Effect of Inquiry-Based Learning versus Conventional Approach on Maternity Nursing Students' Satisfaction, Motivation and Achievement

[1]Nevin Samir Metwally, [1]Randa Mohamed Ebrahim and [2]Ahmed husseiny

[1]Maternal and Gynecological Nursing Department, Faculty of Nursing Ain Shams University, Cairo, Egypt
[2]Obstetric and Gynecological Department, Faculty of medicine, AinShams University, Cairo, Egypt

Abstract: Inquiry based learning (IBL) is a student-centered approach that foster motivation to learn. In addition, students' decision-making and problems solving skills independently improved. Aim of the study was to investigate the effect of IBL on maternity nursing students' satisfaction, motivation and achievement. A quasi experimental research design was used. A purposive sample technique was used to recruit 396 nursing students at Maternity and gynecology nursing department at academic year 2014-2015 and 2015-2016. The present study was conducted at Maternity and gynecology nursing department at Faculty of Nursing at Ain Shams University. Four tools of data collection were used (1st Self-administered questionnaire, 2nd Pre/post-test "written exams", 3rd students' satisfaction scale and 4th Academic motivations scale. Results: there is no statistical significant difference between conventional group and IBL group regarding their theoretical achievement at pre-test. While, there is a highly statistical significant difference between conventional group and IBL group regarding their theoretical achievement at post-test and follow up. In addition, there is a highly statistical significant difference between conventional group and IBL group regarding their satisfaction and motivation. Conclusion: Student's theoretical achievements of antenatal unit, satisfaction and motivation were statistically higher among IBL than conventional learning group. Recommendation: application of inquiry based learning as a method of teaching at all nursing faculties. Further research still needed to evaluate the effect of applying IBL approach on student's practical achievements.

Key words: Inquiry-Based Learning · Conventional · Nursing Students · Satisfaction · Motivation · Achievement

INTRODUCTION

The ultimate goal for nursing faculties are to produce nursing graduates that think critically and apply technical skills in complex patient care situations. Effective teaching method should positively affect student's motivation and achievement. Improving education of nursing proffessional can contributue to improved women care and outcome [1].

Conventional educational curriculum is teacher-centered teaching method designed around subject areas or disciplines. A major feature of this educational philosophy is a hierarchical view of teacher and students, in which the faculty teaches and students learn by listening to the teacher. The teacher develops structured packages of theoretical knowledge complete with analysis, insight and conclusions, while students are expected to take notes, memorize and master the imparted information. Hence, conventional educational method is teacher-centered, with students passively receiving information given by the lecturer. Moreover a conventional teaching-learning environment tends to generate shallow, surface thinkers who primarily rely on rote memory rather than careful understanding of the content [2].

On the other side, nursing graduates must be prepared to identify the actual and potential health problems of patients, act in a professional and ethical manner when faced with complex situations. They must be able to identify human and material resources, identify their own learning needs, setting goals, choose learning strategies and evaluate results of the learning process [3].

Corresponding Aothur: Randa Mohamed, Maternal and Gynecological Nursing Department,
Faculty of Nursing Ain Shams University, Cairo, Egypt. E-mail: randam_5174@yahoo.com.

So the academic staff at the faculties of nursing should use variety of teaching strategies that equip their graduates with knowledge and skills necessary for competent nursing knowledge and practice [4].

One of the challenges of higher nursing science education is developing higher oreder cognitive, affectve and psychomotor skills in undergraduate students. This is achieved by stimulating inquiry analysis, creating independent judgment and developing skills that are required in clinical practice [5].

Inquiry-based learning (IBL) is a learning approach that stimulates active, self-directed, contextual and collaborative learning, based on active participation, problem-solving and critical thinking. This method emphasizes student's active engagement in their learning. Cooperative learning theory reflected in IBL promotes group working where students are actively involved in the intellectual work of organizing process, explaining it, summarizing it and integrating it into existing conceptual theoretical structures [6]. In an enquiry-based learning environment, the teacher takes the back seat and adopts a facilitator role. Instead of imparting knowledge, the teacher helps students with the process of discovering knowledge themselves. EBL has gained much popularity in recent years [7].

Inquiry Cycle Model was developed based on cognitive theory of learning. Many forms of the learning inquiry cycle appear in curricula with phases ranging from 4E to 7E. One of the most models that applied in different curricula was 5E learning cycle model [8]. The 5E learning cycle model lists ?ve inquiry phases: *(Engagement, Exploration, Explanation, Elaboration and Evaluation).* This ?ve inquiry phases were used by educator to design educational curriculum. *Engagement:* nursing teacher accesses the learners' prior knowledge and helps them become involved in a new concept through the use of short activities that foster curiosity and stimulate prior knowledge. *Exploration:* experiences provide students with a common base of activities within which current concepts (particularly misconceptions), processes and skills are identified and conceptual change is facilitated [9].

Moreover, Explanation: focuses students' attention on a particular aspect of their engagement and provides opportunities to demonstrate their conceptual understanding, process skills, or behaviors. *Elaboration:* after receiving explanations about main ideas and terms for their learning tasks, it is important to involve the students in further experiences that extend, or elaborate,

the concepts, processes, or skills. *Evaluation:* This is the important opportunity for students to use the skills they have acquired and evaluate their understanding. In addition, the students should receive feedback on the adequacy of their explanations [9].

The application of inquiry based learning in nursing education presents additional challenges and benefits to both nursing educator and student. The benefits of IBL for students are providing opportunities for team working and development of collaborative working skills that form integral part of midwifery practice. It also helps students to gain a better understanding of the topics being studied through development their literature search skills, problem solving skills, presentation of information to colleagues and others. Furthermore, the process of IBL qualifies students to develop skills in clinical reasoning, critical appraisal and information gathering. As students learn to relate theoretical knowledge to clinical practice, it helps in closing theory- practice gap [10].

Inquiry based learning (IBL) is one of important pedagogical strategies that foster motivation to independent learning. Motivation is one of the essential psychological concepts for nursing students to achieve successful learning outcome [11]. Furthermore there are different kinds of motivators that stimulate students to direct their learning to the favorite outcome. Motivating students in the classroom and providing them with chance for clinical practice are essential factors in the teaching-learning process. Student-centered approaches to learning are progressively adopted to motivate students for better learning. Students must principally consider education as personally related to their interests and goals for being motivated to learn [12].

Motivation is defined as the inner force that stimulates a person to action. The most complicated part for nursing educator is keeping students motivated to finish activity. Motivation to learn is the ability modeling, communication and direct instructions by others such as parents, peers and educator [13]. Academic motivation has different aspect which is correlated with learning and academic achievement. Moreover, education motivation is consisting of individual's beliefs in ability in carrying out a certain task or activity [11].

Furthermore, motivation can be classified into three categories; *intrinsic, extrinsic and amotivation (absence of motivation).* Intrinsic motivation is define as participate in an activity to achieve individual benefit. So, individual select the activity for her or his satisfaction and is autonomous in performing it. The intrinsic motivation

required more effort from student. Therefore, students with intrinsic motivation would develop goal to learn and to achieve. There are three sub-factors within intrinsic motivation: "to Know, to Accomplish and to Experience Stimulation". Several elements in student-centered learning environments may enhance students' intrinsic or extrinsic motivation. Extrinsic motivation motives that is external and separate from person. There are three sub-factors included in extrinsic motivation: Identified regulation, introjected regulation and external regulation. While, amotivation is absence of motivation [14].

Student's satisfaction with learning is defined as the degree to which students believe they have opportunity to be involved in learning activities and to receive feedback about their learning. The role of nursing educator to enhance students' satisfaction is associated with "accomplishment students to professional competency" that involves in IBL process. Also, nursing educator can enhance students' satisfaction through implementation of effective teaching strategies that are appropriate for students' needs and health care services development [15].

Inquiry-based learning (IBL) as one of student-centered learning approach enhances students' motivation for learning, understanding and retention of knowledge which has a direct effect on student's achievements [11]. In the present paper, researchers put a light on students' satisfaction, motivation and achievement about different learning approach. Finally, learning strategy has direct relationship with academic motivation and satisfaction that reflected upon academic progress and achievement of students.

Significant of the Study: Teaching methods considered a big challenge for nursing educator is to provide relevant frameworks upon which the student can construct knowledge, understanding and to act as a facilitator rather than knowledge-bearer during the process. Students must become much more actively engaged in their learning experience, rather than act as passive recipients of information. This may prove challenging for those students who are used to didactic approaches and may feel frustration, anxiety and insecure about their ability succeed using this approach to their learning or feel unsafe doing that [16].

Nursing is a practice-based profession. There is a consensus that new educational models are required for students to develop their knowledge, skills and abilities to be critical thinkers, independent decision makers, lifelong learners, effective medical team members and competent users of new information technologies. Therefore, researchers suggested the present study aiming for discovering the most effective learning model for adequately preparing nursing students to face real hospital challenges, put their knowledge into action to enable their patients to move to health and enable the profession to grow and mature.

Aim of the study: This study aims to investigate the effect of inquiry-based learning on maternity nursing students' satisfaction, motivation and achievement through the following:

- Assess the effect of inquiry-based learning versus conventional teaching methods on maternity nursing students' satisfaction.
- Evaluate the effect of inquiry-based learning versus conventional teaching methods on maternity nursing students' motivation
- Investigate the effect of inquiry-based learning versus conventional teaching method on maternity nursing students' achievement.

Research Hypothesis: The current study hypothesized that: Inquiry-Based learning has positive effect on maternity nursing students' motivation and achievement than conventional teaching method.

MATERIALS AND METHODS

Research Design: Quasi experimental design was utilized to meet the aim of the study.

Research Setting: The present study was conducted at Maternity and gynecology nursing department at Faculty of Nursing at Ain Shams University.

Subjects: A purposive sample technique was used to recruit 446 nursing students at maternity and gynecology nursing department at academic year 2014-2015 and 2015-2016. Those students were divided into two groups (study "inquiry based learning and control "conventional learning). Data was collected at academic year 2014-2015 for control group and for study group at academic year 2015-2016. The final sample size was reached 396 students because 18 students were drop out in IBL group due to absent of some sessions, some of students didn't complete data collection sheets, Also other 32 students were shared in pilot study were excluded.

Exclusion Criteria: Nursing students had previous experience with Inquiry based learning in both groups

Tools of Data Collection: Four tools of data collection were used as the following:

- Self-administered questionnaire that was constructed by researchers after reviewing the related literature. It was divided in 2 parts and consisted of (28) questions of open and closed-ended types: the *first part*; included assessment of student personal data and past learning experience (questions: 1- 5). *Second part;* included students' assessment of teaching process questions (6-11), learning strategies questions (12- 15), facilitator characteristics questions (16- 21) and learning strategies questions (22- 25). In addition to open-ended questions to assess student's evaluation of learning approach (conventional and IBL). It took 15 minutes to be filled by students. Cronbach's alpha coef?cient was 0.92.
- Pre / post-test "written exams" to assess students' theoretical achievement: theoretical achievements assessment tests were used for both groups, tests developed by research team. Exams were designed to assess the different domains of learning. Cronbach's alpha coef?cient was 0.80. The students' achievement in the exam was scored according to the operational scoring system at the academic setting in Egypt as follows: (1) Excellent: 85%-100%, (2) Very good: 75%-85%, (3) Good: 65% -<75% and (4) Pass: 60% - <65%.
- Students' satisfaction scale with teaching process was measured using a scale developed by Levett-Jones *et al.* [17]. This scale included 24 items: teaching process (6 items), teaching strategies (8 items), facilitator (researchers) / educator (6 items) and teaching materials / resources (4 items). Each item was scored on a 5-point Likert scale (1 = not satis?ed at all, 2 = not satis?ed, 3 = moderately satis?ed, 4 = satis?ed, 5 = very satis?ed). Students consider satisfied with teaching process if student's total score was = 60%. It took 15 minutes to be filled by students. Cronbach's alpha coef?cient was.97.
- Academic motivations scale (AMS) it was adapted from Perrot *et al.* [18] it modified by researchers. It consists of 28 items of 7 subscales cover 3 different aspects. There are three subscale of *extrinsic motivation* (external regulation, introjected regulation, identified regulation). While, three sub-types of *intrinsic motivation* are (knowledge,

accomplishment, stimulation); and *a motivation*. Four of the items in the AMS are related to a motivation, 12 to extrinsic motivation and 12 to intrinsic motivation. The scoring is: "It does not fit" (1) "somewhat fits" (2), "moderately fits" (3), "strongly fits" (4) and "completely fits" (5) in the five point Likert scale. It took 15 minutes to be filled by students. Cronbach's alpha coef?cient was 0.97.

Operational Definition:

- *Intrinsic motivation*: refers to taking some action for the enjoyment purpose or satisfaction that student receive. The motivation for acting can be found in the action itself and not in some external force (i.e., a reward or outcome).
- *Extrinsic motivation* refers to taking some action in order to obtain a reward or outcome. Instead of doing something because it is fun, people who are extrinsically motivated act based on what they receive as a result.
- *A motivation* refers to absence of motivation.
- *External Regulation* – behaviour is controlled by rewards, threats and possible pressure.
- *Introjected Regulation* – the individual perform activity to avoid negative feelings, such as guilt
- *Identified Regulation* – the individual participate on the activity to gain the outcome benefits of participation

Validity and Reliability: Tools were reviewed by a panel of 5 experts in obstetric and gynecological nursing field to test the face and content validity. Each of the experts was asked to examine tools for content coverage, clarity, wording, length, format and overall appearance. Modifications were done according to the comments "rephrasing and cancelling for two questions". Reliability: Alpha Chronbach test was used to measure the internal consistency of the tools used in the current study.

Ethical Considerations: An official approval was obtained from the Dean of the Faculty of Nursing Ain Shams University. The aim of the study was explained to each student and informed consent to participate was obtained. The students were given an opportunity to refuse to participate and they could withdraw at any stage of the research. Additionally, they were assured that the

information would be confidential and used for the research purpose only without any effect on the students current or future academic course assessment.

Field Work: Pilot study was conducted before data collection for (32) students. It was conducted to evaluate the efficiency and content validity of the tool, to find the possible obstacles and problems that might be faced during data collection. Students included in the pilot study were excluded from the sample, to avoid contamination of research sample.

Data collection for this study was carried out in the period of academic year 2014/2015 for control group and academic year 2015-2016 for IBL group. Researchers first explained the aim of the study to the participants and reassure students that information collected would be treated confidentiality and that would be used only for the purpose of the research without implication for their course grade. Implementation phase was divided into four stages for control and study groups:

For Control Group (Conventional Learning Method): Students attended the academic year (2014-2015) were following the conventional method of teaching regarding normal antenatal care as following consequence:

1st Pre- Educational Session: Researchers prepared scientific content as handout of lecture related to antenatal care that including the following items; objectives, introduction, concept of antenatal care, important of antenatal care, elements of antenatal care and management of common discomforts of pregnancy. Researchers explained and distributed the 1st part of self-administered questionnaire was given to the students in addition to 2nd tool (Pre-test) to assess students' knowledge.

2nd Educational Session:

- Researchers presented scientific content in two hours according to pre designed schedule of maternity & gynecology nursing time table course.
- The lecture presented for all students through power point presentation. The researcher conduct class room group discussion for all students to clarify any point of contents. The main points of scientific content were summarized at the end of the lecture.

3rd Post-educational (Evaluation) Session: Evaluation for students' achievement was performed through using of 2nd tool (Post-test). Moreover, researchers evaluate students' satisfaction and motivation with learning methods through using of 3rd tool student's satisfaction scale and 4th tool students' motivations scale (AMS). Then inform all students about the time of follow up session after 4 weeks from the lecture.

4th Follow up Session:

- After 4 weeks from giving the lecture for all students evaluation for students' achievement was performed through using of 2nd tool (Post-test)

For Study Group (Inquiry Based Learning Method- IBL): Students attended for the academic year (2015-2016) were who follow the IBL method of learning regarding normal antenatal care as following consequence:

1st Stage (Assessment Session):

- All study group students were firstly assessed for personal data at classroom by (part 1) of self-administered questionnaire.

2nd Stage (Implementation Sessions):

- Orientation session: Researchers recommended course, learning objectives, learning method communication channels, tools and assessment procedures through learning system.
- Divided study group of students into groups: Students divided into 8 groups; each group consisted of 22 or 23 students.

1. Each group name were selected, roles of group members were defined, group leader and assisted were determined.
2. Researchers are available to suggest resources of evidence are acceptable (textbooks, research articles, websites etc….), help the learning set see learning opportunities, agree time frames and facilitate development of set rules.
3. Students' knowledge regarding normal antenatal care was done through using of 2nd tool (Pre-test) to assess students' knowledge.

•**Implement 5 E inquiry cycles as follow** *(Engagement, Exploration, Explanation, Elaboration and Evaluation.):*

- Engagement phase, researchers tried to increase students' attention, get them motivated and ready to learn. So that students had opportunities to make some connections between prior knowledge and present learning experiences about the concepts like physiological changes during pregnancy, antenatal care, management of minor discomfort during pregnancy and warning signs of pregnancy. Each group will be assigned a 30 minutes tutorial with researchers, at least once during an inquiry.
- Exploration phase, researchers aim was to create learning environments for students and observed the students activities to obtain knowledge by scientific processes, record data, plan experiments, create graphs, interpret results, develop hypotheses and organize their findings.
    - Teacher only provided questions, suggested approaches, gave feedbacks and assessed understandings. Each group members must be prepared to share learning and sources of evidence with other group members.
- Explanation phase, researchers helped students demonstrate their understanding of related concepts. Also guided students toward coherent and consistent generalizations, help students with distinct scientific vocabulary and provided questions that help students use this vocabulary to explain the results of their explorations.
- Elaboration phase, students provided an opportunity to apply their knowledge to new domains, which may include raising new questions and hypotheses to explore. A main task about the importance of antenatal care was given in elaboration stage. These sessions are a valuable opportunity to discuss findings and clarify interpretations of the information group have found.
- Evaluation phase students had opportunity to assess their understanding and abilities. During this session researchers encourage students to consider questions about findings or thoughts if an important point is being overlooked.
    - Researchers informed student that the inquiry will ready to close when: there are few new aspects of the question/problem being discovered through inquiry and student feel

more confident about answering the question or discussing practice issues rose in the inquiry processes.

3ʳᵈ Stage (Feedback and Evaluation Sessions):

- Feedback Session: at this session each group have to disseminate their final findings to each other. Researcher must ensure that each group do this effectively because the understanding of the class as a whole will be greatly enhanced or hindered by the content and delivery method chosen for the final presentation. Researcher might like to consider using the following formats to present group output: Group discussion, PowerPoint presentation, Role play, Concept map.
- Evaluation Session: at the end of last stage of 5E cycle researchers evaluate students' achievements and opinions on IBL approach through using of 2ⁿᵈ part of self-administered questionnaire in addition to 2ⁿᵈ tool (Post-test) to assess students' knowledge. Then the researchers assessed students' satisfaction and motivation with learning approach though using of 3ʳᵈ tool student satisfaction scale and 4ᵗʰ tool academic motivations scale (AMS).

4ᵗʰ Final Follow up Stage for IBL Groups: Follow up was done after 4 weeks from end of IBL cycle researchers reassessed to students' achievement by post-test "written exams.

Statistical Analysis: The data were analyzed using SPSS version 18.0. The ANOVA and $\div 2$ tests were employed to compare quantitative and qualitative variables between the groups.

RESULTS

Table (1) shows that around two thirds of the studied students in both groups are female students. While, third of the studied students in both groups are male students. Concerning marital status, the majority of studied students in both groups are single. As regard place of residence, 70.3% of students in conventional group were raised in urban area versus 70.1% of the students in inquiry based learning. Regarding educational background 82.1% of the studied students in both groups had secondary education. In addition the table clarify that no statistical significant difference between both groups regarding their socio demographic characteristics.

Table 1: Distribution of the studied students in both groups according to their socio demographic characteristics.

Items	Conventional group (n=212)		Inquiry Based Learning group (n=184)		X^2	P value
	No	%	No	%		
Gender						
Female	143	67.5%	125	67.9%	0.047	0.829
Male	69	32.5%	59	32.1%		
Marital Status						
Single	206	97.2%	179	97.3%	1.63	0.721
Married	6	2.8%	5	2.7%		
Residence						
Rural	63	29.7%	55	29.9%	0.396	0.529
Urban	149	70.3%	129	70.1%		
Educational Background						
Secondary school	174	82.1%	151	82.1%	1.329	0.249
Technical Nursing institute	38	17.9%	33	17.9%		
Age in years (Mean ± SD)	20.8±0.74		20.7±0.81		T = 0.410	0.682

Table 2: Comparison of the studied students (control and intervention) in both groups according to their satisfaction with teaching process

Items	Conventional group (n=212)	Inquiry Based Learning group (n=184)	X^2	P value
Teaching process				
Satisfactory	43.4%	67.9%	8.21	0.02*
Unsatisfactory	56.6%	32.1%		
Teaching strategies				
Satisfactory	29.7%	82.1%	12.34	0.003**
Unsatisfactory	70.3%	17.9%		
Facilitator (researchers) / educator				
Satisfactory	37.7%	71.7%	13.05	0.003**
Unsatisfactory	62.3%	28.3%		
Teaching materials / resources				
Satisfactory	67.9%	87.5%	13.73	0.002**
Unsatisfactory	32.1%	12.5%		

Table 3: Comparison of the studied students in both groups according to their motivation.

Academic motivation	Conventional group (n=212)	Inquiry Based Learning group (n=184)	F test	P value
Extrinsic Motivation				
External Regulation	7.21 ± 1.89	12.14 ± 2.3	12.94	0.002**
Introjected Regulation	8.03 ± 0.62	14.43 ± 1.67		
Identified Regulation	7.66 ± 0.43	13.51 ± 2.52		
Total Extrinsic Motivation	23.54 ± 5.51	31.14 ± 8.26	14.62	0.003**
Intrinsic Motivation				
Knowledge	6.42 ± 1.05	13.88 ± 1.78	12.64	0.001**
Accomplishment	7.52 ± 1.34	14.57 ± 2.58		
Stimulation	6.07 ± 0.93	14.28 ± 2.32		
Total Intrinsic Motivation	36.61 ± 7.32	41.62 ± 7.19	12.15	0.002**
Amotivation				
(absent of motivation)	19.63 ± 0.52	16.24 ± 0.32	10.28	0.001**
Total score	63.4 ± 7.03	96.12 ± 6.92	16.33	0.004**

Table (2) illustrates that there is a highly statistical significant difference between conventional group and IBL group regarding their satisfaction about teaching strategies, facilitator (researchers) / educator and teaching resources. While, there is highly statistical significant difference between conventional group and IBL group regarding teaching process.

Table (3) shows that there is a highly statistical significant difference between conventional group and IBL group regarding their total academic motivation scale and subscale "extrinsic, intrinsic and a motivation scale".

Table (4) reveals that there is no statistical significant difference between conventional group and IBL group regarding their theoretical achievement pre intervention. While, there is a highly statistical significant difference between conventional group and IBL group regarding their theoretical achievement post intervention and at follow up.

Table 4: Comparison between Inquiry based-learning and Conventional learning Students' achievement in Pre, Post intervention and Follow up

Theoretical achievement		Conventional (control group) (n=212)		Inquiry Based Learning (intervention group) (n=184)		X^2	P value
		No	%	No	%		
Pre-Intervention	Excellent	0	0.0	0	0.0	2.985	0.14
	Very Good	6	2.8	4	2.2		
	Good	88	41.5	78	42.4		
	Pass	100	47.2	98	53.3		
	Fail	18	8.5	4	2.2		
Post-Intervention	Excellent	6	2.8	24	13.1	14.249	0.001**
	Very Good	24	11.3	74	40.2		
	Good	76	35.8	54	29.3		
	Pass	92	43.4	32	17.4		
	Fail	14	6.7	0	0.0		
Follow Up	Excellent	2	0.9	34	18.5	13.077	0.001*
	Very Good	6	2.8	82	44.6		
	Good	88	41.5	58	31.5		
	Pass	102	48.1	10	5.4		
	Fail	14	6.7	0	0.0		

Table 5: Distribution of the studied students (control and intervention) regarding their evaluation of learning approaches

Items	No	%
IBL approach		
Strengths points of IBL @		
▪Enhance clinical decision making skills	125	67.9%
▪Enhance problem solving skills	130	70.7%
▪Enhance team work	122	66.3
▪Enhance retention of knowledge	160	86.9
Weakness points of IBL @		
▪Difficult of self and peer assessment	98	46.2%
▪Difficult adaption with new methods of learning (in the first stage)	142	66.9%
Recommendation @		
▪ Application of IBL on other nursing science	182	85.8%
▪ Groups include less number of students.	122	57.5%
Conventional approach		
Strengths points of Conventional		
▪Proper orientation of a subject	88	41.5%
▪Suitable for large group	76	35.8%
Weakness points of Conventional @		
▪Passive role of learner	140	66.0%
▪Limited time for questions or discussion.	120	56.6%
▪Little retention of knowledge	86	40.6%
Recommendation		
▪Integration between lecture and other interactive learning method.	128	60.4%

@ NB: More than one choice was offered by each student.

Table (5) shows that 86.9, 70.7 and 67.9% of the studied students on the intervention group reported that strengths of IBL are enhance their retention of knowledge, problem solving and clinical decision making skills respectively. While, 41.5 and 35.8% of the studied students on the control group reported that strengths of conventional methods are proper orientation of a subject and Suitable for large group. Concerning weak points 46.2% of intervention group reported that weakness of IBL is Difficult of self and peer assessment. Meanwhile, 66.0 and 56.6% of the control group reported that weakness of conventional method is the result of the passive role of learner and limited time for questions or discussion respectively. As regard students' recommendation for both learning approach 85.8% of the intervention group recommend application of IBL on other nursing science. While, 60.4% of the control group recommend integration between lecture and other interactive method of learning.

DISCUSSION

The challenge for nursing educator is how to prepare nursing students for their future career. So the student nurses must be confident about their knowledge and technical skills in order to work efficiently in relation to this aspect of care and choosing an appropriate educational approach which considered core in providing high quality of care [19]. In the light of the previous concept, researchers conducted this study for evaluating the effect of IBL approach on maternity nursing students' satisfaction, motivation and achievement.

The current study displayed that more than two thirds of studied sample in both groups were female students. Concerning marital status the present study indicated that the majority of studied sample of conventional and IBL groups were single. In addition regarding place of residence more than two thirds of students in both groups came from urban area. Moreover, regarding educational background most of the studied students in both groups have secondary education. Finally both groups shared in the same age, the findings showed homogeneous of studied sample and there is no statistical significant difference between both groups regarding their socio demographic characteristics.

Student's satisfaction may plays a part in academic achievement through acceptance of an active learning method such as inquiry based-learning the present findings illustrated that there is a highly statistical significant difference between conventional group and

IBL group regarding their satisfaction with teaching strategies, teaching process, facilitator (researchers) / educator and teaching resources. This may be because the student of IBL approach takes more responsibility and actively participates in their education, giving them a sense of autonomy. This study finding is supported by Hwang *et al.* [20] who conducted an experiment on an elementary school social studies course to evaluate the effects of the proposed approach on the inquiry-based learning performances of students with different learning styles. The experimental results indicate that the proposed approach effectively enhanced the students' learning effects in terms of their learning achievement, learning motivation, satisfaction's degree and flow state.

The present study findings is on the same line with Zafra-Gomez *et al.* [21] who conducted a study to determine the impact of inquiry-based learning (IBL) on students' academic performance and to assess their satisfaction with the process. Their study showed that students' satisfaction is directly associated with class attendance and motivation with the perceived usefulness of IBL, it is unaffected by attendance at tutorials.

The current study revealed that the total academic motivation score and subscale extrinsic motivation which involved three sub-factors "Identified regulation, introjected regulation and external regulation" for students of IBL group were higher than students of conventional group. This may be due to students of IBL group identified and accepted to group rules, values and doing it, because they established it or to avoid guilt.

Furthermore, there was a highly statistical significant difference between conventional group and IBL group regarding their total academic motivation score and subscale for intrinsic which involved three sub-factors within intrinsic motivation: "to know, to accomplish and to experience stimulation" the total academic motivation scale and subscale, for students of IBL group higher score than students of conventional group may be due to students being responsible for their learning themselves, being involved with reality through solving real assignments and the social aspects and cooperation with peers. On other side there was a statistical significant difference between conventional group and IBL group regarding their total academic motivation score for amotivation (or absent of motivation) the findings showed that conventional group students had a higher score than students of IBL group.

The findings of the current study are supported by this concept: Inquiry-based instruction had a positive influence on students' learning motivation. Moreover,

academic motivation plays an important role in the learning process [22]. The current study findings are in the same line with Lee and Yuan [23] that conducted a study to understand the effects of learning motivation about the achievement of the vocational universities in Taiwan and revealed a significant positive effect on study achievement, whether the students are intrinsically or extrinsically motivated.

The current study findings are also in accordance with Bayram *et al.* [24] who conducted nonequivalent control group study to determine the effect of inquiry based learning method on students' motivation and found that there is a significant difference between groups in post-test scores of extrinsic goal orientation. As inquiry based learning made positive contribution to the motivation of students in subscale of extrinsic goal orientation.

Academic achievement is outcome of education, Concerning comparison between IBL and conventional learning students' theoretical achievement in pre, post and follow up the current study illustrate that no significant difference between two studied groups in pre intervention achievement regarding antenatal care. This means that the students of both groups in the same level of knowledge at the start of the study. While, a highly statistical significant difference was found post-intervention and at follow up evaluation between IBL and conventional learning regarding students' theoretical achievement level. The current results revealed that students who have been educated by the IBL methods achieved higher score than students which were educated by the conventional method this may attributed to that IBL approach enhance problem solving skills and promote retention of knowledge.

The current study findings were in agreement with Gwo Jen Hwang *et al.* [25] who conducted a study to investigate the effects inquiry based learning model on students' cognitive load and learning achievements and reported that comparison between pre and post-tests as well as the cognitive load in both groups revealed that the students who learned with the inquiry-based mobile learning approach had better learning achievement and less cognitive load than those who learned with the traditional approach. Furthermore the present findings are assured by Abdi [8] who compared two classes taught by traditional methods with two classes taught using the (IBL) 5E instructional model. The study indicated that the intervention groups had much greater understanding of the information covered especially on questions that required interpretation.

As regard to evaluation of IBL students' for their learning approach the result of the current study showed that more than two thirds of the studied students reported that IBL approach enhance their problem solving and clinical decision making skills. These results may be due to that the students were actively involved in learning new methods and concepts to solve the problems, so they become motivated to seek knowledge leading to better comprehension and long term memory. Moreover the students of intervention group learn to work as a team and communicate with one another; consequently they develop listening, critical thinking and teaching skills. IBL helps the students to reflect their experiences, knowledge and apply these to the new situation. This study finding is supported by Snow Sarah and Torney Laura [26] who conducted a descriptive study to evaluate first year students' perceptions and experiences of an enquiry-based learning midwifery curriculum and reported that students were most likely to perceive the benefits of IBL as increasing critical thinking (73%), problem-solving (68%) and leadership skills (66%).

Furthermore, the result of the current study revealed that nearly two thirds and more than half of the students on the control group reported that weakness of conventional method are passive role of learner and limited time for questions or discussion. This finding is supported with Price and Almpanis [27] who noted that 79% of student respondents at Southampton Solent University said the provision of lecture capture would not encourage them to skip class. Similarly, Williams, Pfeifer and Walker [28] found that about four-fifths of their respondents indicated that they tried to attend all lectures and used lecture capture only to make up for missed lectures or for revision. Data indicated that students don't pay attention in didactic lectures for more than 10-20 min. This because of their passive role and absence of students' interaction which result in poor feeling. Therefore, each day teachers observe students side conversation, sleeping and even texting during their lecture time [29].

Concerning students' recommendation for their learning approach nearly two thirds of the studied students on the control group recommend integration between lecture and other interactive method of learning. This finding is in the same line with Peyman Hafezimoghadam *et al.* [30] who conducted a study to compare lecture and small-group discussion methods for educating medical students in emergency department and sated that medical students learning about basic life

support and advanced cardiovascular life support preferred a combination of lecture and small-group discussions over traditional lectures or discussion groups.

CONCLUSIONS

The results of this study concluded that inquiry-based learning has positive effect on maternity nursing students' satisfaction, motivation and achievement than conventional teaching method. Student's theoretical achievements of antenatal unit were higher scores among study group used inquiry based learning than control group used conventional learning. Furthermore, students' satisfaction and motivation was higher among IBL group than conventional learning with statistical significant difference.

Recommendation: In the light of the study findings, the researchers recommended that:

• Application of inquiry based learning approach in different nursing branches.
• Integration between conventional learning and other interactive learning approach in all nursing curricula.
• Further research still needed to evaluate the effect of inquiry based learning approach on student's practical achievements.

REFERENCES

1. Aditomo, A., M. Goodyear, P. Bliuc and R. Ellis, 2013. Inquiry-Based Learning in Higher Education: Principal Forms, Educational Objectives and Disciplinary Variations.Studies in Higher Education, 38(9): 1239-1258.

2. Mahmoud A. Kaddoura, 2011. Critical Thinking Skills of Nursing Students in Lecture-Based Teaching and Case-Based Learning. International Journal for the Scholarship of Teaching and Learning. 5(2): 1-18.

3. Ann E. Nielson, Joanne Noone, Heather Voss and Launa Rae Mathews,2013.Preparing nursing students for the future: An innovative approach to clinical education. Nurse Education in Practice. 13(4): 301-9.

4. Shin, H., S. Sok, K.S. Hyun and M.J. Kim, 2015. Competency and an active learning program in undergraduate nursing education. J. Adv. Nurs., 71(3): 591-598.

5. Jacinta Secomb, Lisa McKenna and Colleen Smith, 2012. The effectiveness of simulation activities on the cognitive abilities of undergraduate third year nursing students: a randomize control trial. Journal of Clinical Nursing, 21: 3475-3484.

6. Pedaste, M., M. Maeots, L.A. Siiman, Ton de Jong, Siswa A.N. Van Riesen, T.E. Kamp, C.M. Constantinos, C.Z. Zacharias and E. Tsourlidaki, 2015. phases of inquiry based learning: Definitions and the inquiry cycle. Educational Research Review. 14: 47-61.

7. Carl J. Wenning, 2010. Levels of inquiry: Using inquiry spectrum learning sequences to teach science. J. Phys. Tchr. Educ., 5(3): 11-20.

8. Ali Abdi, 2014. The Effect of Inquiry-based Learning Method on Students' Academic Achievement in Science Course. Universal Journal of Educational Research, 2(1): 37-41.

9. Margus Pedaste, Mario Maeots, Leo A. Siiman, Ton de Jong, Siswa A. N. van Riesen, Ellen T. Kamp, Constantinos C. Manoli, Zacharia and Eleftheria Tsourlidaki,2015.Phases of inqiry based learning: definitions and the inquiry cycle. Educational Research Review. 14: 47-61.

10. Patamaporn Thaiposri and Panita Wannapiroon, 2015. Enhancing students' critical thinking skills through teaching and learning by inqiry based learning activities using sociial network and cloud computing. Procedia Social ans behavioral sciences. 174: 2137-2144.

11. Kusurkar, R., T. Ten Cate, C. Vos, P. Westers and G. Croiset, 2011. How motivation affects academic performance: a structural equation modeling analysis. Advances in Health Science Education. 18: 57-63.

12. Eva Marie Kane, 2013. Urban Student Motivation through Inquiry-Based Learning. Journal of Studies in Education. 3(1): 155-168.

13. Afzal, H., I. Ali, M. Khan and K. Hamid, 2010. A Study of university students' motivation and its relationship with their academic performance. International Journal of Business and Management, 5(4): 80-88.

14. Aktaº, Y.Y. and N. Karabulut, 2016. A Survey on Turkish nursing students' perception of clinical learning environment and its association with academic motivation and clinical decision making. Nurse Education Today. 36: 124-8.

15. Mari Lahti, Heli Hatonen and Maritta Valimaki, 2014. Impact of e-learning on nurses' and student nurses knwoledge, skills and satisfaction: A systematic review and meta-analysis. International Journal of Nursing Stdeies. 51: 136-149.

16. Derek Chambers andrea Thiekötter and Lara Chambers, 2013. Preparing student nurses for contemporary practice: The case for discovery learning Journal of Nursing Education and Practice, 3(9): 106-113.

17. Levett-Jones, T., M. McCoy, S. Lapkin, D. Noble, K. Hoffman, J. Dempsey, C. Arthur and J. Roche, 2011. The development and psychometric testing of the satisfaction with simulation experience scale. Nurse Educ. Today, 31: 705-710.

18. Perrot, L.J., L.A. Deloney, J.K. Hastings, S. Savell and M. Savidge, 2001. Measuring students' motivation in health profession's colleges. Adv. Health Sci. Edu., 6(3): 193-203.

19. Powell-Moman, A.D. and V.B. Brown-Schild, 2011. The Influence of a Two-Year Professional Development Institute on Teacher Self-Efficacy and Use of Inquiry-Based Instruction. Science Educator, 20(2): 47-53.

20. Gwo Jen Hwang, Li-Yu Chiu and Chih-Hung Chen, 2015. A contextual game-based learning approach to improving students' inquiry-based learning performance in social studies courses. Computers and Education, 81: 13-25.

21. Jose Luis Zafra-Gomez, Isabel Roman-Martinez and Maria Elene Gomez-Miranda,2015. Measuring the impact of inquiry based learning on outcomes and students' satisfaction. Assessment and Evaluation on Higher Education, 40(8): 13-22.

22. Gamze Sarýkoc and Emine Oksuz, 2017. Effýcacy Academic Motivations and Academic Self-Efficacy of Nursing Students. J. Clin. Anal. Med., 8(1): 47-51.

23. Lee, I.C. and K. Yuan, 2010. the effect of learning motivation, total quality teaching and peer-assisted learning on study achievement: Empirical analysis from vocational universities or colleges' students in Taiwan. Journal of Human Resources and Adult Learning. 6(2): 56-73.

24. Zeki Bayram, Ozge Ozyalcin Oskay, Emine Erdem, Sinem Dincol Ozgur and Senol Sen, 2013. Effect of inquiry based learning method on students' motivation. Procedia-social and Behavioral Sciences. 106: 988-996.

25. Gwo Jen Hwang, Po Han Wu, Ya Yen Zhuang and Yueh Min Huang, 2013. Effects of the inquiry-based mobile learning model on the cognitive load and learning achievement of students. Interactive Learning Environment, 21(4): 212-219.

26. Snow Sarah and Torney Laura, 2015. An evaluation of the first year of an Enquiry based learning midwifery curriculum. British Journal of Midwifery. 23(12): 894-900.

27. Price, D. and T. Almpanis, 2015. Student and staff perceptions on the impact of lecture capture. In the Proceedings of the International Conference on Information Communication Technologies in Education, Kos, Greece. pp: 215-225.

28. Williams, B., J. Pfeifer and V. Walker, 2013. Lecture Capture: Student Hopes, Instructor Fears. Australasian Journal of Educational Technology, 28(2): 199-213.

29. Maureen Kroning, 2104. Importance of integrating active learning in education. Nurse Education in Practice. 14: 447-448.

30. Peyman Hafezimoghadam, Sahar Farahmand, Davood Farsi, Mohammadamin Zare and Saeed Abbasi, 2013. A Comparative Study of Lecture and Discussion Methods in the Education of Basic Life Support and Advanced Cardiovascular Life Support for Medical Students. Tr. J. Emerg. Med., 13(2): 59-63.