinking (68.8%) and problem solving skills (63.73%), while the 4th year had satisfactory critical thinking (84.03%) and problem solving skills (78.96%) with achieved point. The present study **concluded** that, there were positive correlations and statistical significant relation at 1st and 4th years nursing student's academic achievement with total critical thinking and problem solving skills for different nursing courses. The findings of the present study **recommended** that; critical thinking and problem solving skills measurements and development should be emphasized for undergraduates and postgraduates students and the importance of organized specialized training and workshop for nursing students to improve their critical thinking and problem solving skills.

Key Words: Nursing students, Critical Thinking, Problem Solving skills, Academic Achievement.

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Introduction

The practice of nursing requires critical thinking and problem solving skills. A nurse should have the ability to implement proficient nursing practices in the actual field of clinical nursing as solving problems smoothly. Nurses must acquire important characteristics or behaviors which related to critical thinking and problem solving skills

(Ericksen, 2017). The nursing profession attract persons who have natural care abilities, talent for science and a desire to help others. But there are another important skills lead to successful nurses share and often over-looked it: the ability to think critically and problem solving, (Alfaro-LeFevre, 2014).

Critical thinking refers to the ability to analyze information objectively and make a reasoned judgment. It

involves the evaluation of sources, such as data, facts, observable phenomena, and research findings. Good critical thinkers can draw reasonable conclusions from a set of information, and discriminate between useful and less useful details to solve problems or make decisions (Doyle 2020). 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 (Alfaro-LeFevre, 2014). Critical thinking involves the differentiation of statements of fact, judgment, and opinion. The process of critical thinking requires the nurse to think creatively, use reflection, and engage in analytical thinking (Ginting 2016).

Critical thinking is applied by professional nurses in the process of solving problems of patients and decision-making process with innovation to enhance the effect. It is very essential process for a safe, efficient and skillful nursing intervention. In nursing education there is frequent reference to critical thinking and its importance in daily clinical nursing practice, (Papathanasiou et al. 2014). The main critical thinking skills in which nursing students should be exercised during their studies. Specific behaviors are essentials for nursing students in order to learn and apply critical thinking, (Doyle 2020).

Critical thinking is an essential skill needed for the identification of client problems and the implementation of interventions to promote effective care outcomes. The process of providing feedback and reflection is vital to the improvement of nursing practice. Critical thinking in nursing involves habits of the mind and requires the implementation of cognitive skills, (Victor-Chmil 2013). Nurse educators spend more time with students in classrooms and clinical units,

to prepare them to use practical critical thinking and problem solving skills and sound judgment for safe and healthy patient care, and ensure the students can incorporate critical thinking and problem solving skills into everyday practice, (Wilkinson, 2012).

Problem solving is the intellectually disciplined process of actively and skillfully conceptualizing, applying, analyzing, synthesizing, and/or evaluating information gathered from, or generated by, observation, experience, reflection, reasoning, or communication, as a guide to belief and action, (Durmaz et al. 2018).

Effective problem solving skills based on sound knowledge are expected from professional nurses. Problem solving process, which requires creative thinking, is at the heart of nursing practices. For nursing students to have adequate problem-solving skills when they start working as nurses, must be integrated theoretical knowledge with practice throughout their education, they must be encouraged to think critically of the circumstances faced and must be provided to them with an education that promotes critical thinking, (Patterson 2019). The problem solving for one situation contributes to the nurse's body of knowledge for problem solving in similar situations, (Dickson, & Flynn 2013)

Academic achievement was a simple results of knowledgeable ability but recent studies has been verified that it is a wrong idea, because there are other factors effect on students achievement, critical thinking and problem solving were from them, which lead to some of positive students failed to thrive academically and low level students may exceeded the expectations (Koncz, & Collins, 2017). The students classified

into; they utilized critical thinking and problem solving skills in classroom and clinical units to the fullest degree, they were successful students and having satisfactory level of these skills, but students who failed to utilize the level of skills in classroom or clinical units to acceptable degree they had unsatisfactory the skills (**Rangnekar, 2012**).

Such skills had essential role in formulating the students personality so, improving them must began with the students and educators as well as institutions as a whole to extended to society (**Robert et al. 2014**)

Significance of the study;

Critical thinking and problem solving skills are very important to be developed and measured among the nursing students during clinical training in hospitals, these skills gives the educators a clear insight regarding the students personality and expected level of success in the market place in the future. So, the main reason for conducting this research is to determine impact of such skills on academic achievement among the nursing students. Hopfully finding of this study aids to review and reform the teaching methods which used by nursing educators to become based on critical thinking and problem solving strategies to develop the attributes from the first years of education, and plan for training program if needed during internship year and before employment in the different health care settings.

Aim of the study:

This study aimed to determine the impact of critical thinking and problem solving skills on academic achievement among nursing students.

Specific objectives:

- 1- Determine nursing student's critical thinking skills.
- 2- Determine nursing student's problem solving skills.
- 3- Assess nursing student's achievement level.
- 4- Explore the relation between critical thinking and problem solving skills and academic achievement among the nursing students.

Research question;

- 1- What are the impact of critical thinking and problem solving skills on academic achievement among nursing students?

Subject and Method

Technical design:

a- Research design: descriptive correlational research design was used in the present study .

b- Setting: The present study was conducted at Faculty of Nursing, Sohag University.

c- Subjects: all 1styear (202) and 4th year (246) nursing students.

D-Tools of data collections: three tools were used in the present study

1- Critical Thinking Questionnaire, it included two parts. **Part one**; demographic characteristics to collect data about first and fourth years nursing students; age, and gender. **Part two**; **Critical Thinking Scale** which developed by (**Cohen, 2010**), and modified by the researchers based on the related literature, this questionnaire was developed to measure critical thinking skills for students. It consisted of 75

items classified into 7 dimensions grouped as follow; find facts (12 items); open mined (9 items); analysis (12 items); regularity (11 items); self confidence (9 items); intellectual curiosity (10 items); and cognitive maturity (12 items)

Scoring system: students asked to respond to all items with six points Likert scale as followed; strongly disagree = 1, disagree= 2, neutral = 3, sometimes agree = 4, agree = 5, and strongly agree= 6. Student's choice to each item. If they obtained $\geq 75\%$ meant they had satisfactory critical thinking skills, and if obtained $< 75\%$ meant had unsatisfactory critical thinking skills.

2- **Problem solving scale** which developed by (Tadeu, et al. 2013): and modified by the researchers based on the related literature this questionnaire was developed to measure problem solving skills for students. It consisted of 41 items classified into 5 dimensions grouped as follow; define the problem (8 items): determine problem (5 items); create a plan (12 items); implementation (11 items); and evaluation (5 items).

Scoring system: students asked to respond to all items with five points Likert scale as followed; strongly disagree = 1, disagree= 2, nutral = 3, agree = 4, and strongly agree= 5. Student's choice to each item. If they obtained $\geq 75\%$ meant had satisfactory problem solving skills, and if obtained $< 75\%$ meant they had unsatisfactory problem solving skills.

3- **Students achievement sheet:** was taken from 1st and 4th year nursing students control room (recording and monitoring students grads committee) for only nursing courses: 1) for 1st year nursing syudents were (Introduction of Medical and Surgical and fundamental of nursing) and for 4th year nursing students

were (Nursing Administration, Geriatric Nursing, Community Health Nursing and CommunityAadministration), and nursing students achievement were calculated.

Administrative Design: Official permission was obtained from the Vice dean of education and students affairs at Nursing Faculty and the head of departments responsible of the student training at the selected years.

Operational Design: it explained steps of actual implementation of the study, usually includes; preparatory phase, the pilot, and field work.

Preparatory phase: This phase took about three month from June to August 2019 which included reviewing the available literature concerning the study topic, study tools were prepared, and translated. The draft of the questionnaire was reviewed for face validity by experts opinion through a jury comprised from 5 experts (2 Professors from Medical-Surgical Nursing, 2 Professors from Nursing Administration Department and one Professor from Community Health Department) Faculty of Nursing Assuit University to test comprehension of the study tools. Content validity were measured using confirmatory factors analysis to assure importance, clearance, and accountability of all items of study tools, all items obtained more than 1.5 so all of tools items were confirmed.

Pilot study: Was done to detect any problems that may be hindered the researchers during data collection phase. It helped also in estimating time needed to fill the questionnaires form. It was carried out on 10% of the nursing students, questionnaires form took about one hour to be fill. The total period of data collection in the pilot study took about one week.

Reliability was measured using Cronbach's Alpha Coefficients methods to ensure internal consistency and its results revealed that all statements of critical thinking questionnaire were ≥ 0.89 ; and problem solving questionnaire were ≥ 0.87 .

Fieldwork: After the students finished from final exams and the results known and ensuring the clarity and understandability of the study tools the actual data collection was started by the beginning of September up to October 2019. The researchers organized a meeting with students at discussion halls at Nursing Faculty Sohag University to explain the purposes of the study, and then the researchers distributed the questionnaires form which filled by the students after adequate explanations and guidance during this period by the researchers. Students were grouped into 6 groups, three groups for first year students, and three groups for fourth year students, at a time were met with the researchers from 10 am to 11 am once every week for each group to fill skills questionnaires.

Ethical considerations:

Written agreement was taken from the ethical committee at Faculty of Nursing Sohag University, and from the Vice Dean for Education and Students Affairs to be able to collect data from 1st and 4th year nursing students. Oral agreement was taken from all 1st and 4th year nursing students participated in this study after informing them about their rights to participate, refuse, or withdraw at any time. Total confidentiality of any obtained information was ensured. The steps of the study could not entail any harmful effect on the students.

Statistical design: Statistical analysis were done using statistical

software package for social science (SPSS version 19). Data were presented using descriptive statistics in the form of frequencies and percentages for qualitative variables mean and standard deviation were calculated. The Pearson correlation coefficient analysis was used to determine whether there were significant relationship and multiple regression analysis were used for assessment of the inter-relationships among quantitative variables. A Nova test for multiple group comparison $P \leq 0.05$ (Significance).

Results

Table (1): revealed that all 1st and 4th years nursing students age from 18 to 26 year old. The mean age of the sample was $(19.62 \pm .675)$ for 1st year and (22.91 ± 1.182) for 4th year. About (51%) of 1st year were females, and (44.3%) of 4th year.

Table (2): depicted that the 1st year nursing students had unsatisfactory skills regarding all critical thinking (68.80%), and problem solving (63.73%) dimensions.

Table (3): depicted that the 4th year nursing students had satisfactory skills regarding all critical thinking (84.03%), and problem solving (78.96%) dimensions.

This table (3): depicted that regarding total academic achievement the 4th year nursing students the highest mean scores were in Community Nursing and Nursing Administration (**159.74 \pm 17.48 and 153.55 \pm 20.65**) respectively and lowest mean score was in Geriatric Nursing (**78.73 \pm 10.93**), while 1st year nursing students achieved highest mean score in Introduction of Medical Surgical (**157.67 \pm 28.79**). Also there was statistical significant difference between

student's achievement 1st and 4th years for all different nursing courses P-value <0.005

Table (5): There were positive correlations and statistical significant relation at 1st and 4th years nursing student's academic achievement with total critical thinking skills for different nursing courses.

Table (6): There were positive correlations and statistical significant relation at 1st and 4th years nursing

Table (1): Frequency and percentage distribution of demographic data for 1st and 4th years nursing students' (no. =202 + 246)

Socio demographic data	1 st year students		4 th year students		
	No.	%	No.	%	
Age	18	3	1.5	0	0.00
	19	90	44.6	0	0.00
	20	90	44.6	0	0.00
	21	19	9.4	9	3.7
	22	0	0.00	112	45.5
	23	0	0.00	57	23.2
	24	0	0.00	32	13.0
	25	0	0.00	32	13.0
	26	0	0.00	4	1.6
	Mean ±SD(range)	19.62 ± .675 (18- 21)		22.91 ± 1.182 (21- 26)	
Gender	Male	99	49.0	137	55.7
	Female	103	51.0	109	44.3

Table (2): Frequency distribution of the overall critical thinking and problem solving skills (clusters/dimensions) for 1st year students (no.=202)

Clusters / dimensions	Max Score	Max		Achieved		Skills
		(%)	Points	(%)		
Critical thinking skills	Find the facts	60	(100%)	43.92	73.19%	unsatisfactory
	Open mind	45	(100%)	29.34	65.19%	unsatisfactory
	The analysis	60	(100%)	43.41	72.35%	unsatisfactory
	Regularity	55	(100%)	34.35	62.45%	unsatisfactory
	Self confidence	45	(100%)	32.39	71.98%	unsatisfactory
	Intellectual curiosity	50	(100%)	35.68	71.36%	unsatisfactory
	Cognitive maturity	60	(100%)	38.90	64.84%	unsatisfactory
	Total	375	(100%)	257.99	68.80%	unsatisfactory
Problem solving	Define the problem	40	(100%)	25.95	64.86%	unsatisfactory
	Determine the problem	25	(100%)	16.36	65.43%	unsatisfactory
	Create a plan	55	(100%)	34.83	63.33%	unsatisfactory
	Implementation a plan	55	(100%)	34.79	63.26%	unsatisfactory
	Evaluation a plan	25	(100%)	15.54	62.16%	unsatisfactory
Total	200	(100%)	127.46	63.73%	unsatisfactory	

Table (3): Frequency distribution of the overall critical thinking and problem solving skills (clusters/dimensions) for 4th year students (no.=246)

	Clusters / dimensions	Max		Achieved		Skills
		Score	(%)	Points	(%)	
Critical thinking skills	Find the facts	60	(100%)	47.78	79.63%	satisfactory
	Open mind	45	(100%)	35.97	79.94%	satisfactory
	The analysis	60	(100%)	50.55	84.25%	satisfactory
	Regularity	55	(100%)	42.91	78.02%	satisfactory
	Self confidence	45	(100%)	44.10	98.00%	satisfactory
	Intellectual curiosity	50	(100%)	45.11	90.21%	satisfactory
	Cognitive maturity	60	(100%)	48.71	81.19%	satisfactory
	Total	375	(100%)	315.13	84.03%	satisfactory
Problem solving	Define the problem	40	(100%)	31.72	79.31%	satisfactory
	Determine the problem	25	(100%)	20.54	82.18%	satisfactory
	Create a plan	55	(100%)	43.44	78.99%	satisfactory
	Implementation	55	(100%)	41.65	75.72%	satisfactory
	Evaluation	25	(100%)	20.56	82.24%	satisfactory
		Total	200	(100%)	157.92	78.96%

Table (4): Frequency and percentage distribution of 1st and 4th years student's total academic achievement in different nursing courses (no. = 202 + 246)

Academic achievement	4 th year students								1 st year students				P. value
	Nursing Administration		Community Nursing		Geriatric Nursing		Community Administration		Introduction of Med-Surg		General of Med-Surg		
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	
Weak	2	.8	0	0	3	1.2	3	1.2	10	5.0	16	7.9	0.003*
Passed / accepted	24	9.8	7	2.8	22	8.9	9	3.7	18	8.9	67	33.2	
Good	62	25.2	46	18.7	44	17.9	52	21.1	26	12.9	77	38.1	
Very good	84	34.1	98	39.8	83	33.7	85	34.6	63	31.2	42	20.8	
Excellent	74	30.1	95	38.6	94	38.2	97	39.4	85	42.1	0	0.0	
Mean ±SD	153.55 ± 20.65		159.74 ± 17.48		78.73 ± 10.93		78.85 ± 12.63		157.67 ± 28.79		130.35 ± 25.68		

Table (5): Correlation between 1st and 4th year nursing students critical thinking skills and total academic achievement in different nursing courses (no. =448).

Clusters / dimensions	4 th year students			1 st year students		
	Nursing Administration	Community Nursing	Geriatric Nursing	Community Administration	Introduction of Med-Surg	General of Med-Surg
Find the facts	.555	.783	.490	.534	.954	.177
	.038*	.018*	.044*	.040*	.004**	.095
Open mind	.461	.118	.302	.251	.249	.626
	.047*	.064	.066	.074	.081	.035*
Analysis	.943	.322	.246	.707	.724	.475
	.005**	.063	.074	.024*	.025*	.050*
Regularity	.637	.952	.248	.801	.955	.659
	.030*	.004**	.074	.016*	.004**	.031*
Self confidence	.175	.173	.519	.407	.968	.642
	.006**	.007**	.041*	.053	.003**	.033*
Intellectual curiosity	.265	.208	.108	.391	.752	.788
	.000**	.001**	.092	.045*	.022*	.019
Cognitive maturity	.174	.192	.553	.226	.817	.897
	.006**	.002**	.038*	.000**	.016*	.009**
Total	.157	.171	.879	.156	.930	.705
	.014*	.007**	.010*	.041*	.006**	.027*

** . Correlation is significant at the < 0.01 level (2-tailed).

* . Correlation is significant at the < 0.05 level (2-tailed).

Table (6): Correlation between 1st and 4th years nursing students problem solving skills and total academic achievement in different nursing courses (no. =448).

Clusters / dimensions	4 th year students			1 st year students		
	Nursing Administration	Community Nursing	Geriatric Nursing	Community Administration	Introduction of Med-Surg	General of Med-Surg
Define the problem	.213	.221	.215	.204	.372	.671
	.001**	.000**	.049*	.041*	.033*	.030*
Determine the problem	.127	.229	.554	.504	.467	.686
	.047*	.077	.038*	.043*	.051	.029*
Create a plan	.261	.227	.148	.126	.639	.581
	.000**	.000**	.020*	.048*	.033*	.039*
Implementation	.200	.106	.123	.794	.896	.367
	.002**	.098	.098	.017*	.009**	.044*
Evaluation	.223	.186	.150	.362	.958	.207
	.000**	.003**	.018*	.058	.004**	.089
Total	.258	.205	.131	.187	.689	.416
	.000**	.001**	.040*	.044*	.028*	.047*

Table (7): Relation between 1st year nursing students academic achievement mean score of different nursing courses and demographic characteristics (no.=202).

Demographic data	N.	Introduction of Med-Surg		General of Med-Surg		
		Mean \pm SD	P. value	Mean \pm SD	P. value	
Gender	Male	99	154.31 \pm 28.5	0.104	128.91 \pm 23.92	0.437
	Female	103	160.9 \pm 28.85		131.73 \pm 27.305	
Age	18-19	93	157.88 \pm 32.40	0.924	129.40 \pm 27.06	0.631
	20-21	109	157.49 \pm 25.48		131.15 \pm 24.53	

Table (8): Relation between 4th year nursing students academic achievement mean score of different nursing courses and demographic characteristics (no.=246).

Demographic data	N.	Nursing Administration		Community Nursing		Geriatric Nursing		Community Administration		
		Mean \pm SD	P. value	Mean \pm SD	P. value	Mean \pm SD	P. value	Mean \pm SD	P. value	
Gender	Male	137	154.05 \pm 20.92	0.670	161.65 \pm 16.59	0.054	79.41 \pm 10.83	0.280	78.08 \pm 14.68	0.285
	Female	109	152.92 \pm 20.37		157.34 \pm 18.33		77.89 \pm 11.05		79.82 \pm 9.42	
Age	21-23	178	153.00 \pm 20.52	0.503	159.99 \pm 16.83	0.719	79.03 \pm 11.13	0.489	78.98 \pm 12.27	0.798
	24-26	68	154.98 \pm 21.07		159.09 \pm 19.19		77.95 \pm 10.44		78.52 \pm 13.63	

Discussion:

Critical thinking and problem solving are transferable skills which can influence on the quality of human life. Nurses are need it in decision making situations in patient care, and the decision they make affect in patient outcomes. Nursing critical thinking and problem solving skills support the process of decision making and affect on the quality of care provided. The way for the nursing students to implement such skills is by apply the nursing process to their thought, which needs apply in the learning environment. Nursing students should find that, there are many correct solutions for a problem, to select the best correct solution and will be the most efficient and best fit for the situation. (Sung-ju & Sun-hee 2015).

Critical thinking and problem solving skills are that have to be imparted to the nurses during their education because nurses face many situations, where they have to use their skills to take critical decisions while practicing their profession (Akca and Selen, 2015). These skills considered the foundation for academic achievement and career success (Mohamed et, al., 2019)

This study was conducted with the aim to determine the impact of critical thinking and problem solving skills on academic achievement among the nursing students. The present study depicted that 1st and 4th years students age from 18 to 26 years old. About half of 1st year were females, while fifty five percent of 4th years students were males.

The study showed that the sample age ranged from 18 to 26 years, this result was in same line with **(Harrison, 2019)** in his study entitled " Student nurses' gender role is a predictor of caring behaviors and critical thinking " and reported that sample age ranged between 19 to 29 years. This study disagreed with **(Magerman, 2011)** study entitled " academic factors affecting learning at a nursing college in the western cape" and found range of age among studied sample was 17 to 41 years.

About near half of nursing students were females of 1st year & 4th years. This result disagreed with **(Kim and Choi, 2014)** his study "The Relationship between Problem Solving Ability, Professional Self Concept, and Critical Thinking is position of Nursing Students" and reported that (95.2%) students were females, and (4.8%) students were males, difference between studies due to increases in the attendance females in nursing collage and few males intersted with nursing function

The present study showed that the highest percentage of 1st year nursing students had unsatisfactory critical thinking skills, while the highest percentage of 4th year had satisfactory critical thinking skills for all critical thinking dimensions. These findings agreed with study of **(Ozcan & Elkoca, 2019)** they studied" Critical Thinking Skills of Nursing Candidates" and reported that the level of critical thinking skills in nursing first class was unsatisfactory, and with advancement class of students had increased level of critical thinking (high). And agreed with **(Park & Choi 2015)** who reported that, learning attitudes and critical thinking disposition were significantly improved in the experiment group. **(Papathanasiou et al., 2014)** reported that, critical thinking is an essential process for the

safe, efficient and skillful nursing practice and the nursing education programs should adopt attitudes that promote critical thinking and mobilize the skills of critical reasoning.

The present study depicted that, the highest percentage of the 4th year nursing students had satisfactory problem solving skills, while 1st year nursing students had unsatisfactory problem solving skills regarding all problem solving skills clusters. This findings of the study was consistent with **(Çinar et al., 2010)** who assessed "Problem solving skills of the nursing and midwifery students and influential factors" and reported that the problem solving skills of the students improved with the increased number of years of education, and they showed the problem solving skills increased with the increasing number of years of education. This result may be due to increased knowledge and practice on the nursing profession from year to year during study, and increase thier experiences may be effective to become the education parallel to the students' critical thinking and problem solving levels.

The present study revealed that the 4th year nursing students achieved highest mean scores for Community Nursing and Nursing Administration and lowest mean score in Geriatric Nursing. These findings were inconsistent with the results of **(Mohamed et al., 2019)** who conducted study entitled "Relationship between Soft Skills and Academic Achievement among 4th Year Nursing Students" and revealed that the 4th year nursing students achieved highest mean score in critical care nursing and lowest mean score in nursing administration course. This result may be not only be attributed to probable differences in learning styles of students but also to the relatively different

teaching subjects and facilities available for different nursing departments.

The result of the present study depicted that, there were positive correlations and statistical significant relation at 1st and 4th years nursing student's academic achievement with total critical thinking skills for different nursing courses, *table (5)*; this results agreed with (Mohamed et al., 2019) they reported that there were positive correlation between 4th year nursing student's academic achievement and soft skills in all nursing courses. These findings disagreed with (Kanbay et al. 2017) they measured the critical thinking skills of nursing students at the beginning and end of the academic year, they determined that there was no statistically significant improvement in the critical thinking skills of students. This result may be due to most nursing courses are not concentrated on critical thinking skills, and methods of teach and train are not included enough skills about it.

The result of the present study depicted that, there were positive correlations and statistical significant relation at 1st and 4th years nursing student's academic achievement with total problem solving skills for different nursing courses, *table (6)*; this results disagreed with (Durmaz, et al., 2018) who reported that, there were a negative correlation detected between problem-solving skills and communication skills of students. (Park & Choi 2015) reported that, problem-based learning contributed to improving learning attitudes, critical thinking disposition and decision making and assessment sub areas of problem solving skills in nursing students. This result may be due to the heavy teaching hours of nursing not gives students a chance to focus on personal growth they become focused on recalling knowledge and far away from problem solving skills.

In the present study showed that, there was no statistical significant relation between academic achievement in different nursing courses and age and gender for 1st and 4th years nursing students. This findings agreed with (Shirazi & Heidari, 2019) they reported that no statistical significant difference between age and academic achievement among their studied sample. And (Kim & Choi, 2014) in their study entitled "The Relationship between Problem Solving Ability, Professional Self Concept, and Critical Thinking is position of Nursing Students" and reported that there was no statistical significant difference with age. This result may be due to all students for both 1st and 4th years nursing students' males and females study and train on the same nursing courses with the same policy without difference.

Conclusion:

The present study finding offered insight regarding impact of critical thinking and problem solving skills on academic achievement in different nursing courses among the nursing students it can be concluded that:

- The 1st year nursing students had unsatisfactory critical thinking and problem solving skills, while students of the 4th year had satisfactory critical thinking and problem solving skills.
- The 4th year nursing students achieved highest mean scores for nursing course.
- There were positive correlations and statistical significant relation at 1st and 4th years nursing student's academic achievement with total critical thinking and problem solving skills for different nursing courses.

• There were no statistical significant relation between academic achievement in different nursing courses with age and gender for 1st and 4th years nursing students.

Recommendation: based up on result the following recommendations are drawn;

▪ Evaluate student's critical thinking and problem solving skills when interviewing them before admitting them to Nursing Faculty through acceptance tests.

▪ Nursing faculty academic teaching staff should carefully review and incorporate the desired critical thinking and problem solving skills into their curricula.

▪ Encourage academic teaching staff to include critical thinking and problem solving skills measurements and development to undergraduates and post graduates students.

▪ Organize specialized training and work shop for nursing students to improve critical thinking and problem solving skills.

Conflict of interest:

There is no conflict of interest and no fund from any institution.

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