Effect of Jigsaw Cooperative Learning Strategy on Students' Knowledge, Satisfaction and Self-Confidence in Maternity Nursing Education

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Abstract

Background: Jigsaw is a simple cooperative teaching strategy that can make students interested in learning activities. **Aim of the study:** Was to evaluate effect of Jigsaw cooperative learning strategy on students' knowledge, satisfaction and self-confidence in maternity nursing education. **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 equally into two groups control and study groups. **Tools of data collection:** Four tools were used: **Tool I):** A structured self-administrated questionnaire: included general characteristics of the technical nursing institute students. **Tool II):** Assessment Knowledge Questionnaire. **Tool III):** Satisfaction and Self-confidence Questionnaire. **Tool IV):** Cooperative Jigsaw opinion scale. **Results:** The present study results revealed that, the mean score of maternity nursing students' knowledge regarding normal 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, there was a highly statistically significant difference between study and control group regarding all items of satisfaction and self-confidence post intervention ($P < 0.01$). Moreover, 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' knowledge, satisfaction and self-confidence. **Recommendations:** apply cooperative jigsaw learning strategy as a teaching method in nursing student curriculums.

Keywords: Jigsaw Learning Strategy, Students' Satisfaction, Students' Self-Confidence.

Introduction:

In recent years, there is a growing awareness of the need for changes in nursing education systems, especially in developing self-learning techniques where the student is an active participant in the learning process for improving, enhancing and preparing nursing students' skills to ensure the high quality of nursing care practice after graduation. The Jigsaw cooperative learning approach is one method that can be utilized to enhance students' active participation in the learning process **(Cosme, 2023).**

The jigsaw technique was founded by Elliot Aronson in 1978. The technique is designed for cooperative learning in small groups. Learners are provided the opportunity to become experts in a given assignment and share their knowledge with their peers in class. The jigsaw technique is known by educators for providing both self and peer teaching and learning which requires students to understand the material at a deeper level and engage in discussions with the other learners **(Ayiro, 2022).**

The Jigsaw learning strategy has several advantages: It allows students to be good listeners, show respect to team members, enhance knowledge retention, improve critical thinking and enhance satisfaction and self-confidence,

communication skills, problem-solving skills, attitudes towards learning, motivation and sense of responsibility. It also reduces racial conflict among students, promotes better learning, improves student motivation and increases enjoyment of the learning experience **(Moin et al., 2024).**

Nursing student satisfaction refers to a positive feeling that arises from the experiences and outcomes that nursing students have encountered. While, nursing student self-confidence is characterized by the willingness to complete tasks and skills, select appropriate and successful approaches to problem-solving and make effective decisions. Notably, the incorporation of interactive teaching methods in both the classroom and clinical settings can help to bolster nursing students' confidence in their knowledge and abilities. This increased self-confidence is an important outcome, as it empowers nursing students to pass the educational and professional experiences with greater proficiency **(Moreno-Cámara et al., 2024).**

The postpartum period, also known as the "fourth trimester" is a critical time for both the mother and newborn, encompassing the weeks and months following childbirth. The postpartum period refers to the time immediately following childbirth during which the mother's body undergoes significant changes as it gradually returns to its pre-pregnancy state. This period is marked by hormonal shifts, physiological adjustments, emotional and psychological changes for the mother as well as the newborn's adjustment to life outside the uterus **(Thompson, 2023).**

The main objective of nursing management of the postpartum period is to facilitate physiological and psychological adaptation of the mother. It also aims to identify any problems the mother may develop at the earliest and to take appropriate preventive and corrective interventions for the actual and potential problems. The components of nursing care during the postpartum period include assisting with recovery, regularly assessing and monitoring, preventing complications and managing discomfort, providing direct care as required, providing information and educating the mother, as well as counseling **(Viswanath and Raddi, 2023).**

It is necessary to combine and synthesize theoretical information and practical skills in nursing education. Through nursing education, students should be made to internalize nursing-related knowledge, skills, attitudes, professional values and ethical standards and incorporate them into their behaviors **(Bilgiç et al., 2024).**

Significance of the Study:

A teaching method is the way information is taught that brings the learner into contact with what is to be learned. Traditional teaching methods, also known as the lecture-based or didactic approach, encompass a variety of instructional techniques and practices that have been used in classrooms for many years. Examples of such methods include lectures, face-to-face interaction, mainly from the teacher to the student, readings or other forms of presentation **(Bastable, 2021).**

Cooperative learning strategies differs from the traditional, teacher-centered classroom in that it is student-centered, these learning methods positively affect the communication and relations within the group, increases the motivation and success of the students and give the students critical thinking and problems solving skills. It has been determined that cooperative learning strategies are more effective than traditional methods in the success of students at all educational levels. Among these strategies is the Jigsaw learning strategy. It is one of the most popular and commonly adopted models of cooperative learning **(Yaz et al., 2023).**

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 students' knowledge, satisfaction and self-confidence in maternity nursing education.

Aim of the Study:

The aim of this study research was to evaluate the effect of Jigsaw cooperative learning strategy on students' knowledge, satisfaction and self-confidence in maternity nursing education.

This aim was achieved through:

1. Assessing maternity nursing students' level of knowledge regarding normal 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 puerperium.
3. Evaluating effect of jigsaw cooperative learning strategy on maternity nursing students' learning knowledge, satisfaction and self-confidence.

Study research hypotheses

H1. The maternity nursing students who would participate in Jigsaw cooperative learning strategy would have knowledge compared to their peers in the lecture group. H_2. The maternity nursing students who would participate in jigsaw cooperative learning strategy would have higher satisfaction and self-confidence level compared to their peers in the lecture group.

Subjects and Method:

Study research design:

A quasi-experimental study design (two groups study & control) were utilized to achieve the aim of this 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 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 Assessment Knowledge Questionnaire:

It was designed by the researcherss after reviewing related literature **(Grace et al., 2023)** to assess the students' knowledge through different strategies of learning among both control and study groups at pre, immediately after and follow up (after one month of intervention). It consisted of 14 items in the form of MCQ questions about the theoretical content of normal puerperium as the following: - (definition and physiological changes during puerperium (13), management of normal pueperium (1).

Scoring system:

Each correct answer gave score (2) while incorrect answer gave score (1), the total knowledge scores were 28 and rated according to the operational scoring system at the academic setting in Egypt range as the following:

1. Excellent: if score 85%-100% (24-28) grades.
2. Very good: if score 75% (21-23) grades.
3. Good: if score 65% (18-20) grades.

4. Pass: if score 60% (17-18) grades.
5. Poor: if score <60% (<16) grades.

Tool III Satisfaction and Self-confidence Questionnaire:

It was adapted from **Jeffries (2005)** and modified by the researchers to assess maternity nursing students' satisfaction and self-confidence toward both methods of teaching strategies (both groups). This questionnaire was contained of 11 statements as the following:- (the teaching methods used in the course were helpful and effective, the course provides a variety of learning materials and activities to promote learning curriculum, students enjoyed how the instructor taught the course, the teaching materials used in the course were motivating and helped in learning process, students were confident of mastering the content of the course, the courses covered critical content necessary for the mastery of the curriculum, students were confident of developing the skills and obtaining the required knowledge from the courses to perform necessary tasks in a clinical setting, teachers used helpful resources to design the courses, it is the responsibility of the students to learn what they need to know from the course activity, students know how to get help when the concepts covered in the courses are not understood, students know how to use course activities to learn critical aspects of these skills).

Scoring system:

A three point Likert scale was used to assess students' satisfaction and self-confidence as the following: Each item gave score (1) for disagree, score (2) for uncertain and score (3) for agree. The total score was 33and rated as the following:

- **High** satisfaction and self-confidence when score ≥ 75% (25-33) grades.
- **Moderate** satisfaction and self-confidence if when score 50-< 75% (17-24) grades.
- **Low** satisfaction and self-confidence when score <50% (11-16) 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 knowledge questionnaire was (0.754), the internal consistency of satisfaction and self-confidence questionnaire was (0.983) and the internal consistency of cooperative jigsaw opinion scale was (0.981).

Ethical considerations:

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-OBSNP117).
- .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 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. 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.

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 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).

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 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 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 puerperium to 10 different outlines as the following:- (definition of postpartum period, the anatomical site of the fundal level of the uterus during postpartum period immediately after labor, the physiological changes that occur in the size of the uterus during the postpartum period, the weight of the uterus at the end of postpartum period, the physiological changes that occur in the vagina and the perineal area during postpartum period, the characteristics of the uterine discharge (lochia) during postpartum period, the physiological changes that occur in the breast during postpartum period, the change that occurs in body temperature, respiratory rate, the pulse rate and the blood pressure during postpartum period, the physiological changes in body weight that occur during postpartum period, management of normal puerperium.
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 researchers 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 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 of postpartum period
	G2	A2	B2	C2	D2	E2	F2	G2	H2	I2	J2	2- The anatomical site of the fundal level of the uterus during postpartum period immediately after labor
	G3	A3	B3	C3	D3	E3	F3	G3	H3	I3	J3	3- The physiological changes that occur in the size of the uterus during the postpartum period
	G4	A4	B4	C4	D4	E4	F4	G4	H4	I4	J4	4-The weight of the uterus at the end of postpartum period
	G5	A5	B5	C5	D5	E5	F5	G5	H5	I5	J5	5- The physiological changes that occur in the vagina and the perineal area during postpartum period
	G6	A6	B6	C6	D6	E6	F6	G6	H6	I6	J6	6- The characteristics of the uterine discharge (lochia) during postpartum period,
	G7	A7	B7	C7	D7	E7	F7	G7	H7	I7	J7	7- The physiological changes that occur in the breast during postpartum period,
	G8	A8	B8	C8	D8	E8	F8	G8	H8	I8	J8	8- The change that occurs in body temperature, respiratory rate, the pulse rate and the blood pressure during postpartum period
	G9	A9	B9	C9	D9	E9	F9	G9	H9	I9	J9	9- The physiological changes in body weight that occur during postpartum period
	G10	A10	B10	C10	D10	E10	F10	G10	H10	I10	J10	10- Management of normal puerperium.

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 IV) 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 knowledge regarding the theoretical part of normal puerperium before,

immediately after (intervention) and after one month of the application of Jigsaw strategy by using tool (II). Also, the researchers assessed the students' satisfaction and self-confidence regarding the two teaching strategies that were used among both groups by using (tool III). Then a comparison between two groups (Jigsaw group and lecture group) was done to evaluate the 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.

Table (2): Displays that, there was no significant difference between the study and control group regarding all knowledge items about normal puerperium at pre intervention ($P > 0.05$). Moreover, there was a highly statistically significant difference between the study and control group regarding all knowledge items about normal puerperium immediately post intervention ($P < 0.01$). Furthermore, there was a highly statistically significant difference between the study and control group regarding all knowledge items about normal puerperium after one month of intervention ($P < 0.01$).

Figure (1): Shows that, 81.0% of the study group has high level of satisfaction and self-confidence compared to 16.0% in the control group.

Figure (2): Reveals that, 88.0% of the study group was satisfied regarding the jigsaw method of cooperative learning, while, 12.0% of them were un-satisfied.

Table (3): Reveals that, there was a highly statistically significant relation between total satisfaction and self-confidence of the study and control group and their age at post intervention phase ($P < 0.01$). While, there is no statistically significant relation with their gender, marital status and place of residence at post intervention phase ($P > 0.05$).

Table (4): Clarifies that, there was a highly statistically significant positive correlation between total satisfaction and self-confidence 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.

Table (2): Distribution of the studied sample according to their knowledge regarding normal puerperium at pre, immediately and follow-up (after one month) of intervention (N=200).

Items		Study group (n=100)						Control group (n=100)						Test of significance		
		Pre		Post (immediately)		Follow-up (after one month)		Pre		Post (immediately)		Follow-up (after one month)		(p_1)	(p_2)	(p_3)
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%			
Definition of postpartum period	Correct	60	60.0	95	95.0	94	94.0	39	39.0	73	73.0	71	71.0	X^2=021 p=0.885	X^2=18.00 p=0.000**	X^2=18.32 p=0.000**
	Incorrect	40	40.0	5	5.0	6	6.0	61	61.0	27	27.0	29	29.0			
The anatomical site of the fundal level of the uterus during postpartum period immediately after labor	Correct	51	51.0	98	98.0	96	96.0	48	48.0	70	70.0	66	66.0	X^2=0.180 p=0.671	X^2=29.16 p=0.000**	X^2=29.24 p=0.000**
	Incorrect	49	49.0	2	2.0	4	4.0	52	52.0	30	30.0	34	34.0			
The physiological changes that occur in the size of the uterus during the postpartum period	Correct	50	50.0	96	96.0	95	95.0	50	50.0	67	67.0	66	66.0	X^2=0.000 p=1.000	X^2=27.88 p=0.000**	X^2=26.78 p=0.000**
	Incorrect	50	50.0	4	4.0	5	5.0	50	50.0	33	33.0	34	34.0			
The weight of the uterus at the end of postpartum period	Correct	30	30.0	91	91.0	89	89.0	32	32.0	68	68.0	64	64.0	X^2=0.094 p=0.760	X^2=16.22 p=0.000**	X^2=17.38 p=0.000**
	Incorrect	70	70.0	9	9.0	11	11.0	68	32.0	32	32.0	36	36.0			
The physiological changes that occur in the vagina during postpartum period	Correct	45	45.0	94	94.0	90	90.0	42	42.0	70	70.0	67	67.0	X^2=0.183 p=0.669	X^2=19.51 p=0.000**	X^2=21.12 p=0.000**
	Incorrect	55	55.0	6	6.0	10	10.0	58	58.0	30	30.0	33	33.0			
The physiological changes that occur in the perineal area during postpartum period	Correct	42	42.0	96	96.0	95	95.0	45	45.0	70	70.0	69	69.0	X^2=0.183 p=0.669	X^2=23.95 p=0.000**	X^2=22.90 p=0.000**
	Incorrect	58	58.0	4	4.0	5	5.0	55	55.0	30	30.0	31	31.0			
The characteristics of the uterine discharge (lochia) during	Correct	45	45.0	97	97.0	97	97.0	43	43.0	69	69.0	64	64.0	X^2=0.081 p=0.776	X^2=27.78 p=0.000**	X^2=34.68 p=0.000**
	Incorrect	55	55.0	3	3.0	3	3.0	57	57.0	31	31.0	36	36.0			

postpartum period																
The physiological changes that occur in the breast during postpartum period	Correct	39	39.0	91	91.0	91	91.0	31	31.0	76	76.0	71	71.0	**X^2=1.407 p=0.236**	**X^2=8.165 p=0.004****	**X^2=12.99 p=0.000****
	Incorrect	61	61.0	9	9.0	9	9.0	69	69.0	24	24.0	29	29.0			
The change that occurs in body temperature during postpartum period	Correct	52	52.0	100	100.0	95	95.0	50	50.0	81	81.0	79	79.0	**X^2=0.080 p=0.777**	**X^2=20.99 p=0.000****	**X^2=23.46 p=0.000****
	Incorrect	48	48.0	0	0.0	5	5.0	50	50.0	19	19.0	21	21.0			
The change that occurs in respiratory rate during postpartum period	Correct	43	43.0	94	94.0	93	93.0	38	38.0	63	63.0	62	62.0	**X^2=0.519 p=0.471**	**X^2=28.47 p=0.000****	**X^2=27.55 p=0.000****
	Incorrect	57	57.0	6	6.0	7	7.0	62	62.0	37	37.0	38	38.0			
The change that occurs in the pulse rate during postpartum period	Correct	50	50.0	90	90.0	86	86.0	48	48.0	75	75.0	67	67.0	**X^2=0.080 p=0.777**	**X^2=7.792 p=0.005****	**X^2=10.04 p=0.002****
	Incorrect	50	50.0	10	10.0	14	14.0	52	52.0	25	25.0	33	33.0			
The change that occurs in the blood pressure during postpartum period	Correct	45	45.0	96	96.0	93	93.0	46	46.0	67	67.0	63	63.0	**X^2=0.020 p=0.887**	**X^2=27.88 p=0.000****	**X^2=26.22 p=0.000****
	Incorrect	55	55.0	4	4.0	7	7.0	54	54.0	33	33.0	37	37.0			
The physiological changes in body weight that occur during postpartum period	Correct	46	46.0	88	88.0	80	80.0	47	47.0	57	57.0	56	56.0	**X^2=0.020 p=0.887**	**X^2=24.100 p=0.000****	**X^2=25.39 p=0.000****
	Incorrect	54	54.0	12	12.0	20	20.0	53	53.0	43	43.0	44	44.0			
Management of normal puerperium	Correct	43	43.0	90	90.0	89	89.0	38	38.0	64	64.0	59	59.0	**X^2=0.519 p=0.471**	**X^2=19.08 p=0.000****	**X^2=23.38 p=0.000****
	Incorrect	57	57.0	10	10.0	11	11.0	62	62.0	36	36.0	41	41.0			

X^2: Chi-square test. **P:** p-value. No significant at p >0.05. * Significant at p ‹ 0.05. **Highly significant at p ‹ 0.001.

P_1: p value for comparing between two group at **pre-intervention**. **P_2:** p value for comparing between two group at **Post intervention**.

P_3: p value for comparing between two group at **Follow-up phase**.

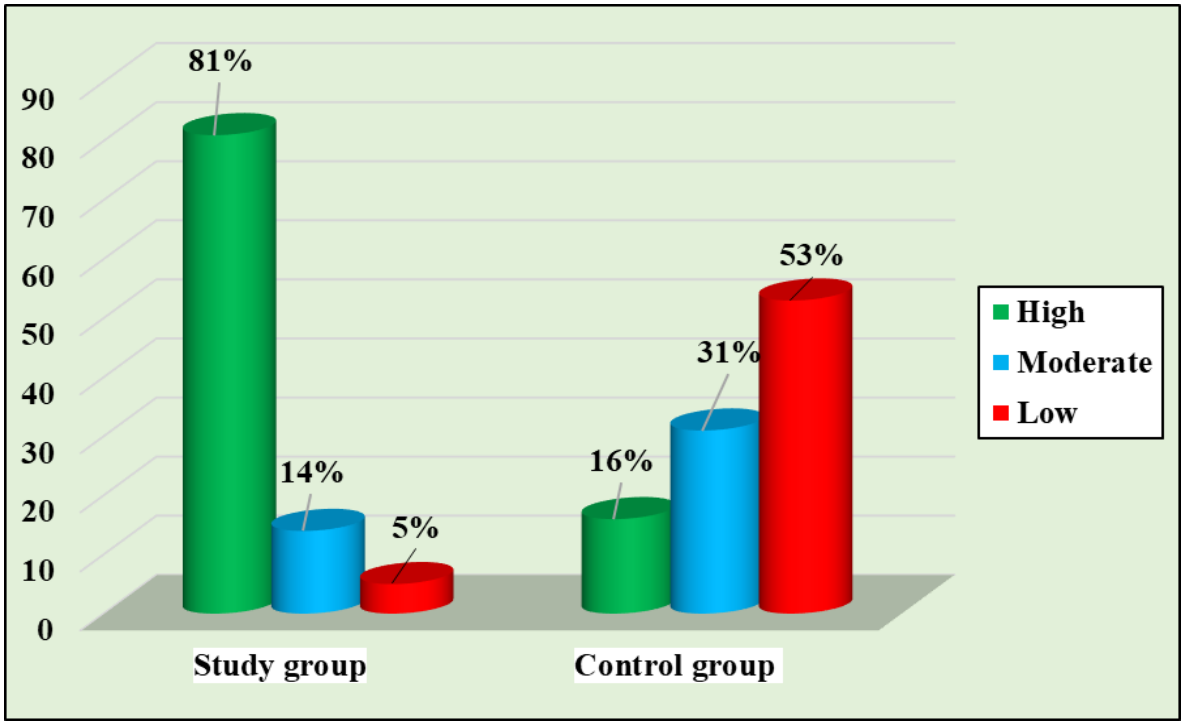

Figure (1): Distribution of the study and control groups total satisfaction and self-confidence score at post intervention phase (n=200).

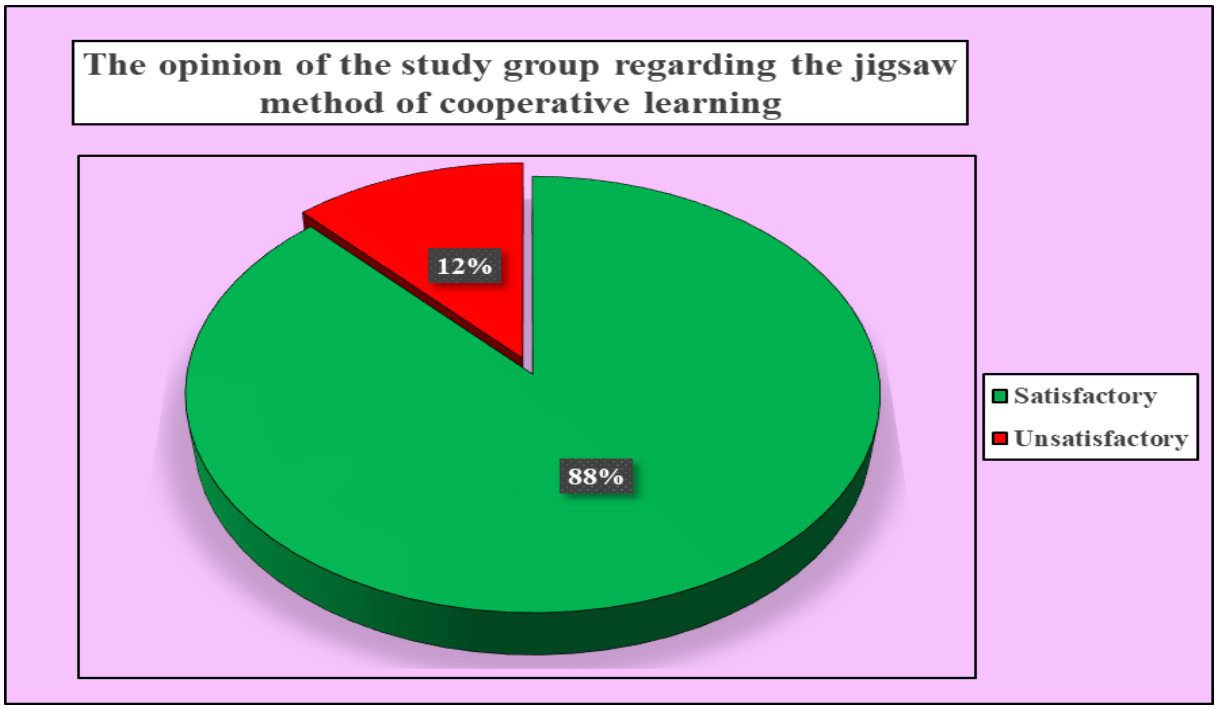

Figure (2): Distribution the study group according to their total opinion scores regarding the jigsaw method of cooperative learning after intervention (N=100).

Table (3): Relation between general characteristics of the studied sample and their total satisfaction and self-confidence at post intervention phase (N=200).

Variables		Total satisfaction and self-confidence of the study group						X^2	P-Value	Total satisfaction and self-confidence of the control group						X^2	P-Value
		High (n=81)		Moderate (n=14)		Low (n=5)				High (n=16)		Moderate (n=31)		Low (n=53)			
		No.	%	No.	%	No.	%			No.	%	No.	%	No.	%		
Age (years)	18- < 19	39	48.1	14	100.0	5	100.0	**16.98**	**0.000****	0	0.0	9	29.0	53	100.0	**72.890**	**0.000****
	19 – 20	42	51.9	0	0.0	0	0.0			16	100.0	22	71.0	0	0.0		
Gender	Male	30	37.0	9	64.3	2	40.0	**3.666**	**0.160**	6	37.5	15	48.4	23	43.4	**0.524**	**0.769**
	Female	51	63.0	5	35.7	3	60.0			10	62.5	16	51.6	30	56.6		
Marital status	Single	72	88.9	11	78.6	5	100.0	**1.921**	**0.383**	14	87.5	25	80.6	46	86.8	**0.673**	**0.714**
	Married	9	11.1	3	21.4	0	0.0			2	12.5	6	19.4	7	13.2		
Place of residence	Rural area	54	66.7	10	71.4	3	60.0	**0.239**	**0.887**	10	62.5	17	54.8	35	66.0	**1.043**	**0.594**
	Urban area	27	33.3	4	28.6	2	40.0			6	37.5	14	45.2	18	34.0		

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

Variables	Total satisfaction and self-confidence after intervention	
	R	P- value
Total opinion regarding the jigsaw method of cooperative learning after intervention	0.846	0.000**

r= Correlation coefficients test. **Highly significant correlation at p ‹ 0.01.

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 that used to facilitate a sustained learning group with interdependent members working towards a specific academic goal under guidance **(Jeppu et al., 2023).**

Jigsaw learning method is a form of cooperative learning method. This approach has been claimed to decrease the competitiveness in the learning environment by encouraging students for cooperative work. Besides, Jigsaw learning method is claimed to enhance more positive student attitudes toward learning, promote more positive relationships between students, develop self-esteem and cohesiveness and improve learning skills **(Crist, 2023).**

The present study aimed to evaluate effect of Jigsaw cooperative learning strategy on student satisfaction and self-confidence in maternity nursing education. The results of the present study were significantly supported the study hypothesis.

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 nearly similar to **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 there were no statistically significant differences regarding socio-demographic characteristics for the studied 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 agreed with **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 matches 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 similar 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 decreasing 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 researcherss point of view** this is due to the fact that the students of the study sample were selected to the same teaching environment and the same educational opportunities, the curriculum for both male and female students had the same activities.

Concerning knowledge of the maternity nursing students in both groups regarding normal pureperium at pre, immediately 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 knowledge regarding normal puerperium at pre-intervention ($P > 0.05$). While, there was a highly statistically significant difference between the study and control groups immediately after intervention ($P < 0.01$). Furthermore, there was a highly statistically significant difference between the study and control group after one month of intervention ($P < 0.01$). Moreover, there was a marked improvement in all knowledge items regarding normal puerperium among the study group after implementation of jigsaw cooperative learning strategy.

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.

This result is supported 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 was no statistical significance difference between study and control groups regarding all knowledge's items related to the second stage of labour before implementation of the Jigsaw learning method ($p > 0.05$). Meanwhile, there was a statistical significance difference between study and control groups regarding all knowledge's items related to the second stage of labour after implementation of the Jigsaw learning method.

Furthermore, this study finding is in consistent with **Ordu and Çalışkan, (2025)** who reported 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.

The current finding is in also in same line with the study carried out by **Aydin and Ince, (2023)** who studied "The Effect of Jigsaw Technique on Nursing Students' Psychomotor Skill Levels and Academic Achievement: A Quasi-Experimental Study" and showed that there was no statistically significant difference between knowledge mean scores of both groups. In the first and second measurements to determine the permanence of knowledge, the mean score of the intervention group was found to be significantly higher compared to the control group ($p < 0.05$).

On the other hand, this result is contradicted with **Stanczak et al., (2022)** who studied "Do Jigsaw Classrooms Improve Learning Outcomes? Five Experiments and an Internal Meta-Analysis" and found that, the Jigsaw intervention did not produce the expected positive effects on learning. This ineffectiveness of this method may pertain to the learners' unfamiliar with this method as well as lack of competence of learners in the implementation of modern learning methods (such as Jigsaw strategy).

Regarding maternity nursing students' satisfaction and self-confidence at post intervention phase for the study and control groups, the present study showed that, there was a highly statistically significant difference between study and control group regarding all items of satisfaction and self-confidence post

intervention ($P < 0.01$). Also, the majority of the study group has high level of satisfaction and self-confidence compared to the minority in the control group.

This study result is supported by **Amr et al., (2024)** who studied "Effectiveness of Jigsaw Teaching Techniques on Surgical Nursing Students'Satisfaction and their Academic Achievement, Egypt", and clarified that most jigsaw group members were quite satisfied with how the jigsaw teaching method was applied. Decision-making and critical thinking skills are enhanced by the jigsaw teaching methodology, which is considered an innovative teaching and learning approach.

Moreover, this result is similar to **Rabea and Farrag, (2025)** who studied "The Effect of Interactive Learning Environment on Maternity Nursing Students' Satisfaction and Self-confidence in The Clinical Setting, Egypt", on 200 third-year maternity nursing students and reported that the students in the study group, who were taught using the jigsaw learning strategy, displayed greater satisfaction and self-confidence compared to students in the control group, who were taught using the traditional method.

Furthermore, the current finding was in same line with **Lin et al., (2025)** who studied "Constructing Learning Confidence Through Jigsaw, Concept Maps and Group Cooperative Learning: A Qualitative Study, Taiwan", and showed that the majority of the students who engaged in cooperative learning through Jigsaw and concept map strategies had been built confidence and improve learning effectiveness spirally, it also helped them in encouraging group participation which serves as a guide to deepen their understanding and retain theoretical knowledge.

Concerning students' opinion regarding Jigsaw learning strategy in study group, the results 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** nursing students can effectively transition from passive to active learners by using the Jigsaw method. Additionally, because cooperative learning increased peer relationships, reduced group conflict and enhance self-esteem.

This result is similar to a study performed by **Mazen et al., (2025)** who showed that more than three quarter of study group had satisfactory opinion regarding Jigsaw learning strategy compared with less than one quarter of students had unsatisfactory opinion regarding Jigsaw learning strategy, also this method enhanced team work cooperation, communication skills, critical thinking skills and self-confidence.

Also, the current finding matches with the study of **Aydin and Ince, (2023)** found that the majority of the nursing students who applied the jigsaw cooperative learning method had been improved critical thinking and clinical decision-making skills, it also positively affected learning attitudes and motivations and enabled students to participate actively in the learning process.

This result is also supported by the study of **Ozkan and Uslusoy (2024),** who studied "Outcomes of Jigsaw Technique in Nurse Education: A Systematic Review and Meta-Analysis, Turkey", and reported that Jigsaw learning technique was an effective method for education; the majority of nursing students had higher interpersonal relations, critical thinking, communication and clinical skills, as well as increasing motivation, self-concept and attitudes such as self-confidence.

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 satisfaction and self-confidence of the study group and their age at post intervention phase ($P< 0.01$). While, there was no statistically significant relation with their gender, marital status and place of residence at post intervention phase ($P= > 0.05$).

This result matches with **Darabi et al., (2025)** who studied "Putting the pieces together: comparing the effect of jigsaw cooperative learning and lecture on public health students' knowledge, performance, and satisfaction, Iran", on 50 public health student and revealed that there was a highly statistically significant relation between satisfaction, self-confidence and total opinion of the study group and age at post intervention phase.

Concerning correlation between total satisfaction and self-confidence of the study group and their total opinion regarding the jigsaw method of cooperative learning after intervention, the present study clarifies that, there was a highly statistically significant positive correlation between total satisfaction and self-confidence 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 revealed that there was an extremely statistically significant correlation between the total satisfaction and self-confidence of the Jigsaw group and their total opinion with cooperative Jigsaw as a learning approach at midterm and final exam.

The effect of Jigsaw learning strategy on clinical achievement.

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:

Based on the result of the current study, it was concluded that the implementation of the Jigsaw learning strategy was effective than traditional teaching method (lecture) in the improvement of maternity nursing students' knowledge regarding normal puerperium. In addition, the implementation of the Jigsaw learning strategy was effective than traditional teaching method (lecture) in the improvement of maternity nursing students' satisfaction and self-confidence. Also, most of students had satisfactory opinion regarding Jigsaw learning strategy. Moreover, there was a highly statistically significant positive correlation between total satisfaction and self-confidence 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 obstetric nursing education.

Further study needs to be performed:

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

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تأثير استراتيجية التعلم التعاوني (چيجسو) على المعلومات والرضا والثقة بالنفس لدي الطلاب في تعليم تمريض الأمومة

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تعد استراتيجية التعلم التعاوني"چيجسو" استراتيجية تعليمية تعاونية بسيطة تُحفِّز علي اهتمام الطلاب بالأنشطة التعليمية والمشاركة الجماعية. الهدف: تقييم تأثير استراتيجية التعلم التعاوني "چيجسو" على المعلومات والرضا والثقة بالنفس لدي الطلاب في تعليم 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 الامومة ، وتم تقسيمهم بالتساوي إلى مجموعتين. أدوات جمع البيانات: استُخدمت أربع أدوات لجمع البيانات وهما: ١) استبيان المقابلة الذاتي، ٢) استبيان التحصيل الدراسي. ٣) استبيان تقييم الرضا والثقة بالنفس. ٤) استبيان تقييم رأي مجموعة الدراسة في استخدام استراتيجية (چيجسو) في التعلم الجماعي النتائج: كشفت نتائج هذه الدراسة أن متوسط درجة معلومات طلاب تمريض الأمومة بفترة النفاس الطبيعية كان أعلى إحصائيًا في مجموعة الدراسة مقارنةً بمجموعة التحكم في مرحلتي ما بعد تطبيق استراتيجية التعلم "چيجسو" والمتابعة. كما وُجد فرق ذو دلالة إحصائية عالية بين المجموعتين الدراسة والتحكم فيما يتعلق بالرضا والثقة بالنفس بعد التدخل. علاوة على ذلك، أبدت أكثر من ثلاثة أرباع مجموعة الدراسة رضاها عن استراتيجية التعلم "چيجسو". الخلاصة: أثبتت استراتيجية التعلم التعاوني "چيجسو" فعاليتها بشكل ملحوظ في تحسين معلومات طلاب تمريض الأمومة والرضا والثقة بالنفس. التوصيات: تطبيق استراتيجية التعلم التعاوني "چيجسو" كأستراتيجية تدريس في مناهج طلاب التمريض.