Effect of Jigsaw Cooperative Learning Strategy on Academic Achievement among Maternity Nursing Students

[1]Eman Helal Elsayed Mahmoud Elbatawy, [2]Samia Abd El Hakem Hassanin Aboud and [3]Afaf Mohammed Emam

(1) Instructor at Benha Technical Nursing Institute and (2,3) Professor of Obstetrics and Gynecological Nursing, Faculty of Nursing, Benha University

Abstract

Background: The Jigsaw learning strategy is a way to learn the course material in a cooperative learning style. **Aim of the study:** Was to evaluate effect of Jigsaw cooperative learning strategy on academic achievement among maternity nursing students. **Setting:** The study was conducted at Benha technical health institute in Qalyubia governorate. **Research design:** A quasi-experimental study was utilized to conduct the study. **Sample:** A systematic random sample was used included 200 nursing students who selected and divided into two groups control and study groups. **Tools of data collection:** Three tools were used: **Tool I):** A structured self- administrated questionnaire: included general characteristics of the technical nursing institute students. **Tool II):** Learning Achievement Questionnaire regarding normal and abnormal puerperium. **Tool III):** Cooperative Jigsaw opinion scale. **Results:** The present study results revealed that, the mean score of maternity nursing students' achievement regarding normal and abnormal puerperium was statistically higher in the study group compared to control group at post and follow up phase of the Jigsaw learning strategy implementation ($P < 0.01$). Also, more than three quarters of the study group had satisfactory opinion regarding Jigsaw learning strategy. **Conclusion**: The Jigsaw learning strategy was significantly more effective in improving maternity nursing students' achievement. **Recommendations:** Developing a periodical awareness program for technical nursing institute students to enhance the students' learning achievement regarding normal and abnormal puerperium.

Keywords: Academic Achievement, Jigsaw Cooperative Learning Strategy.

Introduction:

Education plays an important role in shaping the character of students, including the values of cooperation and tolerance. These characters are very much needed in social life to create a harmonious and inclusive environment. However, in practice, there are still many students who are less able to work together in groups and have a low level of tolerance for differences of opinion and background of peers **(Cholifah, 2024).** One learning strategy that can be used to overcome this problem is the Jigsaw cooperative learning strategy, which emphasizes active interaction between students in the learning process **(Hasanah et al., 2025).**

The Jigsaw learning method, developed by Elliot Aronson in the 1970s, is a cooperative learning technique that emphasizes interdependence and shared responsibility. The core idea is to divide a learning task into smaller, manageable "pieces" that individual students become experts on. These experts then share their knowledge with their peers, creating a complete understanding of the topic, like assembling a jigsaw puzzle **(Ross, 2025).**

The Jigsaw learning technique can enhance various aspects of students' learning experiences through effective implementation which significantly boost students' academic achievement and knowledge retention,

satisfaction and self-confidence, communication skills, problem-solving skills and attitudes towards learning, motivation and sense of responsibility. It also offers more mobility compared with the traditional classroom environment, allowing students to move and actively participate in their learning process **(Ozkan and Uslusoy, 2024).**

Academic achievement refers to the extent to which a student attains their educational goals and objectives, typically measured through grades, test scores and overall performance in coursework. The academic achievement encompassing not only the acquisition of knowledge, but also the effective application of that knowledge in various contexts, including examinations and practical applications **(Ibeh and Okigbo, 2024).**

The postpartum period, defined as the period beginning immediately after the birth of the baby and extending up to six weeks (42 days), is a critical time for women, newborns, partners, parents, caregivers and families. Yet, during this period, the burden of maternal and neonatal mortality and morbidity remains unacceptably high and opportunities to increase maternal well-being and to support nurturing newborn care have not been fully utilized. Postnatal care services are a fundamental component of the continuum of maternal, newborn and child care, maternal and child health, including targets to reduce maternal mortality rates and end preventable deaths of newborns **(WHO, 2024).**

Nurses play an important role in obstetric care, providing essential support and expertise throughout the perinatal period, which includes pregnancy, childbirth and the postpartum phase. Their multifaceted responsibilities encompass comprehensive assessment, education, emotional support, and clinical interventions, all of which are critical for promoting positive maternal and neonatal outcomes **(Al-Saluli et al., 2024).**

Nursing education requires a significant combination and synthesis of theoretical knowledge and practical skills. During nursing education, it should be ensured that students interiorize knowledge, skills, attitudes, professional values and ethical standards related to nursing and make them a part of their behaviors **(Bilgiç et al., 2024).**

Significance of the Study

The traditional educational methods are still most popular and widely practiced in nursing education around the world as they are feasible to teach more content to a larger group of students in a short time but students receive knowledge passively and end up memorizing it. Students get limited opportunities to work together as a team and to take ownership of their learning. As a result, universities, particularly those in the medical and paramedical sectors, should implement modern teaching methods that foster critical thinking rather than memorization **(Haider et al., 2025).**

Active learning strategies have gained traction, fostering more profound understanding, problem-solving abilities and student collaboration. Among these strategies is the Jigsaw learning strategy. It is one of the most popular and commonly adopted models of cooperative learning; this method promotes active engagement, critical thinking, collaboration and a more profound comprehension of the subject matter **(Yadav et al., 2025).**

Considering the lack of Egyptian studies that addressed Jigsaw learning strategy in maternity specialty, this study was conducted to evaluate effect of Jigsaw cooperative learning strategy on academic achievement among maternity nursing students.

Aim of the Study:

The aim of this study research was to evaluate effect of Jigsaw cooperative learning strategy on academic achievement among maternity nursing students. This aim was achieved through:

1. Assessing maternity nursing students' level of achievement regarding normal and abnormal puerperium.
2. Planning and implementing the jigsaw cooperative learning strategy as a learning strategy for maternity nursing students related to the theoretical part of normal and abnormal puerperium.
3. Evaluating effect of Jigsaw cooperative learning strategy on academic achievement among maternity nursing students.

Study research hypotheses:

H_1. The maternity nursing students who would participate in Jigsaw cooperative learning strategy would have better learning achievement compared to their peers in the lecture group.

H_2. The maternity nursing students who would participate in Jigsaw cooperative learning strategy would have satisfied opinion.

Subjects and Method:

Study research design:

A quasi-experimental study design (two groups study & control) were utilized to achieve the aim of the study.

Setting:

The study was conducted at Benha technical health institute in Qalyubia governorate, Egypt.

Sampling:

Sample type: A systematic random sample was used.

Sample size: A total of 200 nursing students at second academic year 2023- 2024 of Benha technical health institute in Qalyubia governorate were included in the current study research. The sample size was calculated according to the following formula **(Yamane, 1967).**

$$n=\frac{N}{1+N*(e)^2}=200$$

Sample technique:

The total sample was divided into two equal groups, control (lecture) group (n=100 are the odd numbers of the students' list) who followed the traditional method of teaching and study (jigsaw) group (n=100 are the even numbers of the students' list) who utilized cooperative jigsaw learning strategy.

Tools of data collection:

Three tools were used for data collection:

Tool I A structured Self-administered Questionnaire:

To assess the general characteristics of maternity nursing students as (age, gender, marital status and residence) **(Alqersh et al., 2024)**

Tool II Learning Achievement Questionnaire:

It was designed by researchers after reviewing related literature **(Grace et al., 2023., Gomes-Ferreira and Olivas-Menayo, 2023)** to assess the students' knowledge achievement through different strategies of learning among both control and study at pre, immediately after and follow up (after one month of intervention). It consisted of 36 items in the form of MCQ questions about the theoretical content of normal and abnormal puerperium as the following:- (definition and physiological changes during puerperium (13), management of normal pueperium (1), postpartum hemorrhage (5), nursing management of postpartum hemorrhage (1), puerperal sepsis (5), nursing management of puerperal sepsis (1), breast engorgement (4), nursing management of breast engorgement (1), urinary tract infection (4) and nursing management of urinary tract infection(1).

Scoring system:

Each correct answer gave score (2) while incorrect answer gave score (1), the total achievement scores were rated according to the operational scoring system at the academic setting in Egypt range as the following:

1. Excellent: if score 85% -100% (61-72) grades.
2. Very good: if score 75% (54-61) grades.
3. Good: if score 65% (47-54) grades.
4. Pass: if score 60% (43-47) grades.
5. Poor: if score <60% (<43) grades.

Tool III Cooperative Jigsaw Opinion Scale (CJOS):

It was adopted from **Abd El Aliem et al. (2019)** to assess the opinions of the study group regarding the Jigsaw learning method at the end of the study. It included 14 statements as the following:- (Jigsaw technique made the course content easy to understand, Jigsaw technique ensured the correction of misinformation, Jigsaw technique made students learn better, Jigsaw technique increased the possibility of the teacher's interested in each student, the dependence of the students upon the teacher was lessened, Jigsaw technique enhanced communication skills and self-confidence, Jigsaw technique enhanced teamwork cooperation, everyone in the group shared responsibility, Jigsaw technique made the ideas within the group to be discussed more positively, Jigsaw technique improved critical thinking and decision-making skills, Jigsaw technique facilitated applying knowledge into clinical practice, Jigsaw technique was the innovative teaching learning method, overall, the student satisfied with Jigsaw teaching method, applying Jigsaw strategy as a teaching method in other nursing courses (theory and practice).

Scoring system:

A three point Likert scale was used as the following: score (1) for disagree, score (2) for uncertain and score (3) for agree. The total score was 42 and rated as the following:

- **Satisfactory** if score ≥ 70% (30-42) grades.

-**Unsatisfactory** if score <70% (14-29) grades.

Tools validity:

Tools of data collection were reviewed by three panel expertise of Obstetrics and Gynecological Nursing at Faculty of Nursing, Benha University to test content validity and according to their comments; the questionnaire was modified regarding clarity of sentences and appropriateness of contents.

Tools reliability:

Reliability was done by Chronbach's Alpha co-efficient test which revealed that the internal consistency of academic achievement questionnaire was (0.883) and the internal consistency of cooperative jigsaw opinion scale was (0.981).

Ethical consideration:

Ethical aspects were considered before starting the study as the following:

- The study approval was obtained from scientific research ethical committee of the faculty of nursing at Benha University for fulfillment of the study (REC-OBSNP116).
- An official approval from the selected study setting was obtained for the fulfillment of the study.
- Before applying the tools, the researchers explained the aim and importance of the study to the participants to gain students' confidence and trust.
- The researchers took written consent from students to participate in the study and confidentialities were assured.
- The study didn't have any physical, social or psychological risks on the students.
- All tools of data collection were burned after statistically analysis to promote confidentiality of the participating students.
- The study tools were ensuring that the study didn't cause any harm for any student

during data collection. Also didn't include any immoral statements and respect human rights.

- The students were free to withdraw from study at any time.
- The brochure was given to the control group at the end of the study.

Pilot study:

A pilot study was carried out on 10 % of the total sample (20 students) before starting data collection to test the clarity, feasibility and applicability of tools as well as to estimate the time needed for data collection. According to results of pilot study no modifications were conducted. So, students involved in pilot study were included in the study.

Field work:

The study was carried out at the second academic year 2023- 2024 of Benha technical health institute. It was conducted under the approval of the Faculty of Nursing Ethical Committee. A written official approval to conduct this study was obtained from the dean of faculty of nursing to the dean of Benha technical health institute in order to obtain agreement to conduct the study after explaining its purpose. The researchers visited the study sitting three times/week (Monday, Tuesday and Thursday) from 9.00 am to 12 pm. The study was carried out through the following five phases; preparatory phase, interviewing and assessment phase, planning phase, implementation phase and evaluation phase.

Preparatory phase

The preparatory phase was the first phase of the study. The researchers distributed the tools to three experts in the field of obstetrics and gynecological nursing at faculty of Nursing, Benha University in order to test its appropriateness, comprehensiveness, clarity, importance and applicability. The jury results were done. Finally, the researchers conducted pilot study to a test content validity of tools used.

Interviewing and assessment phase

At the beginning of the interview the researchers greeted the maternity nursing students and introduced themselves to each student involved in the study, the researchers explained the purpose and the importance of the study and provided the students with all information about the study to gain confidence and trust. The researchers took a written consent from students to participate in the study. The studied sample firstly divided into two equal groups (study and control) group (each group included100 maternity nursing students). Both groups were assessed for general characteristics in the classroom by self-administered questionnaire (tool 1). The researchers assessed the students' level of knowledge regarding normal and abnormal puerperium by using pre-test (Tool II) for both groups and then the researchers informed students from both groups about the time of the posttest and follow up.

Planning Phase

The researchers prepared all information regarding the concept, the main purpose and technique of jigsaw cooperative strategy. The researchers determined the lesson plan of study subjects related to normal and abnormal puerperium lectures. Then prepared tools based on recent textbooks, research articles, websites and references. The researchers developed the traditional strategy of teaching "lectures" for the control group and prepared theoretical content "planner" to be given to the students in the study group.

Implementation Phase

A-For the control group (lecture group):

The researchers presented the scientific content in the form of lecture for the control group in (10) teaching sessions, every session took two hours per day, for two days in the

week for five weeks. The total theoretical hours for control group were (20) hours. The researchers gave the lectures at the end of the practical day, presented the lecture for students as powerpoint presentations and at the end of the lecture, the researchers conducted a classroom group discussion for all students to clarify any missing point of contents and the main points of contents were summarized.

B-For study group (Jigsaw group):

Implementation phase included four teaching sessions through 4 weeks as the following consequence:

Session 1: (Orientation Session)

1. Before starting the normal and abnormal puerperium lectures, the study group attended an orientation session for two hours, to be trained on the process of Jigsaw strategy as a teaching method.
2. Firstly, the researchers explained in detail the Jigsaw as a learning strategy including its concept, objectives, steps and benefits to the students through a lecture by using powerpoint presentations. Further, the researchers distributed an illustrated planner describing Jigsaw strategy to students. Then the researchers divided students into 10 groups, each group consisted of (10) students. This group was named as "Jigsaw groups".
3. A team leader from students was chosen by them, was assigned to each group and their function was to facilitate group discussions and sharing.
4. The researchers divided the theoretical content of normal and abnormal puerperium to 10 different outlines as the following:- (definition and physiological changes during puerperium, management of normal pueperium, postpartum hemorrhage, nursing management of postpartum hemorrhage, puerperal sepsis, nursing management of puerperal sepsis, breast engorgement, nursing management of breast engorgement, urinary tract infection and nursing management of urinary tract infection).
5. Each student of the Jigsaw group was assigned for one sub-topic and received a card with his subtopic.
6. Next, the students who were assigned for the same sub-topics in all the Jigsaw groups were collected to form "expert groups". The researcher asked students to prepare the subtopics for discussion in their expert group in the next session after one week.
7. The researchers provided a planner regarding the theoretical content of normal and abnormal puerperium lectures and suggested resources (textbooks, research articles and websites), that directed the students and helped them in preparing their topics. The groups were instructed to prepare and read the topic well and do extra reading than the planner within one week. The researchers ensured that all information about the prepared subtopics by students was accurate and it was corrected before the students started their discussion in front of their groups and clearing their doubts.

Table 1: Formation of Jigsaw group and expert group

	JIGSAW GROUPS										
		(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	TOPICS
Expert Group	G1	A1	B1	C1	D1	E1	F1	G1	H1	I1	J1	1-Definition and physiological changes during puerperium
	G2	A2	B2	C2	D2	E2	F2	G2	H2	I2	J2	2-Management of normal puerperium
	G3	A3	B3	C3	D3	E3	F3	G3	H3	I3	J3	3-Postpartum hemorrhage
	G4	A4	B4	C4	D4	E4	F4	G4	H4	I4	J4	4-Nursing management of Postpartum hemorrhage
	G5	A5	B5	C5	D5	E5	F5	G5	H5	I5	J5	5-Puerperal sepsis
	G6	A6	B6	C6	D6	E6	F6	G6	H6	I6	J6	6-Nursing management of Puerperal sepsis
	G7	A7	B7	C7	D7	E7	F7	G7	H7	I7	J7	7-Breast engorgement
	G8	A8	B8	C8	D8	E8	F8	G8	H8	I8	J8	8-Nursing management of breast engorgement
	G9	A9	B9	C9	D9	E9	F9	G9	H9	I9	J9	9-Urinary tract infection
	G10	A10	B10	C10	D10	E10	F10	G10	H10	I10	J10	10-Nursing management of urinary tract infection

Session 2: (Expert groups discussion)

The expert group worked together for two hours in the next week, discussing their topics. Each student shared his acquired knowledge regarding the topics, the others noted down the additional points and clearing their doubts, if any, to the researchers.

Session 3: (Jigsaw groups discussion)

The students returned to their jigsaw group again to present their subtopic to others. This session took about 2 hours so that each student presented his subtopic. Finally, they discussed topics together to improve their thinking ability, cooperation, interactions and active learning. The researchers moved between groups and facilitated the whole process.

Session 4: (Cooperative learning)

The last (fourth) session lasted for 2 hours during the fourth week in which one student from each "jigsaw group" was selected randomly and was asked to teach a particular topic to the whole class. The student was permitted to use the board. After finishing discussion of all topics, the students also encouraged to ask questions if they had any to the presenter and the researchers clarified their inquiries. Finally, cooperative jigsaw's opinion sheet (tool III) was distributed to assess the

study groups' opinions related to the jigsaw strategy as teaching strategies.

Evaluation Phase

The researchers assessed all the students of both groups for their learning achievements regarding the theoretical part of normal and abnormal puerperium, immediately after (intervention) and after one month of the application of Jigsaw strategy by using tool (II). Then a comparison between two groups (jigsaw group and lecture group) was done to evaluate effect of two teaching strategies in order to investigate the study hypotheses.

Strength of the study:

- Availability of many references related to the study.
- Availability of the maternity nursing students all the time in Benha technical health institute.

Limitations of the study:

- Sometimes interviewing students and the implementation of sessions were postponed as many students were busy most of time with the lectures.

Statistical analysis:

Data was verified prior to computerized entry. The Statistical Package for Social Sciences (SPSS version 20) was used followed by data analysis and tabulation. Descriptive statistics were applied (e.g., mean, standard deviation, frequency and percentages). Also, tests of significance (Chi-square test and Friedman Test) were applied to test the study hypothesis. There was no statistically significant difference when P>0.05 A statistical significant level value was considered when $p \leq 0.05$. And a highly statistical significant level value was considered when $p < 0.001$.

Results:

Table (1): Shows that the mean age 58.0% and 62.0% of the study and control groups was between age group of 18.81±0.75 years and 18.94±0.71 years, respectively. Regarding to gender, 59.0% and 56.0% of the study and control group were females, respectively. Also, 88.0% and 85.0% of the study and control group were single, respectively. Moreover, 67.0% and 62.0% of both groups reside in rural areas, respectively. There were no statistically significant differences between the two groups regarding all their general characteristics (p >0.05) that indicated homogeneity among both groups.

Figure (1): Shows that, 58.0% of the study group achieved a poor score compared to 61.0% in the control group at pre-intervention, while 72.0% of the study group achieved an excellent score compared to 34.0% in the control group immediately post-intervention. Also, 68.0% of the study group achieved an excellent score compared to 15.0% in the control group at follow-up-intervention phase (after one month).

Table (2): Shows that, 91.0% and 92.0% of the study group agreed that, jigsaw strategy made the course content easy to understand and enhanced teamwork cooperation, respectively. Also, 99.0% and 89.0% of them agreed that, jigsaw strategy improved critical thinking and decision-making skills and satisfaction with this teaching method, respectively.

Table (3): Presents that, there was a highly statistically significant relation between total learning achievement of the study group and their age at pre, post and at follow-up phase (P= < 0.01). While, there is no statistically significant relation with their gender, marital status and place of residence at pre, post and at follow-up phase (P= > 0.05).

Table (4): Clarifies that, there was a highly statistically significant positive correlation between total learning achievement score and total opinion regarding the jigsaw method of cooperative learning among the study group after intervention ($P < 0.01$).

Table (1): Distribution of the studied sample according to their general characteristics (N=200).

Variables	Study group (n=100)		Control group (n=100)		X^2	P-Value
	No.	%	No.	%		
Age						
18- < 19 years	58	58.0	62	62.0	0.333	0.564
19 - 20 years	42	42.0	38	38.0		
Mean ± S.D	**18.81±0.75**		**18.94±0.71**			
Gender						
Male	41	41.0	44	44.0	0.184	0.668
Female	59	59.0	56	56.0		
Marital status						
Single	88	88.0	85	85.0	0.385	0.535
Married	12	12.0	15	15.0		
Place of residence						
Rural area	67	67.0	62	62.0	0.546	0.460
Urban area	33	33.0	38	38.0		

X^2: Chi-square test. **T**: Independent t-test. No statistically significant at p >0.05.

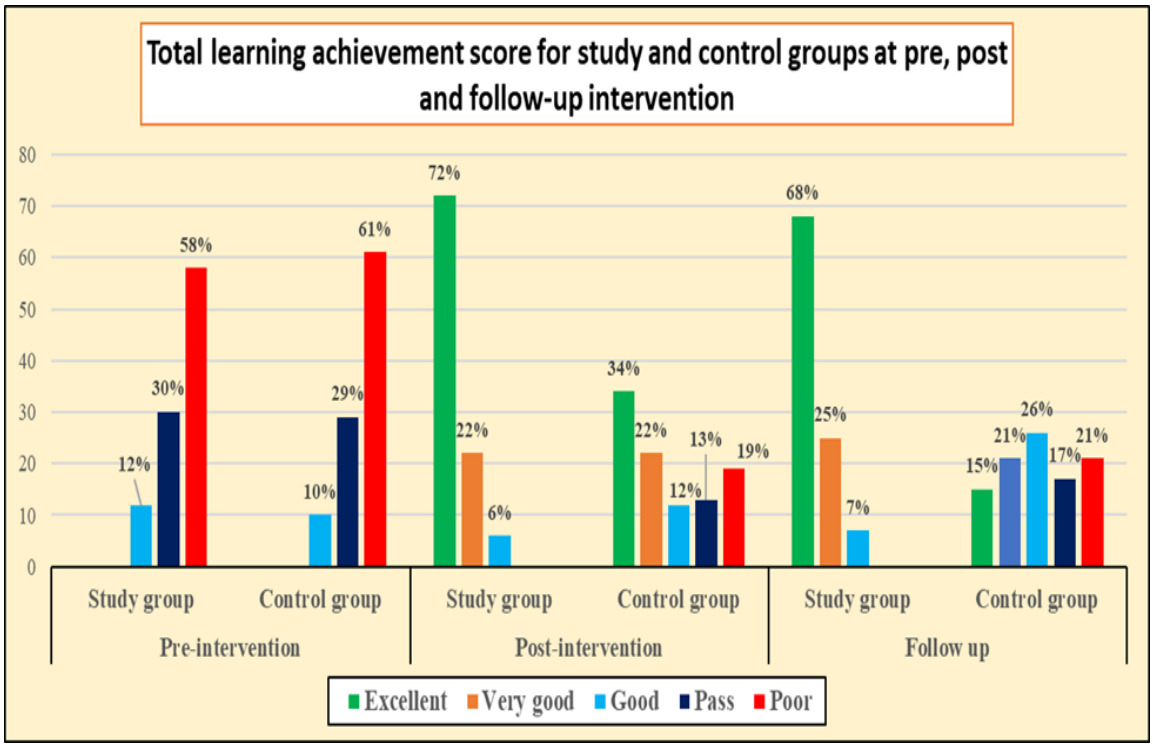

Figure (1): Distribution of total learning achievement score for both study and control groups at pre, post (immediately after intervention) and follow-up (after one month) of intervention (N=200).

Table (2): Distribution of the study group according to their opinion regarding the jigsaw method of cooperative learning after intervention (N=100).

Items	Study group (n=100)					
	Agree		Uncertain		Disagree	
	No.	%	No.	%	No.	%
Jigsaw technique made the course content easy for us to understand.	91	91.0	9	9.0	0	0.0
Jigsaw technique made the course content easy to understand.	89	89.0	9	9.0	2	2.0
Jigsaw technique ensured the correction of misinformation.	83	83.0	14	14.0	3	3.0
Jigsaw technique made students learn better.	86	86.0	9	9.0	5	5.0
Jigsaw technique increased the possibility of the teacher's interested in each student.	89	89.0	8	8.0	3	3.0
The dependence of the students upon the teacher was lessened.	88	88.0	10	10.0	2	2.0
Jigsaw technique enhanced communication skills and self-confidence.	92	92.0	8	8.0	0	0.0
Jigsaw technique enhanced teamwork cooperation.	89	89.0	9	9.0	2	2.0
Everyone in the group shared responsibility.	84	84.0	12	12.0	4	4.0
Jigsaw technique made the ideas within the group to be discussed more positively.	99	99.0	1	1.0	0	0.0
Jigsaw technique improved critical thinking and decision-making skills.	88	88.0	10	10.0	2	2.0
Jigsaw technique facilitated applying knowledge into clinical practice.	87	87.0	11	11.0	2	2.0
Jigsaw technique was the innovative teaching learning method.	89	89.0	11	11.0	0	0.0
Overall, The student satisfied with Jigsaw teaching method.	85	85.0	11	11.0	4	4.0
Applying Jigsaw strategy as a teaching method in other nursing courses (theory and practice).	**40.11±4.99**					

Table (3): Relation between general characteristics of the study group and their total learning achievement throughout study periods (N=100).

Variables		Total learning achievement pre-intervention						Test of sig.	Total learning achievement post- intervention (immediately after)						Test of sig.	Total learning achievement at follow-up phase(after one month)						Test of sig.
		Good (n=12)		Pass (n=30)		Poor (n=58)			Excellent (n=72)		Very good (n=22)		Poor (n=6)			Excellent (n=68)		Very good (n=25)		Poor (n=7)		
		No.	%	No.	%	No.	%		No.	%	No.	%	No.	%		No.	%	No.	%	No.	%	
Age (years)	18- < 19	0	0.0	0	0.0	58	100.0	X^2=100.00 p=0.000**	30	41.7	22	100.0	6	100.0	X^2=28.16 p=0.000**	26	38.2	25	100.0	7	100.0	X^2=34.07 p=0.000**
	19 – 20	12	100.0	30	100.0	0	0.0		42	58.3	0	0.0	0	0.0		42	61.8	0	0.0	0	0.0	
Gender	Male	5	41.7	12	40.0	24	41.4	X^2=0.018 p=0.991	25	34.7	14	63.6	2	33.3	X^2=5.979 p=0.050	23	33.8	16	64.0	2	28.6	X^2=7.362 p=0.055
	Female	7	58.3	18	60.0	34	58.6		47	65.3	8	36.4	4	66.7		45	66.2	9	36.0	5	71.4	
Marital status	Single	11	91.7	26	86.7	51	87.9	X^2=0.204 p=0.903	65	90.3	17	77.3	6	100.0	X^2=3.569 p=0.168	62	91.2	19	76.0	7	100.0	X^2=5.013 p=0.082
	Married	1	8.3	4	13.3	7	12.1		7	9.7	5	22.7	0	0.0		6	8.8	6	24.0	0	0.0	
Place of residence	Rural area	9	75.0	19	63.3	39	67.2	X^2=0.531 p=0.76	48	66.7	16	72.7	3	50.0	X^2=1.114 p=0.573	45	66.2	18	72.0	4	57.1	X^2=0.611 p=0.737
	Urban area	3	25.0	11	36.7	19	32.8		24	33.3	6	27.3	3	50.0		23	33.8	7	28.0	3	42.9	

Table (4): Correlation between total learning achievement of the study group and their total opinion regarding the jigsaw method of cooperative learning after intervention (N=100).

Variables	Total learning achievement after intervention	
	R	P- value
Total opinion regarding the jigsaw method of cooperative learning after intervention	0.723	0.000**

Discussion:

The postpartum period is defined as the period that begins immediately after childbirth and ends after six weeks. It is noteworthy that the postpartum period is a critical period for the woman, newborn and family and is considered very challenging as it implies an adaptation to new roles especially in primiparous woman but also emotional, physical, social and spiritual changes **(Sendas and Freitas, 2024).**

Cooperative learning is a well-structured and carefully planned learning strategy, used to facilitate a sustained learning group with interdependent members working towards a specifc academic goal under guidance **(Jeppu et al., 2023).**

Jigsaw learning method is a kind of cooperative learning method. This approach has been claimed to minimize the competitiveness in the learning environment by encouraging students for cooperative work. Besides, Jigsaw learning method is claimed to promote more

positive student attitudes toward learning, enhance more positive relationships between students, develop self-esteem and cohesiveness and improve learning skills **(Crist, 2023).**

The present study aimed to evaluate the effect of Jigsaw cooperative learning strategy on academic achievement among maternity nursing students. The results of the present study were significantly supported the study hypotheses.

As regards general characteristics of the studied nursing students, the present study results revealed that more than one half of the study group and nearly two third of the control group were in the age group of 18- < 19 years with mean age of 18.81±0.75 years and 18.94±0.71 years respectively with no significant difference found between the study and control groups regarding general characteristics.

This result is similar to a study performed by **Mazen et al., (2025)** who studied "Effect of jigsaw learning Method on Theoretical and Practical Achievement of Technical Nursing Institute regarding the Second Stage of Labour, Egypt ", and showed that there were no statistically significant differences in the socio-demographic characteristics between the study and control groups ($p > 0.05$).

Regarding gender of the studied students, the result of the present study showed that more than half of the study and control groups were females, this result is similar to **EL-refaie et al., (2023)** who studied "Effect of Jigsaw learning Strategy on Maternity Nursing Students' Theoretical Achievements, Egypt", on 150 nursing students and found that more than two third of the studied students were female.

This result is contraindicated with **Rabea et al., (2024)** who studied "The Effect of Interactive Learning Environment on Maternity Nursing Students' Achievement in the Clinical Setting", and reported that nearly only one third of the study and control group were females.

Concerning marital status of the studied maternity nursing students, the result of the current study revealed that the majority of the study and control groups were single, this study finding is in same line with **Abdel-Mordy et al., (2022)** who studied "Effect of Cooperative Jigsaw Learning Strategy on Community Nursing Students' Attitude and Achievement, Egypt", and reported that the majority of the study and control groups of nursing students were single.

It can be noticed that students of the study and control groups were matching in almost all of their general characteristics including age, gender, marital status and residence that indicate homogeneity among both groups. This consistent profile of participants was useful in limiting extraneous factors, which could interfere with the effect of the intended intervention on students' knowledge about normal and abnormal puerperium. It also helped in understanding and securing the reliability and relevance of the forthcoming results of the current study.

From **the researcher point of view** this is due to the fact that the students of the study sample were subjected to the same teaching environment and the same educational opportunities, the curriculum for both male and female students had the same activities.

Concerning learning achievement of the maternity nursing students in both groups regarding normal and abnormal puerperium at pre, post (immediately after intervention) and follow-up (after one month) of intervention of jigsaw learning strategy implementation, the result of the present study revealed that there was no significant difference between the study and control groups regarding total knowledge subscales regarding normal and abnormal puerperium at pre intervention ($P > 0.05$). While, there was a highly statistically

significant difference between the study and control groups regarding total knowledge subscales regarding normal and abnormal puerperium immediately post intervention (P < 0.01). Furthermore, there was a highly statistically significant difference between the study and control group regarding total knowledge subscales regarding normal and abnormal puerperium after one month of intervention (P < 0.01).

Also, nearly two third of the study and control groups achieved a poor score at pre-intervention. While, more than two third of the study group achieved an excellent score compared to only one third in the control group immediately post-intervention. Moreover, about two third of the study group achieved an excellent score compared to less than one quarter in the control group at follow-up-intervention phase (after one month).

This result **may be due to** the positive effect of the jigsaw learning strategy, the learning sessions and simple explanations that was given to students. So, nursing students were very interested and satisfied during the learning sessions and also jigsaw learning strategy is an effective way for active learning that enables students to improve their knowledge retention, critical thinking and decision-making skills.

The current finding is in harmony with **Ogbiku and Ajaja, (2024)** who studied "Comparative Effects of Jigsaw Cooperative Learning and Lecture Method on Biology Students' Achievement and Retention in Delta Central Senatorial District" and revealed that in comparison to the lecture approach, it was found that jigsaw cooperative learning strategy improves students' comprehension and long-term recall of biology knowledge more.

Also, this results in agreement with the study of **Rehman et al., (2024)** who studied "The Effectiveness of Jigsaw Cooperative Learning Strategy among Bachelor Nursing Students at Ziauddin University, Karachi, Pakistan", and found that the students who followed jigsaw strategy are statistically significally higher rates than the control group (P= < 0.001).

Furthermore, this study finding is in consistent with **Ordu and Çalışkan, (2025)** who studied "The Effect of the Jigsaw Technique on Nursing Students' Learning of Employee Safety and Retention of Knowledge: A Randomized Controlled Research, Turkey", and revealed that the jigsaw technique was effective in students' learning of employee safety and retest of knowledge and the post-test average score of the students in the study group was statistically significantly higher than the control group.

In addition, this result agrees with **Rashed et al., (2023)** who studied "Effect of Jigsaw Learning Strategy on Nursing Students' Understanding of Normal Labour Concept, Egypt", on 100 nursing students and showed that there was a significant difference in the knowledge score between pre and post-test results at (p value=<0.001).

On the other hand, this result is contradicted with **Sarikaya and Eğmir, (2023)** who studied "The Effect of Cooperative Learning Method on Academic Achievement, Attitude and Critical Thinking Disposition in the 7th Grade Mathematics Lesson, Turkey" and revealed that the cooperative learning method was not effective in improving learning and the cooperative teaching technique was ineffective in increasing the mean scores of the students' critical thinking disposition.

Concerning students' opinion regarding Jigsaw learning strategy in study group, the result of this study illustrated that this method enhanced team work cooperation, improved

critical thinking and decision-making skills. Also more than three quarters of the study group was satisfied regarding the jigsaw cooperative learning strategy compared with less than one quarter of students had unsatisfactory opinion regarding Jigsaw cooperative learning strategy.

From **the researchers point of view**, the Jigsaw strategy is an effective way of transforming the nursing students from passive to active learners. In addition, students working in cooperative learning groups enjoyed cooperative activities as cooperative learning improved relationships with peers, decreased conflict in the group and enhanced self-esteem. Also, students in the cooperative learning groups felt more interested in learning and less anxious. In addition, this might be due to the Jigsaw strategy empowers the students to take charge of learning, retention, peer tutoring, communication skills and retrieval of concepts.

This result matches with the study of **Hanapi and Mawardi, (2024)** who studied "Jigsaw classroom: A process of Cooperative Learning and Discussion, Malaysia", showed that about two third of the studied sample prefer using Jigsaw learning strategy as it enhanced student communication, attitudes, relationships and retention compared to traditional competitive or individualistic methods.

Additionally, this result agrees with **Lee, (2025)** who studied "The Effects of Jigsaw Cooperation Learning on Self-Directed Learning Ability, Academic Self-Efficacy and Critical Thinking Dispostion of Nursing Students, Korea", and reported that the majority of the studied nursing students had been enhanced team work, communication skills, critical thinking skills and promoted self-confidence after applying the Jigsaw cooperative learning strategy.

This result is also consistent with **Abdel-Mordy et al., (2022)** who reported that the majority of the maternity nursing students agreed that the Jigsaw method encouraged listening, engagement, communication skills and self-confidence compared to less than one quarter of the students had unsatisfactory opinion regarding Jigsaw learning method.

Regarding relation between students' general characteristics and the studied variables among the study group throughout study periods, the present study revealed that there was a highly statistically significant relation between total learning achievement of the study group and their age at pre, post and at follow-up phase ($P < 0.01$). While, there was no statistically significant relation with their gender, marital status and place of residence at pre, post and at follow-up phase ($P > 0.05$).

This result contraindicated with **El-Refaie et al., (2023)** revealed that there is statistically significant relation between educational level and knowledge level of the students after jigsaw ($P<0.001$). While, there was no statistically significant relation with their age, gender, marital status and place of residence at pre, post and at follow-up phase.

Concerning correlation between total learning achievement of the study group and their total opinion regarding the jigsaw method of cooperative learning after intervention, the present study clarified that, there was a highly statistically significant positive correlation between total learning achievement score and total opinion regarding the jigsaw method of cooperative learning among the study group after intervention ($P < 0.01$).

The finding of the present study is in same line with **Farrag et al., (2022)** who studied "Jigsaw Cooperative Learning Strategy: An Effective Tool for Improving Maternity Nursing Students' Achievement" and revealed that there was an extremely statistically significant association between the total achievement scores of the jigsaw group and their overall self-confidence and

happiness with cooperative jigsaw as a learning approach at midterm and final exam.

From **the researchers point of view**, this may be attributed to the nature of cooperative learning method that encourages students to generate the highest number of ideas that are varied and creative in a spontaneous and free open climate that doesn't limit the freedom of launching ideas that foster the deep learning level and taught the nursing students how to well-regulate their own learning, managed time and efforts effectively.

Conclusion:

The implementation of the Jigsaw learning strategy was effective than traditional teaching method (lecture) in the improvement of maternity nursing students' academic achievement regarding normal and abnormal puerperium. Also, most of students had satisfactory opinion regarding Jigsaw learning strategy. Moreover, there was a highly statistically significant positive correlation between total learning achievement score and total opinion regarding the jigsaw method of cooperative learning among the study group after intervention. Hence, the aim was achieved and the study hypotheses were supported.

Recommendations:

- Nursing programs should use a wide range of innovative teaching techniques, such as the Jigsaw strategy, to make learning more student-centered.
- Jigsaw cooperative learning strategy should be incorporated in obstetrics nursing education.

Further study needs to be performed:

Further researches are needed to study effect of Jigsaw learning strategy on clinical achievement.

Additional studies are required to examine the barriers preventing implementation of jigsaw learning approach in nursing education.

References:

Abd El Aliem R., Sabry S., and MohyEl-Deen H., (2019). Utilization of Jigsaw Cooperative Learning Strategy on Maternity Nursing Students' Attitude and Achievement, American Journal of Nursing Science, 8(6): 361-370.

Abdel-Mordy M., Sabry S., and Abdelrazek A., (2022). Effect of cooperative jigsaw learning strategy on community nursing students' attitude and achievement, International Egyptian Journal of Nursing Sciences and Research, 2 (2): 494.

Alqersh D., Nada E., and Ahmed A., (2024). Effect of Jigsaw Teaching Strategy on Internship Nursing Students' Health Literacy Regarding Menstrual Blood Banking, International Egyptian Journal of Nursing Sciences and Research, 4 (2): 113-126.

Al-Saluli S., Alenazi H., Al-Qahtani F., Majrashi H., Alrwaili D., Alruwaili A., and et al., (2024). The Role of Nurses in Obstetric Care: Comprehensive Review, Journal of International Crisis and Risk Communication Research 7 (S8): 156.

Bilgiç D., Güler B., Yanik F., Yağcan H., Parlas M, Tokat M., and et al ., (2024). Online and Constructivist Learning Approach Based Obstetrics and Gynecology Nursing Course Experiment, Bingöl Üniversitesi Sağlık Dergisi, 5 (2): 69-82.

Cholifah S., (2024). Educational environment in the implementation of character education, Journal of Scientific Research, Education and Technology (JSRET), 3(2), 816-825.

Crist L., (2023). The Effectiveness of the Jigsaw Approach and Other Cooperative Learning Strategies with Students with Learning Disabilities: A Master's Research Project Beforecited to The Faculty of the Patton College of Education and Human Services, Ohio University.

EL-refaie F., Farouk O., Mousa S., and Mustafa S., (2023). Effect of Jigsaw learning Strategy on Maternity Nursing Students' Theoretical Achievements, Egyptian Journal of Health Care, 14 (3): 675-685, 680.

Farrag R., Ahmed S., and Nasr E., (2022). Jigsaw Cooperative Learning Strategy: An Effective Tool for Improving Maternity Nursing Students' Achievement, Retention and Self Confidence, Egyptian Journal of Health Care, 13 (1): 1926.

Gomes-Ferreira M., and Olivas-Menayo J., (2023). Changes and potential complication during puerperium, Post-maternity Body Changes: Obstetric Fundamentals and Surgical Reshaping, 1st ed., Springer International Publishing, Germany, P.129.

Grace K., Farley C., Jeffers N., and Tringali T., (2023). Preconception, Prenatal care and Postnatal care, Prenatal and Postnatal care, 3rd ed., Wiley, USA, Pp.451-458.

Haider A., Rehman J., and Ali S., (2025). Comparative study of the effect of two small group discussion teaching methods (Tutorial vs Jigsaw) on academic motivation and achievement of undergraduate dental students, BMC Medical Education, 25: 660.

Hanapi N., and Mawardi M., (2024). Jigsaw classroom: A process of cooperative learning and discussion, Semarak International Journal of Innovation in Learning and Education, 1 (1): 26.

Hasanah U., Chasanah U., Talib U., Zumirddat W., (2025). Jigsaw Type Cooperative Learning Model to Improve Students' Cooperation and Tolerance Character at MI Siti Fatimah Tawangrejeni Turen, Journal of Educational Research, 1 (1): 81-93.

Ibeh J., Okigbo E., (2024). and Effect of Jigsaw Learning Strategy on Secondary School Students' Academic Achievement in Biology in Awka South Local Government Area, Anambra State, Journal of Educational Research and Policy Studies, 18 (3): 24-35.

Jeppu K., Kumar A., and Sethi A., (2023). We work together as a group': Implications of jigsaw cooperative learning, BMC Medical Education, 23 (1): 1-8.

Lee S., (2025). The Effects of Jigsaw Cooperation Learning on Self-Directed Learning Ability, Academic Self-Efficacy and Critical Thinking Dispostion of Nursing Students, Journal of the Korean Society of Industry Convergence, 28 (2_2), 365-373.

Mazen H., Omran A., Ramadan E., and Ali F., (2025). Effect of jigsaw learning Method on Theoretical and Practical Achievement of Technical Nursing Institute regarding the Second Stage of Labour, PHD degree, Benha University, Egypt, P.83.

Ogbiku N., and Ajaja P., (2024). Comparative Effects Of Jigsaw Cooperative Learning And Lecture Method On Biology Students' Achievement And Retention In Delta Central Senatorial District, International Journal of Innovative Psychology and Social Development, 12 (3): 90-96.

Ordu Y., and Çalışkan N., (2025). The Effect of the Jigsaw Technique on Nursing Students' Learning of Employee Safety and Retention of Knowledge: A Randomized Controlled Research, European Journal of Education, 60 (1): e70038.

Ozkan S., and Uslusoy E., (2024). Outcomes of jigsaw technique in nurse education: A systematic review and meta-analysis, Nurse Education in Practice, 75 (5): 103902.

Rabea W., Abd-El Moneim E., and Farrag R., (2024). The Effect of Interactive Learning Environment on Maternity Nursing Students' Achievement in the Clinical Setting, International Journal of Novel Research in Healthcare and Nursing, 11 (2): 291.

Rashed A., Abu Almakarem A., Kahlil E., and Ahmed A., (2023). Effect of Jigsaw Learning Strategy on Nursing Students' Understanding of Normal Labor Concept, Egyptian Journal of Health Care, 14 (4): 202.

Rehman A., Raja R., Husain A., and Ghouri A., (2024). The effectiveness of jigsaw cooperative learning strategy among bachelor nursing students at ziauddin university, Karachi, Journal of Medical Sciences, 32 (1): 47–52.

Ross M., (2025). Active Learning Tools, 1st ed, Publifye AS, Norway, P:21.

Sarikaya A., and Eğmir E., (2023). The Effect of Cooperative Learning Method on Academic Achievement, Attitude and Critical Thinking Disposition in the 7th Grade Mathematics Lesson, International Journal of Educational Research Review, 8(4): 740–757.

Sendas V., and Freitas J., (2024). The needs of women in the postpartum period: a scoping review, Midwifery, 104098.

WHO, (2024). Supporting Women, Parents and Families for a Positive Postnatal Experience Key Information for Advocates, available at: https://books.google.com/books/about/Supporting_women_parents_and_families_fo.html?hl=ar&id=8aUOEQAAQBAJ#v=onepage&q&f=false, accessed on 28. May. 2025.

Yadav G., Bhattacharya S., Agrawal S., Patel R., Kumar M., Bhalla S., and Jaiswal R., (2025). Optimizing Small Group Learning: A Comparative Study of Jigsaw Technique and Case-Based Learning Methods in Medical Education: 1-14, https://doi.org/10. 21203/rs.3.rs-6034663/v1.

Yamane, (1967). formula to calculate sample size, available at: https://people.utm.my/maslin/2020/02/24/yamane-1967-formula-to-calculate-sample-size/, accessed on 14. Oct 2023.

تأثير استراتيجية التعلم التعاوني (چيجسو) على التحصيل الدراسي بين طلاب تمريض الأمومة

إيمان هلال السيد محمود البطاوي- سامية عبد الحكيم حسنين عبود- عفاف محمد إمام

تعتبر استراتيجية التعلم التعاوني (چيجسو) هي طريقة لتعلم المقرر الدراسي بأسلوب التعلم التعاوني. الهدف: تقييم تأثير استراتيجية التعلم التعاوني (چيجسو) على التحصيل الدراسي بين طلاب تمريض الأمومة. مكان الدراسة: اجريت الدراسة في المعهد الفني الصحي ببنها بمحافظة القليوبية. نوع الدراسة: دراسة شبه تجريبية. العينة: استُخدمت عينة عشوائية منتظمة اشتملت على ٢٠٠ طالب من طلاب تمريض الأمومة ، وتم تقسيمهم بالتساوي إلى مجموعتين. أدوات جمع البيانات: استُخدمت ثلاث أدوات لجمع البيانات وهما: ١) استبيان المقابلة الذاتي، ٢) استبيان التحصيل الدراسي المتعلق بفترة النفاس الطبيعية وغير الطبيعية. ٣) استبيان تقييم رأي مجموعة الدراسة في استخدام استراتيجية (چيجسو) في التعلم الجماعي. النتائج: أظهرت نتائج الدراسة أن متوسط درجات تحصيل طلاب تمريض الأمومة فيما يتعلق بفترة النفاس الطبيعية وغير الطبيعية كان أعلى إحصائيًا في مجموعة الدراسة مقارنةً بمجموعة التحكم في مرحلتي ما بعد تطبيق استراتيجية التعلم التعاوني (چيجسو) والمتابعة، كما أبدى أكثر من ثلاثة أرباع المشاركين في الدراسة رضاهم عن استراتيجية التعلم التعاوني (چيجسو). الخلاصة: أثبتت استراتيجية التعلم التعاوني (چيجسو) فعاليتها بشكل ملحوظ في تحسين التحصيل الدراسي لطلاب تمريض الأمومة. التوصيات: تطوير برنامج توعية دوري لطلاب المعاهد الفنية للتمريض لتعزيز تحصيلهم الدراسي في تعليم تمريض الأمومة.