

## Effect of Jigsaw Learning Strategy on Maternity Nursing Students' Theoretical Achievements

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### Abstract

**Background:** cooperative learning is a form of learning, in which nursing students are actively involved in the teaching-learning process **Aim of this study** is to evaluate the effect of jigsaw learning strategy on maternity nursing students' theoretical achievements. **Sample Type:** simple random sample. **Research design:** Quasi-experimental design was used in this study. **Setting:** at the Faculty of nursing in Kafr-elsheikh University. **Sample size:** Total sample size was one hundred and fifty (150) students. Those students were divided into two groups, control group (75) and study group (75), Data was collected by: **1)** A self-administered questionnaire. **2)** Student's knowledge assessment questionnaire (pre-post-test), and **3)** Students' Opinion Sheet. **Results:** the result of the present study findings revealed that there was a significant difference between both groups regarding the students' theoretical achievements (post & follow up) as students' theoretical achievement scores were higher among study group compared to control group at post and follow up test. **Conclusion:** Jigsaw learning strategy is effective in enhancing maternity nursing students' theoretical achievements. **Recommendations:** apply jigsaw learning strategy as a teaching method in theory and practice of all nursing academic courses.

**Key words:** Jigsaw learning strategy - students' achievement -Maternity Nursing.

### Introduction:

Cooperative learning is one kind of student learning approaches. It has been known throughout the literature as effective in helping students to have effective communication, and proficiency in terms of understanding knowledge, and promoting positive student attitudes towards their learning (Tekdal & Sonmez, 2018).

In order to maintain quality of nursing education, improve cognitive achievement and attitudes of nursing students, teachers are demanded to up to date methods in their teaching plans using innovative methods of teaching. One of these methods is jigsaw strategy (Pourghaznein et al., 2015).

Jigsaw strategies are one of the integrated learning methods that empower students to participate in their learning materials, plan for themselves, lead and present among their peers and motivate each other to

learn. The jigsaw method is a way to learn the course material in a cooperative learning style. This method helps students learn cooperatively as group members in sharing opinions and social skills to complete an assignment (Jainal & Shahrill, 2021).

The use of a jigsaw learning strategy helps students to develop their teamwork skills which can be one of the strategies to build cooperative learning. They found that the implementation of jigsaw has significantly improved students' performance (Chang & Benson, 2020).

Traditional learning is a learning process where both learners and teachers are physically present in the same place at the same time. The process of learning requires direct contact between the educator and the student while the sender here is the educator and the recipient is the student. Face-to-face meeting is the best way to communicate and fix the problem. Universities and other educational institutions to

receive the credential should recognize the challenges that come from the learning environment and improve the capacity to address it through the teacher's guidance (Nguyen, 2015).

In a traditional learning system, the learner is not only trained or graduated but also acquires experience and skills that support in all phases of life. When working with lecturers and friends from all over the world and with diverse backgrounds, cultures, and religions, students developing verbal communication skills (Schulmeister, 2017), and the ability to managing time by attending classes on time and place. The teachers reused the contact hours to encourage students while sharing life experience (Zawacki-Richter et al., 2018).

The main role of nursing education is to train competent and confident nurses with the knowledge, attitude and skills necessary to maintain and promote maternity health. The main purpose of nursing education is to develop critical thinking, creative thinking, reflective learning, professional skills, time management, self-esteem and effective communication (Zeydani, et al., 2021).

#### **Justification of the study:**

The world today needs graduates who can take advantage of their diverse skills and in-depth academic knowledge in order to benefit from professional problem solving and lifelong learning. Hence, nurses encountering fast changes in the system of health care and education systems will realize that they are in a challenging and continually varying complex situations (Qalehsari, 2017).

In faculty of nursing, Kafr El-Sheikh University there is in sufficient application of new learning strategies in professional maternity course. Nursing students should be aware of all theoretical knowledge and practical skills of maternity course to provide competent and effective nursing care. This will lead to improvement of critical thinking skills, problem solving, decision-making skills and increasing the students' memory. In addition to the lack of Egyptian studies that addressed Jigsaw Technique subject in maternity specialty, therefore this study will

be conducted to assess the effectiveness of jigsaw learning strategy on maternity nursing students' theoretical and practical achievements.

#### **Aim of the Study:**

The aim of the current study is to evaluate the effect of jigsaw learning strategy on maternity nursing students' theoretical achievements.

#### **Research hypothesis:**

Jigsaw learning strategy will improve maternity nursing students' theoretical achievements.

#### **Subject and Method**

##### **Research Design**

A quasi-experimental design was used.

##### **Research Setting**

This study was conducted at the Faculty of nursing in Kafr El-sheikh University because it is my workplace.

##### **Sample size:**

Based on statistical calculation the sample size was 150+15 from the pilot study. Students divided into 75 students for each group.

##### **Sample type:**

Simple random sample.

##### **Sample technique:**

The students were numbered and then the researcher chose the odd numbers to form both control and study group.

##### **Sample criteria:**

The sample was selected in the study according to certain inclusion criteria, maternity nursing students who had no previous experience with jigsaw strategy as a teaching method.

##### **Tools of data collection:**

**I)A self-administered questionnaire:** the researcher constructed a questionnaire sheet

after reviewing the related literature. It was used to assess the personal characteristics of the students as: (age, gender, marital status, residence, and previous level of education. It took 15 minutes to be filled by the students.

### II) Student's knowledge assessment questionnaire (pre-post-test):

It was designed by the researcher to assess the students' achievements, it included 20 questions regarding the theoretical part of postpartum minor discomforts. It consists of 13 multiple choice questions and 7 true and false questions regarding postpartum minor discomforts as definition, causes, nursing management. It took 45 minutes to be answered by students.

#### ❖ Scoring system:

Students' knowledge was calculated for each item as follows: correct answer was scored (1 point), while incorrect or no answer was scored (zero point). The total score for all questions related to knowledge was 20 points which represents 100%. Students' achievements in the test was scored according to the operational scoring system at the academic setting in Egypt as follows;

- Excellent: 85% -100%
- Very good: 75% < 85%
- Good: 65% < 75%
- Pass: 60 % < 65%
- Poor: < 60%

### III) Students' Opinion Sheet

It was developed by the researcher based on the related literature to assess the students' opinions related to jigsaw strategy as a learning method among study group. It includes 11 statements with 3 responses agree, uncertain, and disagree.

#### ❖ Scoring system:

**Students' responses were scored as follows:** (1 point) for disagree, (2 points) for uncertain, and (3 points) for agree.

### Content validity and reliability:

These tools were reviewed by jury of 3 experts in the field of maternity and gynecological nursing department. Reliability of tools was done using Alpha coefficient test.

### Ethical consideration:

- The approval was obtained from the Scientific Research Ethical committee in the Faculty of Nursing at Ain Shams University before starting the study.
- The aim of the study was explained to each student and an oral consent to participate was obtained.
- They were given an opportunity to refuse to participate and to withdraw at any stage of the research. There is no harmful occurred to the students.
- Additionally, they were assured that the information will be confidential and used for the research purpose only without any effect on their current at the future academic course assessment.

### Administrative design:

An official approval was obtained from the Dean of the Faculty of Nursing Kafr El-sheikh University, as an approval for data collection through written letter containing the title and the aim of the study.

### Operational design:

### Preparatory phase:

It was started by preparing all information regarding the concept of Jigsaw strategy, the main purpose and technique. The researcher prepared the study material and tools based on recent textbooks, references, research articles, websites, etc. Lecture as a traditional method of teaching was developed for control group. Also, the researcher designed the evaluation tools in this stage.

### Pilot study

A Pilot study was conducted on 10% of the total sample size (15 students) to evaluate the efficiency and content validity of the tool, to find the possible problems that might be faced

during data collection. Students included in the pilot study were excluded from the sample, to avoid sample contamination.

**Implementation phase:**

- Approval of the students was obtained orally after explaining the purpose of the study
- The researcher distributed the self-administered questionnaire to assess the students' personal characteristics (tool I).
- The researcher assessed the students' level of knowledge regarding the theoretical part of postpartum minor discomforts using Pre-test (tool II).
- The researcher informed the students about the time of pre and posttest (Immediate post intervention) and follow up test (after 2 weeks of intervention).

**a.Implementation phase for control group:**

The researcher presented the scientific contents in the form of lecture for control group in one teaching session, its duration was two hours. The lecture was presented for students using power point presentation. The researcher conducted group discussion for all students to clarify any point of contents.

**b. Implementation phase for the study group:**

Implementation Phase for the study group included four teaching sessions through 3 weeks as the **following consequence:**

**Session 1: (orientation Session)**

- The study group attended orientation session for one hour, to be trained on the concept of jigsaw strategy as a teaching method.
- First, the researcher explained in details the jigsaw as a learning strategy including its concept, objectives, steps, and benefits to the students. through oral presentation at the faculty.

**For the theoretical part:**

- The researcher divided students into 12 groups, each group consisted of 6 students. These were the "jigsaw groups"
- A team leader from students was assigned for each group. His function was to facilitate group discussions.
- The study subject (postpartum minor discomforts) were divided into 6 different subtopics including "after pain, breast engorgement, cracked nipple, constipation, urinary retention, and perineal discomfort".
- Each member of the jigsaw groups was assigned for one sub-topic.
- Next, the students who were assigned for the same sub-topics in all the 12 jigsaw groups collected to form "expert groups" as showed in (table 1).
- The students were asked to prepare the subtopics for discussion in their expert group.

**Table (1) Formation of jigsaw groups and expert groups (for theory):**

	jigsaw groups												Topic which taught by jigsaw	
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)		
Expert groups	G1	A1	B1	C1	D1	E1	F 1	G1	H1	I1	J1	K1	L1	1-after pain
	G2	A2	B2	C2	D2	E2	F 2	G2	H2	I2	J2	K2	L2	2-breast engorgement
	G3	A3	B3	C3	D3	E3	F3	G3	H3	I3	J3	K3	L3	3- cracked nipple
	G4	A4	B4	C4	D4	E4	F4	G4	H4	I4	J4	K4	L4	4-constipation
	G5	A5	B5	C5	D5	E5	F5	G5	H5	I5	J5	K5	L5	5-urinary retention
	G6	A6	B6	C6	D6	E6	F6	G6	H6	I6	J6	K6	L6	6-Perineal discomfort

-The researcher suggested resources (textbooks, research articles, websites etc.....), to guide the students and help them in preparing their topics.

- The groups were instructed to prepare the topic well, read them well, and do extra reading.

- The researcher ensured that all information of the prepared subtopics by the students was accurate and it could be corrected before the students started their discussion.

#### **Session 2: (Expert groups discussion)**

The expert groups worked together and discuss their topics. The students shared their additional knowledge with each other's and the researcher clarified any misunderstanding.

#### **Session 3: (jigsaw groups discussion)**

The students returned to their jigsaw group again to present their subtopic to others. Finally, they discussed topics together to improve their thinking ability, cooperation, interaction together, and active learning. The researcher floated between groups and facilitated the whole process.

#### **Session 4:**

The last session was of 2 hours duration during the third week, in which one member from each "jigsaw group" was randomly selected and asked to teach a particular topic to the whole students. The students were also encouraged to ask questions to the presenter if they had any, and the researcher clarified their doubts.

- **Finally, students' Opinion sheet (tool III)** was distributed to assess students' opinions related to jigsaw strategy as a teaching method.

#### **Evaluation:**

- All the students for both groups were assessed for their achievements regarding theoretical part of postpartum minor discomforts through posttest, and follow up test by using tool (II).

- A comparison between two groups (study group and control group) was done to evaluate the effect of two teaching strategies to investigate the research hypothesis.

#### **Statistical design:**

Data entry and statistical analysis were done using the Statistical Package for Social Science (SPSS), version 18.0, a statistical software package. The collected data was analyzed and results were presented in tables and graphics using frequency distribution tables.

#### **Limitations of the study:**

Insufficient Egyptian nursing studies and inadequate references were found regarding applying jigsaw strategy in academic courses.

#### **Results:**

**Table (1):** reveals that 50.7% of the study group their age was 20 years old compared to 34.7% in the control group at the same age. Regarding sex 66.7% of the study group were female versus 61.3% of the control group. Concerning marital status 89.3% were unmarried, the same result as the control group. As regard to previous educational level of the students 73.3% of the study group were from secondary school, the same result as the control group.

**Figure (1):** represents that there was no statistically significant difference between the study group and the control group at pretest.

**Table (2):** illustrates that there were highly statistical significant differences between both groups at follow up test, as the study group achieved higher rate in the excellent grade 68.0% than the control group 40.0%  $p < 0.001^{**}$ , while the study group achieved higher rate in very good grade 25.3% than the control group 9.3%  $p < 0.001^{**}$

**Figure (2):** indicates that there were highly statistical significant differences between both groups at immediately posttest, as the study group achieved higher rate in the excellent grade 64.0% than the control group 26.7%  $p < 0.001^{**}$ , while the study group achieved higher rate in very good grade 30.7% than the control group 17.3%  $p < 0.001^{**}$ .

**Table (3):** represents students' opinions regarding jigsaw learning strategy, they reported that, this method enhanced team work 92%, communication skills and self-confidence 90.7%, It improved critical thinking & decision-

making skills 88%, It helped to develop information management 86.7%, overall satisfaction with this teaching method 84%, It was Effective way of learning and comprehending 82.7, and it facilitated applying knowledge into clinical practice 81.3%.

**Table (4):** represents that there is statistically significant relation between

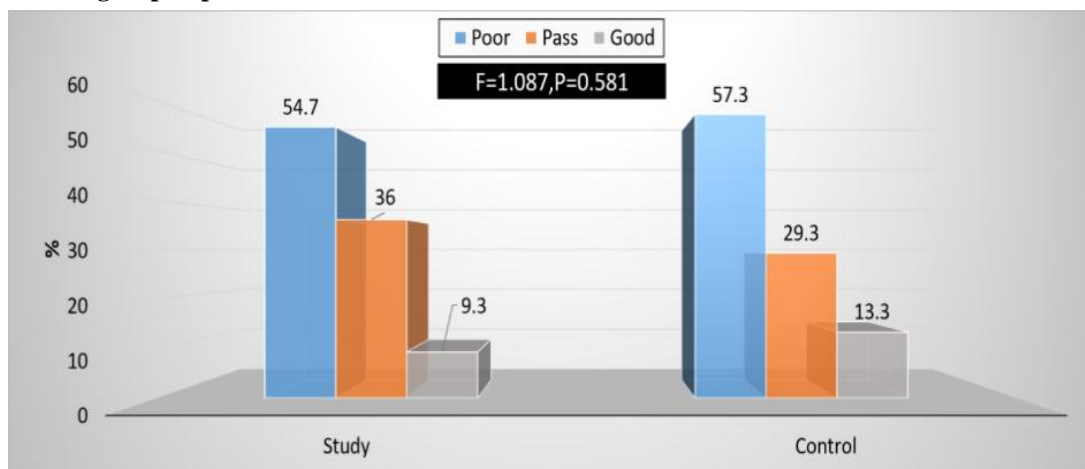
educational level of the students and their theoretical achievements immediately after intervention for the study group.

**Table (5):** shows that that there is highly statistically significant relation between educational level of the students and the students' theoretical achievements at follow up for the study group

**Table (1): Distribution of the students according to their general characteristics:**

Items	Study group (n=75)		Control group (n=75)		Chi-Square test	
	N	%	N	%	X <sup>2</sup>	P
<b>Age (Years)</b>						
19	3	4.0	1	1.3		
20	38	50.7	26	34.7		
21	23	30.7	28	37.3		
22	10	13.3	16	21.3		
23	1	1.3	4	5.3	6.925	0.140
Mean ±SD	20.6 ±0.8		20.7 ±0.9		0.719	0.473
<b>Sex</b>						
Male	25	33.3	29	38.7		
Female	50	66.7	46	61.3	0.463	0.496
<b>Marital Status</b>						
Unmarried	67	89.3	67	89.3		
Married	8	10.7	8	10.7	0.000	1.000
<b>Residence</b>						
Urban	27	36.0	24	32.0		
Rural	48	64.0	51	68.0	0.267	0.605
<b>Educational Level</b>						
Technical school	20	26.7	20	26.7		
Secondary school	55	73.3	55	73.3	0.000	1.000

**Figure (1): Comparison of total Students' achievement between study group and control group at pretest.**

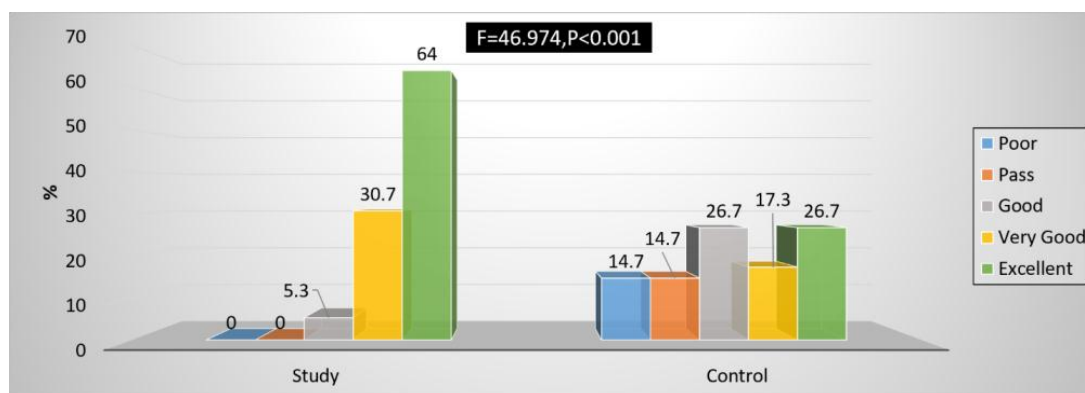


**Table (2): Comparison of total knowledge level between the study group and the control group at immediately after intervention.**

Items	Study group (n=75)		Control group (n=75)		X <sup>2</sup>	P
	N	%	n	%		
<b>Knowledge Level Immediately</b>						
<b>Poor</b>	0	0.0	17	22.7		
<b>Pass</b>	0	0.0	6	8.0		
<b>Good</b>	5	6.7	15	20.0		
<b>Very Good</b>	19	25.3	7	9.3		
<b>Excellent</b>	51	68.0	30	40.0	38.983	<0.001**
<b>Total knowledge score (Mean ±SD)</b>	17.1 ±1.7		14.5 ±3.6		5.623	<0.001**

\*statistically significant differences P<0.05

**Figure (2): Comparison of total Students' achievement between study group and control group at follow up test.**



**Table (3): Number and distribution of Students' opinions regarding jigsaw learning strategy (n=75)**

Items	Disagree		Uncertain		Agree	
	n	%	n	%	N	%
It enhanced communication skill & self confidence	0	0.0	7	9.3	68	90.7
It enhanced teamwork	3	4.0	3	4.0	69	92.0
It increased understanding of the course content	2	2.7	14	18.7	59	78.7
It enhanced retention of knowledge	1	1.3	17	22.7	57	76.0
It improved problem-solving skills	1	1.3	15	20.0	59	78.7
It improved critical thinking & decision-making skills	1	1.3	8	10.7	66	88.0
It helped to develop information management	0	.0	10	13.3	65	86.7
It facilitated applying knowledge into clinical practice	2	2.7	12	16.0	61	81.3
It was Effective way of learning and comprehending	1	1.3	12	16.0	62	82.7
It was Innovative teaching-learning method	1	1.3	28	37.3	46	61.3
Overall, I am satisfied with this teaching method	2	2.7	10	13.3	63	84.0
<b>Total opinion</b>						
Satisfactory opinion		63			84.0	
Unsatisfactory opinion		12			16.0	

**Table (4): Association between general characteristics of the students and knowledge level immediately after intervention for the study group (n=75).**

Items	Good (n=5)		Very Good (n=19)		Excellent (n=51)		Chi-Square test	
	N	%	n	%	N	%	X <sup>2</sup>	P
<b>Age (Years)</b>								
19	0	0.0	1	5.3	2	3.9		
20	4	80.0	10	52.6	24	47.1		
21	1	20.0	7	36.8	15	29.4		
22	0	0.0	1	5.3	9	17.6		
23	0	0.0	0	0.0	1	2.0	4.496	0.810
<b>Sex</b>								
Male	1	20.0	4	21.1	10	19.6		
Female	4	80.0	15	78.9	41	80.4	0.018	0.991
<b>Marital Status</b>								
Unmarried	5	100.0	18	94.7	44	86.3		
Married	0	0.0	1	5.3	7	13.7	1.680	0.432
<b>Residence</b>								
Urban	2	40.0	5	26.3	20	39.2		
Rural	3	60.0	14	73.7	31	60.8	1.037	0.595
<b>Educational Level</b>								
Technical school	5	100.0	18	94.7	32	62.7		
Secondary school	0	0.0	1	5.3	19	37.3	9.193	0.010*

\*statistically significant P&lt;0.05

**Table (5): Association between general characteristics of the students and the students' theoretical achievement at follow up for the study group (n=75).**

Items	Good (n=4)		Very Good (n=23)		Excellent (n=48)		Chi-Square test	
	N	%	n	%	n	%	X <sup>2</sup>	P
<b>Age (Years)</b>								
19	0	0.0	1	4.3	2	4.2		
20	0	0.0	10	43.5	28	58.3		
21	3	75.0	9	39.1	11	22.9		
22	1	25.0	3	13.0	6	12.5		
23	0	0.0	0	0.0	1	2.1	8.027	0.431
<b>Sex</b>								
Male	1	25.0	8	34.8	6	12.5		
Female	3	75.0	15	65.2	42	87.5	4.891	0.087
<b>Marital Status</b>								
Unmarried	4	100.0	21	91.3	42	87.5		
Married	0	0.0	2	8.7	6	12.5	0.741	0.690
<b>Residence</b>								
Urban	1	25.0	7	30.4	19	39.6		
Rural	3	75.0	16	69.6	29	60.4	0.787	0.675
<b>Educational Level</b>								
Technical school	3	75.0	6	26.1	46	95.8		
Secondary school	1	25.0	17	73.9	2	4.2	38.686	<0.001**

\*statistically significant P&lt;0.05



## Discussion:

Using jigsaw learning strategy in modern educational systems will help nursing students to improve their academic achievement, critical thinking skills, problem solving, decision making skills that can be reflected into clinical practice to provide high quality of maternity care (**Abdullah & ABiyikli, 2017**).

Today, jigsaw strategy has an increasing number of applications in an academic level as it encourages students to listen, cooperate and exchange ideas (**Abdel-Mordy, et al., 2022**). Therefore, the present study aimed to evaluate the effect of jigsaw learning strategy on maternity nursing students' theoretical and practical achievements.

The current study revealed that there were no statistically significant differences between both groups regarding their theoretical achievement pre intervention. While there were highly statistically significant differences between both groups regarding their theoretical achievement at post and follow up test, as the study group achieved higher rate in the excellent grade in immediately posttest and follow up exam. From the researcher point of view, 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 study results were in agreement with the study of **Abd ElAliem, et al., (2019)** who conducted a study to evaluate the effect of the utilization cooperative jigsaw learning strategy on maternity nursing students' attitudes and achievements at Faculty of nursing, Benha University. They stated that the jigsaw learning strategy is effective in enhancing maternity nursing students' achievements during maternal and newborn health nursing course.

Similarly, **Abdel-Mordy, et al., (2022)** reported in a study to evaluate the effect of the cooperative jigsaw learning strategy on community nursing students' attitudes and achievements at the faculty of nursing- Benha University that there were statistically significant differences between jigsaw and lecture groups regarding learning achievements

immediately after intervention as  $p\text{-value} \leq 0.05$ , also there were statistically significant differences between both groups in follow up test with  $p\text{-value} \leq 0.001$ , and the jigsaw learning strategy was effective in enhancing community nursing students' attitudes and achievements during geriatric health nursing course.

These similarities between results may be as a result of that students were concerned in preparing lecture's material which helped them to think deeply, let them feel more inspired and encourage them to reflect this knowledge on their care in maternity field easily.

In relation to students' opinions regarding jigsaw strategy, most of the study group reported that, this method enhanced team work, communication skills, critical thinking skills and self-confidence.

In the same line, **Nair et al., (2020)**, who found in a study for evaluation of Jigsaw learning methodology as an active teaching strategy for first year Indian medical students that the students reported they have better student-student interaction, have better interaction with their teachers and acquired better communication skills.

In addition, **Kritpracha, et al., (2018)** performed a study to develop cooperative learning using jigsaw activities for learning achievement and self-directed learning behaviors of master nursing students, and to test the effectiveness of the cooperative learning using jigsaw activities. They stated that jigsaw as a cooperative method enhanced peer interaction, promoted critical thinking skills and team work.

Also, the current study revealed that there is statistically significant relation between educational level and knowledge level of the students after jigsaw. In the same line **Ibrahim, et al., (2020)** in their study to determine the effect of jigsaw cooperative learning strategy on obstetric nurses' knowledge and information retention of emergency contraceptive methods at El Shatby Maternity University Hospital, in Alexandria governorate, Their finding revealed that there was a statistically significant correlation between nurse's knowledge level

about emergency contraceptive and their educational level.

### Conclusion:

The results of the study supported research hypotheses, concluded that Jigsaw learning strategy improves the maternity nursing students' achievement, as students' theoretical achievements scores of minor discomfort during post-partum period topic were higher among study group (jigsaw strategy) than the control group (traditional) at post and follow up test with a statistical significant differences. Additionally, students in the study group had positive opinion regarding the use of jigsaw strategy.

### Recommendations:

- Applying jigsaw learning strategy as a teaching method in all nursing academic courses both theory and practice.
- Further studies should be implemented to assess the effect of jigsaw learning strategy on students' clinical achievement.

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