Effect of Lecture versus Jigsaw Teaching Strategies on Maternity Nursing Students' Attitudes and Academic Achievement

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Abstract

Jigsaw learning is a cooperative learning strategy in which maternity nursing students participate actively in the teaching-learning process. It also allows students to interact and participate in maternity nursing courses. **Aim:** The study aimed to assess the effect of lecture versus jigsaw teaching strategies on maternity nursing students' attitudes and academic achievement. **Research design:** A quasi-experimental study design was used. **Research setting:** The study was conducted at the Technical Institute of Nursing, Kafer El-Sheikh Governorate, Egypt, during the course entitled "Maternity Nursing." **Sampling:** A convenience sample of nursing students in the 3rd level and 2nd years was recruited. Number = 160 were categorized into two groups: control group (80) "lecture group" and study group (80) "jigsaw group". **Tools**: The data was gathered using four tools: 1. self-administered questionnaire, 2. student's knowledge assessment tool (pre-posttest), 3. Likert attitude scale to assess the students' attitude toward the teaching strategy, 4. Students' Opinion Sheet. **Results:** There was a significant difference between both groups regarding the students' achievement (post and follow-up written exams). The students' theoretical achievement in maternity nursing lectures was higher in the study groups than in the control group on the post and follow-up exams. Students in the study group exhibited a more positive attitude concerning the teaching strategy than the students who were in the control group. **Conclusion:** The jigsaw learning strategy is effective in improving the attitudes and achievements of maternity nursing students during the course. **Recommendations**; apply the jigsaw learning strategy as a method of teaching in all nursing academic courses.

Keywords: Jigsaw Strategy, Academic Achievement, Maternity Students' Attitudes.

Introduction

The Evidence-Based Maternity Nursing Practice (EBMNP) process involves the formulation of structured questions by healthcare staff. In addition, for its reliability and validity, they must then critically evaluate the research for its relevance and applicability in a clinical setting (**Horntvedt, et al., 2018**).

Traditional educational methods teach nursing students a certain amount of knowledge linked to many specialties but do not provide them with the resources to enhance graduate nurses' analytical thinking or be able to interpret, evaluate, and coordinate new information needed for successful learning. It is of great importance that the responsibilities of universities change, particularly in medical and paramedical faculties and they develop their thinking and inference skills instead of just learning and memorizing **(Chen, et al., 2013).**

In addition to promoting nursing students towards professional competence so, that they can explore knowledge in their field of problem-solving, nursing education needs to improve problem-solving. A primary objective of nursing education and health education for mothers is the application of acquired knowledge from educational environments to clinical environments and society toward desired health outcomes **(Abd El Aliem, et al., 2019).** Student-centered learning means that, with their learning, students have more responsibility and are more interested in educational processes **(Rivaz et al., 2015).**

The jigsaw method is a cooperative and collaborative learning strategy ***(Jamal, 2015)*.** It is one of the integrated learning strategies that enable students to interact, plan for themselves, participate in their course materials, lead and present among their peer groups, and encourage each other to learn. The method is done with the aid of the teachers and accomplished under their supervision, helping to activate students' learning characteristics by involving them directly **(Cağatay& Demircioğlu, 2013).**

The jigsaw methods of learning consist of five essential factors: positive autonomy, interaction promotion, individual responsibility, interpersonal and social skills teaching, and group processing quality. Nursing students' academic, social, affective, and psychological development working together in groups has been established. Higher-level reasoning, critical thinking skills, problem-solving, lower levels of anxiety and stress; improved essential motivation to learn and achieve more positive attitudes towards the subject; and advanced self-esteem are the benefits of cooperative learning **(Fadilah & McKenna, 2018).**

Maternity nursing courses prepare midwife nursing students to work with mothers and their children in an intense working atmosphere. **(Fadilah & McKenna, 2018).** Due to active involvement in the learning process, Jigsaw has been shown to improve the long-term retention of acquired knowledge among learners as a learning technique. Furthermore, students' decision-making and problem-solving individually reinforced critical thinking skills **(Hammond, et al., 2019).** These requirements must also be met in maternity nursing to be able to achieve protection for mothers and newborns **(Jadhav & Jadhav, 2016).**

The significance of the study:

This research investigates the effectiveness of new learning technologies like the Jigsaw technique to provide maternity nursing students with the best learning opportunities. This prevents simplistic learning and contributes to the enhancement of critical thinking abilities, problem-solving, decision-making skills, and memory improvement for nursing students. Given the lack of Saudi studies that discussed the maternity specialty topic of the Jigsaw technique, this research was therefore conducted to evaluate the effect of lecture versus jigsaw teaching strategies on maternity nursing students' attitudes and academic achievement.

Aim of the Study

The study aimed to assess the effect of lecture versus jigsaw teaching strategies on maternity nursing students' attitudes and academic achievement.

Research hypothesis

Maternity nursing students who receive the Jigsaw learning strategy will enhance their attitude and academic achievement in maternity nursing courses more than those who receive lecture groups.

Subjects and Methods:

Research design

A quasi-experimental pre and post-test design were applied to achieve the current study aim.

Research setting

The study was carried out in the Technical Institute of Nursing, Kafer El-Sheikh Governorate, Egypt, during the course entitled "Maternity Nursing, collected data in the first and second semesters of the academic year 2017/2018.

Sampling

A convenience sample was recruited from 3rd level, 2nd year nursing students. Number = 160 were involved in the study and were classified into two groups based on the timing of the study. Students from the first semester of the academic year attended (2017-2018). The control group (80 students) was a fellow of the traditional teaching method in normal labor lectures, while the study group (80 students) was a fellow of the cooperative learning jigsaw approach for the second semester of the academic year (2017–2018). The study group is divided into eight heterogeneous subgroups, each group comprising ten students with different academic skills.

Tools for data collection: the data were collected using four tools after an extensive review of the relevant literature.

Tool I: A self-administered questionnaire

It was used to determine the students ' characteristics (age, marital status, and residence). It took 6 minutes for the students to complete it.

Tool II: Learning's Achievement questionnaire:

It included 35 questions concerning normal labor and delivery's theoretical component lectures to assess the different domains of learning objectives among both Jigsaw cooperative learning and the traditional method groups. It consists of two sections. The first section consists of 20 Multiple Choice Questions (MCQ) and 5 true or false questions about normal labor and childbirth, such as description and terminology, labor signs and symptoms, phases of labor, normal labor mechanism, and the various comfort-promotion and pain-relief methods used during labor and birth, as well as the ongoing assessment involved with each stage of labor and birth. The second section consisted of 7 multiple-choice questions and 3 true or false questions about normal labour nursing care and management. The students took 40 minutes to complete their responses.

Procedure

Scoring system:

According to the operational scoring system in the academic environment in Saudi Arabia, the student's performance on the exam was scored as follows.

- (A+) Excellent: 95 to 100 = 5.0
- (A) Excellent = 90 to ≤ 95 = 4.75
- (B+) Very Good =85 to < 90 = 4.5
- (B) Very Good= 80 to <85 = 4.0
- (C+) Good=75 to <80 = 3.5
- (C) Good =70 to <75 = 3.0
- (D+) Pass =65 to <70 = 2.5
- (D) Pass=60 to <65 = 2.0
- (F) Fail=<60 = 1.0

Tool III: Likert Attitude Scale for Maternity Nursing Students: it was adapted from (Leyva – Moral&Camps, 2016), (Bhandari, et al., 2017). The researcher changed it to assess the attitude of nursing students specializing in maternity towards both teaching methods and learning strategies. This involves three levels of response: disagree, uncertain, and agree. There are eighteen statements on the scale. It took eight minutes for students to fill them up.

Scoring system:

The students' attitude to the currently used teaching methods was based on 3 Likert scale topics: uncertain = (0), disagree = (1), and agree = (2). The total score ranged from 0 to 36, and the overall grade for the attitude of the students was classified as follows:

- **Negative** Attitude < 70% (0-24)
- **Positive** Attitude from 70 %- 100% (25-36)

Tool IV: Cooperative Jigsaw Opinion Sheet for Students

The researcher developed it based on related literature, **(Bhandari, et al., 2017), (Abdullah& ABiyikli, 2017), (Aronson, 2019)** to evaluate students' opinions related to the strategy of the jigsaw as a learning technique among the study group. It contains eight statements with two responses: "agree" and "disagree." As well as supportive material for the study group (a handout) that designates the strategy of the jigsaw as a teaching method, comprising "the definition of jigsaw strategy, goals, advantages, and with the following stages:

- **1st Stage:** Students were distributed into groups. These were called the "Jigsaw groups".
- **2nd Stage:** Assign one student from each group as the leader; this person should be the most mature student in the group. Their role is to simplify and exchange group discussions.
- **3rd stage:** The scientific content is divided into subtopics. A different subtopic was assigned to each student in the Jigsaw groups. Provide students with the materials and resources they need to learn about their subjects.
- **4th stage, the** students who were allocated the same sub-topics in all the Jigsaw groups were composed to form "expert groups."
- **5th stage**: The expert groups have been given the chance to gain knowledge through reading, research, and discussion.
- **6th stage:** Students in this expert group discuss the main topics of their subtopic and practice the presentation they are going to make to their jigsaw group. The instructor moved between groups and encouraged the whole technique.

- **7th** stage: Students return to their jigsaw groups.
- **8th stage:** Students presented their subtopic to their jigsaw group; other members were excited to ask for an explanation. The teacher moved between groups and simplified the whole method.
- **9th stage:** Lately, one member of each "jigsaw group" was randomly selected and asked to present a particular topic to the whole class.

Validity and reliability

The contents and face validity of these tools were tested by a jury of five experts in the fields of obstetrical and gynecological nursing and nursing education. Modifications were made in response to the comments, which included "adding assessment of the practical part of nursing care during stages of labor through some pre and post-test questions." Cranach's alpha coefficient test revealed r = 0.86 in terms of reliability.

Ethical Consideration

An official letter was taken from the Nursing Department and scientific committee and the dean of the Technical Nursing Institute, Kafer El-Sheikh Governorate, to take the permission from Education and Training Administration to collect data. Informed consent was obtained after an explanation of the purpose of the study. Those who decided to participate in the study were confident of their privacy and withdraw at any time.

Pilot study

A pilot study was performed to assess the efficacy and content validity of the tool on 10% of the total sample size (16 students). Students participating in the pilot study were not included in the study.

Field Work:

The researcher first explained the study's purpose to the participants, assuring them that the information gathered would be kept private and used only for that purpose. The study lasted two semesters, from 2017 to 2018, and it was carried out in the educational class of the Nursing Institute. The study was performed in three subsequent phases: preparatory (assessment and planning), implementation, and assessment.

a-Preparatory phase (assessment and planning):

It began by preparing all the details on the strategy of Jigsaw learning; definition, the main objective, an overview of the method, Jigsaw in ten easy steps, and implementation tips. Also, the researcher identified goals for the study topic related to the lectures on normal labor and delivery. The scientific content was prepared by the researcher as a handout of lectures for normal labor and delivery. In this step, the researcher developed the assessment tools.

1. The researcher explained the aim of the study to the students in both groups.
2. First, through a self-administered questionnaire, students evaluated their characteristics in the classroom (tool 1).
3. Using the pre-test, the level of information for students about normal labor lectures was evaluated. (Tool II).
4. Both groups of students were evaluated post-test (immediate post-intervention) and follow-up (after four weeks of intervention) periods.

b-Implementation phase:

b.1. For the traditional group:

In four teaching sessions, each lasting two hours, the researcher provided scientific content in the structure of a "traditional" lecture or control group. For two days, with two sessions per day, for two weeks according to the pre-designed schedule of the maternity nursing timetable course.

b.2. For the Jigsaw strategy group: the study group implementation phase included four teaching sessions over three weeks.

Session 1: (Orientation Session)

- The study group attended a jigsaw cooperative learning strategy orientation session as a teaching method.

- The researcher then divided the students into eight groups, each with ten students in it. These were the "jigsaw strategy groups."
- A student team leader for each group was assigned. Their role was to facilitate group discussions and to share.
- The study subject (normal labor and delivery) was divided into 10 different subtopics, including "terminology and definition of normal labor, normal labor criteria, factors triggering the onset of labor, factors affecting the progress of labor, first stage and its phases, second stage physiology, mechanism of labor, third Stage physiology, fourth stage and management and nursing intervention for stages of labor.
- One sub-topic was given to each participant in the jigsaw group. Each student received a subtopic card, as well as a few leading questions to assist them in their learning.
- Subsequently, in all eight jigsaw groups, the students who were provided with the same sub-topics gathered to form "expert groups." In the next session, after one week, the students were asked to prepare the subtopics for discussion in their expert group according to the following forms of jigsaw groups and groups of experts:

Expert Groups	Jigsaw strategy groups									T0PIC
		(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	
	G1	A1	B1	C1	D1	E1	F 1	G1	H1	1-Definition of normal labor & delivery.
	G2	A2	B2	C2	D2	E2	F 2	G2	H2	2-Normal labor criteria
	G3	A3	B3	C3	D3	E3	F3	G3	H3	3-Factors affecting the progress of labor.
	G4	A4	B4	C4	D4	E4	F4	G4	H4	4-First Stage and its phases
	G5	A5	B5	C5	D5	E5	F5	G5	H5	5-Second stage physiology.
	G6	A6	B6	C6	D6	E6	F6	G6	H6	6-Labor Mechanism.
	G7	A7	B7	C7	D7	E7	F7	G7	H7	7-Third Stage physiology.
	G8	A8	B8	C8	D8	E8	F8	G8	H8	8-Fourth stage and Management
	G9	A9	B9	C9	D9	E9	F9	G9	H9	9-Nursing care plan
	G10	A10	B10	C10	D10	E10	F10	G10	H10	10-Health education and nursing management.

- The researcher gave the study group the same handout about normal labor and delivery lectures that were given to the control group. The researcher also suggested resources to direct the students and help them in planning their topics (recent textbooks, academic papers, websites, etc.).
- The groups were instructed to prepare the subject well, read it well, and then distribute additional reading within a week.
- The researcher confirmed that all the students 'information on the subtopics prepared was accurate and could be corrected before the students started their discussion in front of their groups and clarified their doubts.

Session 2: (Expert Groups' Discussion)

Over the next week, the expert group worked together for two hours, discussing their subjects. Every student shared their acquired knowledge of their subjects. The others noted additional points and the researcher (teacher) clarified their doubts if any.

Session 3: (Jigsaw Groups' Discussion)

• To present their sub-topic to others, the students returned to their jigsaw group again. It took 2 hours for this session so that each student could present his subtopic. Finally, they discussed topics together to enhance their thinking skills, cooperation, interaction, and active learning. The researcher floated and facilitated the entire process between groups.

Session 4:

• During the third week, the last session lasted 4 hours, in which one participant from each Jigsaw group was randomly appointed and asked to teach a specific topic to the entire class. It was permissible for the learner to use chalk and aboard. Since it was possible to discuss all subjects. If students had any questions, they were encouraged to ask the presenter, and the researcher explained their doubts about the students.

- Finally, the Opinion Sheet of Students (tool IV) was distributed to evaluate the opinions of students related to the jigsaw strategy as an education technique.

Evaluation phase:

- In both groups, all students were evaluated using the tool (II) for their achievements regarding the theoretical part of normal labor lectures through pre, post, and follow-up exams.
- An evaluation of the attitude of the students regarding the teaching strategy used between both groups was carried out using tool III.
- A comparison was made between the study group and the control group to examine the effectiveness of two teaching strategies to explore the research hypothesis.

Statistical analysis

The data was collected, analyzed, and tabulated after being reviewed and prepared for computer entry. Version 23 of the Statistical Package for Social Science (SPSS). The data were presented using descriptive statistics in the form of frequencies and percentages for qualitative variables and means for quantitative variables, as well as chi-squared to determine the relationship between qualitative data. The significance test was used to determine the relationship between qualitative data. Ascertain if there was a statistically significant difference between the jigsaw strategy and the lecture groups. When (P-value=0.05) was used, statistical significance was considered, and high significance when (P-value = .001) was used. When the P-value was greater than 0.05, the difference was considered not statistically significant; when the (P-value>0.001), the difference was considered not highly significant.

Results

Table (1): demonstrates that, the mean age of the jigsaw and lecture groups was 20.8 ± 0.74 and 20.7 ± 0.81 respectively. There was no statistical significance between the two groups regarding their demographic data, where (P-value > 0. 05).

Table (2): illustrates that, there was no statistically significant difference between the jigsaw and the lecture groups before the intervention regarding their pre-intervention level of learning achievement, while a statistically significant difference between the groups was observed immediately after the intervention, as the (p-value=0.04). In addition, a high statistically significant difference between both groups, with (p-value = 0.001), was detected in the follow-up period (4 weeks after intervention).

Figure (1): shows that, 70.20% of the lecture group, compared to 80.30% of the Jigsaw Group, had a positive attitude towards the Jigsaw learning strategy. However, there was a statistically significant difference between the two groups (P value=0.001).

Table (3): represents students' opinions regarding the strategy of the jigsaw teaching method. They reported that this method enhanced teamwork, communication skills, and confidence (97.50% & 93%) respectively, overall pleased with this teaching method (90%), and enriched retention of knowledge (95%).

Figure (2): demonstrates a statistically significant positive correlation between students' knowledge and their attitude post jigsaw intervention. As students' knowledge increased, their positive attitude was enhanced, where (P value< 0.001).

Table (4): describes that, the total means achievement scores were (76.1± 1.02 & 64.5± 1.81) in the jigsaw and the lecture group, respectively. A statistically significant difference between the two groups has been observed, where (P-value =0.000).

Table (5): indicates that, there was a high statistically significant positive correlation between the total achievement scores of the jigsaw learning group and their overall attitude, as well as an opinion on the cooperative jigsaw method as a method of learning before, immediately after, and following the intervention strategy (P-value=0.000).

Table (1): Socio-demographic data for the studied groups (n = 160).

Socio-demographic data		Jigsaw group n=(80)		Lecture group n= (80)		X^2 (P)
		No	%	No	%	
Age in years (Mean±SD		20.8 ± 0.74		20.7 ± 0.81		χ^2=1.32 P = 1.30
Marital Status	Single	77	96.3	78	91.7	χ^2=1.32 P = 1.30
	Married	3	3.7	2	8.3	
Residence	Inside Hafr Al-Batin	45	56.25	50	62.50	χ^2=2.61 P = 0.022
	Outside Hafr Al-Batin	35	43.75	30	37.50	

Table (2): Comparison of their learning performance before, immediately after, and follow-up period intervention between the studied groups (n=160).

Achievement Levels for learning		Jigsaw group (n=80)		Lecture group (n=80)		X^2 (P)
		No	%	No	%	
Before intervention						χ^2=8.61 P = 0.022
	Good	8	10.00	7	8.75	
	Pass	24	30.00	26	32.50	
	Fail	48	60.00	47	58.75	
Immediate after Intervention	Excellent	20	25.00	17	21.25	χ^2=15.11 P = 0.04*
	Very Good	28	35.00	22	27.50	
	Good	16	20.00	12	15.00	
	Pass	13	16.25	24	30.00	
	Fail	3	3.75	5	6.25	
Follow Up (4 weeks after intervention)	Excellent	23	28.75	18	22.50	χ^2=13.50 P = 0.001*
	Very Good	37	46.25	20	25.00	
	Good	15	18.75	10	12.50	
	Pass	5	6.25	25	31.25	
	Fail	4	5	7	8.75	

***Statistically significant difference.**

Figure (1): Total attitude score towards used teaching methods between control and study group.

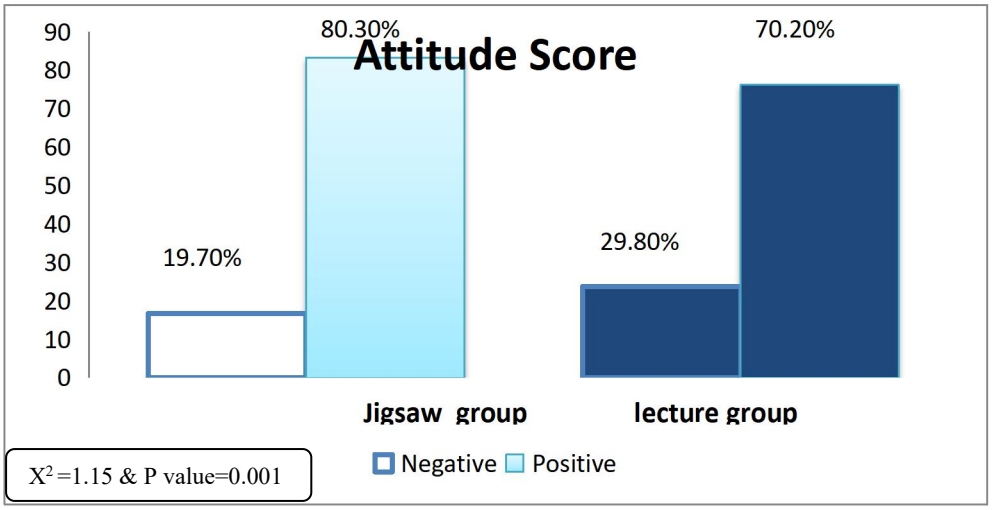

Table (3): The opinion of students around the jigsaw learning strategy group: n = 80.

Students' opinions	Jigsaw group N=80	
1-It improved communication skillfulness & self-confidence	75	93.00%
2-It improved teamwork	78	97.50%
3-It helps in the understanding of the course content	77	96.25%
4-It enriched retention of knowledge	76	95.00%
5-It improved problem-solving skills	70	87.50%
6-It improved critical thinking & decision-making skills	71	88.75%
7-It improved to advance information management skills	73	91.25%
8-It simplified applying information into clinical practice	69	86.25%
9-It was an effective method of learning and comprehending	74	92.50%
10-It was an Innovative teaching-learning technique	70	87.50%
11-Overall I am pleased with this teaching method.	72	90.00%
12-Application of jigsaw learning method in other nursing courses (theory & practice) as a teaching technique	71	88.75%

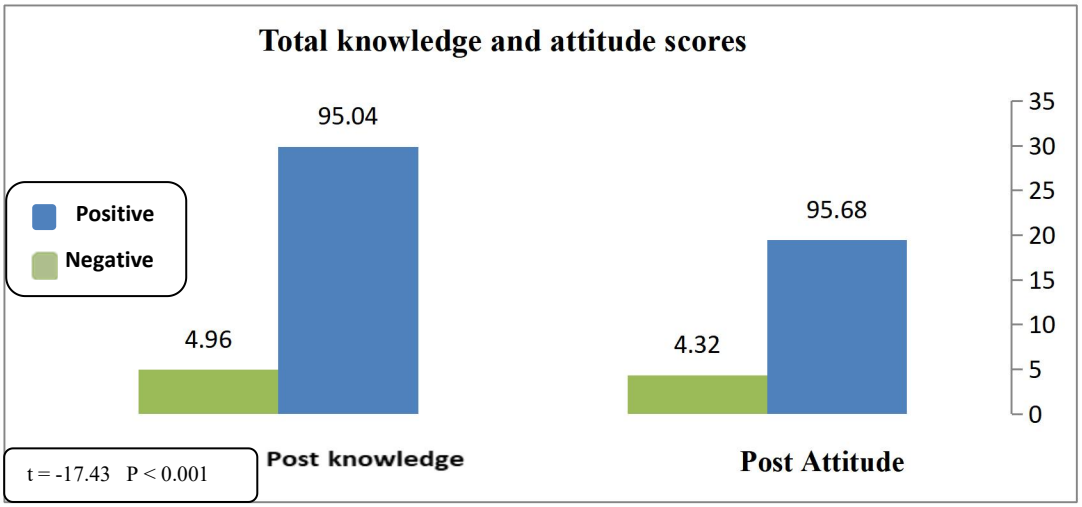

Figure (2): Total knowledge and attitude scores in the "jigsaw group" study group immediately after intervention (n=160).

Table (4): Association of the mean total achievement scores in both groups before, immediately after, and follow-up intervention (n=160).

total achievement` scores	jigsaw group (n=80) Mean ± SD	Lecture group (n=80) Mean ± SD	P-value Independent test
Before intervention	21.5± 0.47	20.4± .09	0.184
Immediately after Intervention	25.5± 0.32	21.6± 0.91	0.000*
Follow Up	29.1± 0.23	22.5± 0.72	0.183
Total achievement` scores	76.1± 1.02	64.5± 1.81	0.000*

****High statistically significant difference P≤0.001.**

Table (5): The correlation between total achievement scores, total attitude, and cooperative jigsaw opinions at different times of assessment among the jigsaw learning group (n = 80).

Items	Time	Total attitude scores		jigsaw strategy opinion`s Total scores	
		r	p-value	r	p-value
Total achievements scores	Before intervention	0.527	0.000**	0.641	0.000**
	Immediately after intervention	0.456	0.000**	0.502	0.000**
	Follow up	0.78	0.000**	0.82	0.000**

*****A high statistically significant difference (P≤0.001).***

Discussion

An important way to enhance and develop education in nursing is to determine the consequences of teaching techniques on the achievements of nursing students and the effectiveness of teaching at nursing institutes or collages. Additionally, the quality of teaching effectiveness has been enhanced over time and is considered core to providing a high quality of care **(Melinamani, et al., 2017).** In modern educational systems, a cooperative learning strategy jigsaw will help nursing students develop their academic achievement, critical thinking skills, problem-solving abilities, and decision-making abilities, which will reflect in clinical practice to provide high-quality maternity care **(Swathi & Rajkumar, 2017).**

The results of the current study revealed that, there was no statistically significant difference in the degree of learning achievement before intervention between jigsaw and lecture classes, although a statistically significant difference was observed between classes immediately after the intervention. A high statistically significant difference between both groups was observed during follow-up (four weeks after intervention). In contrast, nearly three-quarters of the lecture group and most of the Jigsaw group had a constructive outlook toward conventional approaches concerning Jigsaw learning. Also, the current work showed that, there was a highly statistically positive correlation between the total achievement scores of the jigsaw learning group and their overall attitude, as well as an opinion on the cooperative jigsaw process as a learning technique before, directly after, and after the intervention.

This suggests that the jigsaw strategy might be an effective approach in comparison to a traditional lecture-based method for educating nursing students in terms of improving students' achievement, and this could be described by the fact that exposure to learning through the traditional teaching technique leads to concrete, dualistic thinking, and surface learning, while the jigsaw strategy is an active technique of transforming nursing students from passive to active learners.

The current finding was similar to the study of **(Abd El Aliem, et al., 2019).** They discovered that there was no statistical significant difference between the jigsaw strategy group and the lecture groups before the intervention, but there was a statistical difference between both groups immediately after the intervention. In addition, at the follow-up, there was a statistically significant difference between the two groups (4 weeks after the intervention).

In addition, this was in agreement with the results of **(Kritpracha, et al., 2018)** who found that after the jigsaw, the learning achievement ratings were significantly higher than before the jigsaw. Also, this was consistent with the study of **(Tekdal& Sonmez, 2018).** Who observed that there was a significant difference in the retention test between the experimental (Jigsaw) and the control (traditional) groups (done 3 weeks after application) and the average scores in the experimental group, which shows the jigsaw method's beneficial effect on information retention. This may be due to jigsaw learning methods being considered new and different to nursing students, especially when used in lectures, which makes them more elaborate and excited.

Furthermore, the current finding was supported by the findings of **(Ahmed & Mostafa, 2018).** They reported that there was no statistically significant difference between the control and study groups regarding their theoretical achievement pre-intervention and there was a statistically significant difference in the post and follow-up tests of both groups. However, the excellent grade was higher among the study group in the follow-up exam as compared to the control group.

Moreover, in the study of **(Abdullah & Biyikli, 2017).** Who reported that the average scores of control pre-test and experiment groups are almost the same with no statistical significant difference between the scores of the two groups and there was a significant difference in the post-test scoring between the two groups.

Also, this was in agreement with the study of **(Wilson, et al., 2017).** The study revealed that, there was a statistical significant

difference between pre and post-test intervention. Most of the students in maternity nursing had a good level of knowledge score post-intervention (jigsaw technique) as compared to pre-intervention. Also, students found the method beneficial in assisting them to learn better.

In addition, this was concordant with **(Jadhav & Jadhav, 2016).** This study revealed that the nursing students' attention is more focused on using jigsaw cooperative learning, and they can express the ideas they had in mind. For shy students, using cooperative learning jigsaw will automatically respond to all assigned tasks, so they can express their opinions more actively and they can also listen to the opinions of their friends and react immediately. Also, students' confidence will show up, and they can also appreciate other opinions. So, using cooperative learning jigsaw does not just advance academic achievement but also self-confidence, listening skills, and respect for other people's opinions.

Moreover, the current results were supported by the study **(Karimi & Bagheri,2017),** where they found that cooperative methods can be applied at different educational levels and in different disciplines (Medicine, Nursing, Dentistry, Rehabilitation, Midwifery, Pharmacy, and Education). This cooperative technique is recommended to teachers in different courses to advance various features of students' intelligence, such as critical thinking, problem-solving, theoretical, and practical achievement, self-esteem, self-confidence, and importance for learning.

Furthermore, the study of **(Gabr, 2017),** stated that cooperative education as a technique and attitude among nursing students is an effective method to foster a deeper attitude to learning, and improve the communication skills of nursing students, especially in cognitive skills, teamwork, and leadership abilities. Hence, it is recommended for the successful presentation of cooperative learning methods in nursing education, and it is supposed to improve academic achievement and professional performance.

Concerning students' attitudes toward the teaching approach, the current study showed that most of the study group had a better attitude toward the Jigsaw strategy than the students in the control group toward the method in traditional teaching. On the other hand, the majority of them suggested using the jigsaw strategy as a teaching tool in other nursing courses' theory and practice. Because of its innovative and teamwork focus, the jigsaw method was thought to motivate students to develop positive attitudes and abilities as well as knowledge, lower stress levels, and increase self-confidence and satisfaction.

This was supported by the study conducted by (**Bhandari, et al., 2017).** This study found that, the Jigsaw method is a healthy way to interact with peers, making learning interesting and effective. It also enabled them to comprehend better and enhance their communication skills. They were satisfied and had a positive attitude through this teaching-learning innovation. Also, the students recommended that the jigsaw strategy be incorporated into all topics in their curriculums. In addition, this was the agreement with the results of (Koohestani & Baghcheghi, 2016), who noticed that team-based learning had a positive effect on nursing students' perceptions of their psychosocial environment in the classroom.

But the study of **(Leyva – Moral&Camps, 2016),** which evaluated nursing student satisfaction with the technique of the jigsaw in the context of a required course in nursing research methods, illustrated that student satisfaction was low. This may be due to most of the students in this study believe that this course should not be used in the future.

Conclusion

The strategy of Jigsaw is one of the creative educational methods that have valuable consequences for teaching, learning, and nursing education research. It has a positive effect on Maternity Nursing's attitude and performance, as the theoretical achievement of normal labor and delivery lectures by students was higher in the study group (jigsaw cooperative strategy) than in the post-and follow-up exam control group (traditional) with a statistically significant difference. In addition, students in the study group were more enthusiastic about teaching

using strategies (jigsaw method) than students in the lecture group.

Recommendation:

- Using the jigsaw method of learning in all nursing academic courses as a teaching technique (theory & practice).
- Nursing programs should use a wide range of innovative teaching techniques, such as the jigsaw strategy, to make learning more student-centered.
- It is critical for maternity nursing students' professional development and lifelong learning to encourage them to take a more in-depth approach to learning by using a more active and jigsaw strategy as a cooperative learning tool.
- More research is needed to identify the barriers to implementing the strategy of Jigsaw in nursing education, as well as to explore the impact of the strategy of Jigsaw learning on clinical outcomes.

References

Horntvedt, M., Nordsteien A., Fermann, T., &Severinsson, E., (2018): Strategies for teaching evidence-based practice in nursing education: a thematic literature review. BMC Medical Education volume 18, Article number: 172.

Chen, S., Liang, T, &Lee M, (2013): Effects of concept map teaching on student's critical thinking and approach to learning and studying. Journal of Nursing Education, 50(8): 466-469.

Abd El Aliem R, Sabry, S, &El-Deen H., (2019): Utilization of Jigsaw Cooperative Learning Strategy on Maternity Nursing Students' Attitude and Achievement. American Journal of Nursing Science. Vol. 8, No. 6, 2019, pp. 361-370. DOI: 10.11648/j.ajns.20190806.22.

Rivaz, M., Momennasab, M., &Shokollahi, P., (2015): Effect of collaborative testing on learning and retention of course content in nursing students, Journal of Advances in Medical Education & Professionalism, Adv Med Educ Prof. 3 (4):178-182.

Jamal., M (2015): The Effectiveness of Jigsaw Strategy on the Achievement and Learning Motivation of the 7th Primary Grade Students in the Islamic Education, 5(4),111-118.

Cağatay, G., &Demircioğlu, G. (2013): The effect of jigsaw-cooperative learning technique on students' understanding of basic organic chemistry concepts. International Journal of Educational Researchers, 4(2), 30-37.

Fadilah, N., &McKenna, L., (2018): New nurses and community maternal care education: A qualitative study, Elsevier Ltd. available at https:// doi. org/ 10. 1016/ j.nepr.2018.11.011.

Hammond L., Flook L., Harvey CH., Barron, B. & Osher D., (2019): implications for the educational practice of the science of learning and development, Journal Applied Developmental Science, ISSN: 1088-8691 (Print) 1532-480X (Online) Journal homepage: https:// www. And online. com/ loi/ hads20.

Jadhav, V. &Jadhav, N., (2016): using the jigsaw cooperative learning technique for nursing students: College of Nursing, Navi-Mumbai, India, International Journal of Nursing and Medical Investigation, 1 (2), 130-140.

Leyva-Moral, J& Camps M., (2016): Teaching research methods in nursing using Aaronson's jigsaw technique. A cross-sectional survey of student satisfaction. Nurse Education Today., 40:78-83. DOI: 10. 1016/ j. nedt. 2016. 02.017.

Bhandari, Mehta, Mavai, Singh, &Singhal., (2017): Jigsaw Method: Innovative Way of Cooperative Learning in Physiology, Indian J Physiol Pharmacol 2017; 61(3): 315–321.

Abdullah Aydin, &ABiyikli, F., (2017): The Effect of Jigsaw Technique on the Students' Laboratory Material

Recognition and Usage Skills in General Physics Laboratory-Course, Kastamonu University, Turkey, Universal Journal of Educational Research 5(7): 1073-1082.13.

Aronson E., (2019). The Jigsaw Classroom. Jigsaw In 10 Easy Steps. Social Psychology Network. Available at https://www.jigsaw.org/.Retraived on; 1/9/2019.

Melinamani., S, Francis.,F, George., R, Pushpa.,M, &Verghese., S., (2017): The Jigsaw effect: Impact of Jigsaw learning technique on nursing students to learn the concepts of normal labor, Asian J. Nursing Edu. and Research 7(2):1.

Swathi A, &Rajkumar., (2017): An interventional approach "Jigsaw method" in combination with a lecture to improve the understanding of Clinical Microbiology for second MBBS students.

Kritpracha C., Sae-Sia W., Nukaew O., Jittanoon P., Chunuan S., & Kaosaiyaporn O., (2018): The Development of Cooperative Learning Using Jigsaw Activities for Learning Achievement and Self-directed Learning Behaviors of Nursing Students, International Journal of Information and Education Technology, Vol. 8, No. 12, December 2018.17.

Tekdal m., &Sonmez s., (2018): The Effect of Using Jigsaw Cooperative Learning Technique in Teaching Computer Literacy on Students' Achievement and Retention, Cukurova Universitesi Eğitim Fakultesi Dergisi, 47 (1), 2018, 37-59, www.cufej.com .

Ahmed, A., & Mostafa, Sh. (2018): Effect of Jigsaw learning Strategy on Maternity Nursing Students' Attitude and Achievement, The 7th International Scientific Conference of Faculty of Nursing, Suez Canal University, In collaboration with Edith Cowen University, Australia, 21-22 November 2018, Academic Perspective In Nursing: Practice, Education And Research.

Wilson J., Pegram H., Battise D., &Robinson M., (2017): Traditional lecture versus jigsaw learning method for teaching medication therapy management (MTM) core elements, Currents in Pharmacy Teaching and Learning, vol. 9, pp. 1151-1159.

Jadhav V., &Jadhav, N., (2016): using the jigsaw cooperative learning technique for nursing students: College of Nursing, Navi-Mumbai, India, International Journal of Nursing and Medical Investigation, 1 (2), 130-140.

Karimi, H, &Bagheri, M, (2017): Jigsaw: A good student-centered method in Medical education, Volu7, Issue 1, Page 35-40.

Gabr, H., (2017): The Effect of Cooperative Learning Strategy on Undergraduate Nursing Students Enrolled in Nursing Administration Course Faculty of Nursing Mansoura University, Egypt 23-40 Vol. 7, No. 1.

Koohestani HR, &Baghcheghi N, (2016): The effects of team-based learning techniques on nursing students' perception of the psycho-social climate of the classroom, 30:437.4 .