

# The Effect of Interactive Learning Environment on Maternity Nursing Students' Achievement in the Clinical Setting

Walaa Ashry Rabea<sup>1</sup>, Entesar Fatouh Abd-El Moneim<sup>2</sup>, Rania Abd El-Hak Eid Farrag<sup>3</sup>,  
Neama Abd-El Fattah Abd-El Gawad<sup>4</sup>

<sup>(1)</sup> Assistant lecturer of Maternal and Newborn Health Nursing- Faculty of Nursing Al-Fayoum University, Egypt.

<sup>(2,4)</sup> Professor of Maternal and Newborn Health Nursing, Faculty of Nursing, Helwan University, Egypt.

<sup>(3)</sup> Professor of Maternal and Newborn Health Nursing- Faculty of Nursing Al-Fayoum University, Egypt.

DOI: <https://doi.org/10.5281/zenodo.13626331>

Published Date: 31-August-2024

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**Abstract:** Background The jigsaw method is away to learn the course material in a cooperative learning style. jigsaw can affect positively on both the nursing students and clinical nurse educators. Aim of the study: was to investigate the effect of an interactive learning environment using the jigsaw method on maternity nursing students' achievement in the clinical setting. Research design: This study used a quasi-experimental research design. Setting: The study was conducted at the Maternal and Neonatal Health Nursing Department, Faculty of Nursing, Al-Fayoum University in Egypt. Subjects: A convenient sample of 200 third-year maternity nursing students was recruited and divided into two groups: a control group of 100 students and a study group of 100 students. Tools: Three tools were used for data collection in the present study. Tool I: A Structured interviewing questionnaire: Included demographic data as; age, gender, and previous educational level. Tool II: The students' achievement scale Tool III: Cooperative Jigsaw Opinion Scale. Results: The findings showed a statistically significant difference between the two groups, with the study group (exposed to the jigsaw learning strategy) achieved higher scores compared to the control group. Conclusion: The study concluded that the jigsaw learning strategy significantly improves maternity nursing students' academic achievement also it was found that maternity nursing students had positive feedback about Jigsaw learning strategy after its application. Recommendation: The study recommends applying the jigsaw learning strategy as a teaching method in all nursing academic courses, both theory and practice. Further Research: Assess The factors that may influence the success of the Jigsaw approach in diverse educational settings, particularly in nursing education.

**Keywords:** Jigsaw learning strategy – Maternity nursing students - Students' achievement.

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## 1. INTRODUCTION

Nursing education aims to foster the development of critical thinking, creative thinking, reflective learning, professional skills, time management, self-esteem, and effective communication. The primary goal of maternity nursing education is to develop competent, self-assured nurses with the knowledge, attitudes, and abilities to sustain and advance maternal and child health (Rashed et al., 2023).

The clinical learning environment is an interactive society comprising students, instructors, healthcare team members, patients, and peers. This environment prepares nursing students to adopt the nursing role and provides professional

**International Journal of Novel Research in Healthcare and Nursing**Vol. 11, Issue 2, pp: (285-297), Month: May - August 2024, Available at: [www.noveltyjournals.com](http://www.noveltyjournals.com)

development. A successful clinical learning environment is characterized by high-quality patient care, a positive team climate, active student learning experiences, and supportive instructor relationships. This can be achieved through the use of active learning strategies (*Towfik et al., 2023*).

However, the current state of Obstetrics and Gynecology clinical nursing education predominantly follows the traditional lecture-based learning (LBL) approach. This model emphasizes teaching as the fundamental component, where clinical supervisors impart professional knowledge while nursing students are expected to simply listen, observe, and imitate. In this approach, the clinical supervisors are the active participants, while the nursing students remain passive, lacking the opportunity to stimulate clinical thinking or cultivate their ability to ask questions (*Li & Zhu, 2024*).

As a result, educational institutions are moving towards more interactive teaching methods, moving away from the traditional lecture-based approach where the teacher is active and the students are passive, which can lead to a lack of understanding. Currently, institutes are adopting various interactive teaching methodologies to engage students and improve academic performance. Cooperative learning (CL) is one such effective, task-oriented approach that can enhance students' knowledge and capabilities (*Ghouri et al., 2022*).

**Also, to improve student learning achievement**, teachers should be able to choose and apply a learning model that is effective in improving students' thinking abilities, one of which is through the use of the Cooperative Learning Model. One variation of the technique of the Cooperative Learning Model is the Jigsaw technique. Cooperative Learning Model Jigsaw technique is a learning technique where students are grouped heterogeneously as many as 4-6 people to collaborate in completing the learning material given by the teacher as their group assignment, where each student has responsibility for their respective tasks and is obliged to explain the results. group collaboration with other groups (*Triansyah, et al., 2023*).

The jigsaw technique is a cooperative learning strategy where learners with different abilities join a group called the home group. Each member in the home group is responsible for studying different topics and then moving to a new group on the same topic, called the expert group. When the expert group has successfully worked together, they will move back to the original group, which is their home group, to bring the knowledge gained from discussions in the expert groups to summarize it for the home group, and then the teachers test and give scores (*Safkolam et al., 2023*).

The jigsaw strategy is like a puzzle that brings together students of diverse abilities, ethnicities, races, and genders in a collaborative effort to solve a complex problem. It's like a recipe that blends all the necessary ingredients to create a delicious dish. In the jigsaw method, students work cooperatively in a supportive environment, relying on each other to succeed. This approach allows students not only to learn the subject matter but also to develop valuable skills such as teamwork, communication, and critical thinking (*Adam et al., 2023*).

**SIGNIFICANCE OF THE STUDY:**

The dominant educational method at most universities is in the form of a lecture that 80% of educational content is forgotten within 8 weeks. Teachers like to use lectures because the applicability in large classes or due to a large number of educational topics or limited time. However, lecture is the one-way teaching and can quickly become boring and prevent the effective learning of students. The presence of qualified, competent, cooperative and interactive learning methods for maternity nursing students will make them deliver high quality maternity care, where nurses can be invaluable in preventing harm to mothers and improving the pregnancy outcomes. All of that requires obtaining high levels of knowledge and skills during the nursing academic period as the world today needs graduates who think critically and apply skills in complex patient care situations. (*Abd El Aliem., et al 2019*)

Therefore, the demands for changing the traditional teaching strategies have escalated in the last decades to enable the learners to cope with these challenges and applying new teaching methods to improve critical thinking skills, problem-solving and widely acknowledge the students. That will be reflected in students' achievements and satisfaction and subsequently on the rank of the faculty among the other nursing faculties. Considering the lack of Egyptian studies that addressed jigsaw strategy in maternity specialty, therefore this study will be conducted to evaluate the effect of the utilization of cooperative jigsaw learning strategy on maternity nursing students' achievements, self-confidence and satisfaction.

## International Journal of Novel Research in Healthcare and Nursing

Vol. 11, Issue 2, pp: (285-297), Month: May - August 2024, Available at: [www.noveltyjournals.com](http://www.noveltyjournals.com)

### AIM OF STUDY:

This study aimed to investigate the effect of an interactive learning environment on maternity nursing students' achievement in the clinical settings.

### RESEARCH HYPOTHESIS:

This study hypothesized that an interactive learning environment has positive effect on maternity nursing students' achievement than traditional teaching methods.

## 2. SUBJECTS AND METHODS

### RESEARCH DESIGN:

This study employed a quasi-experimental research design.

### SETTING:

The study was conducted at the Maternal and Neonatal Health Nursing Department, Faculty of Nursing, Al-Fayoum University, Egypt.

**TYPE OF SAMPLE:** A convenient sample of 200 nursing students was recruited from the Maternal & Neonatal Health Nursing in faculty of nursing, Al Fayoum university in which categorized into two groups as the following:

**1<sup>st</sup> group” control group”** included all nursing students (100 students) in maternity and neonatal health nursing course in the second semester for the academic year (2022-2023) and those were already subjected to traditional educational method during labor clinical area at the lab.

**2<sup>nd</sup> group “study group”** included all nursing students (100 students) in maternity and neonatal health nursing course in the first semester for the academic year (2023-2024) and those were already subjected to utilize cooperative jigsaw learning strategy during labor clinical area at the lab.

### TOOLS FOR DATA COLLECTION:

Three tools were used for data collection in the present study

#### Tool I: Structured Interviewing Questionnaire:

Developed by the researcher to evaluate students' personal characteristics, such as age, gender, residence, and previous level of education It took 5 minutes to be filled by students.

#### Tool II: The students' achievement scale:

Clinical area evaluation sheet to assess students' achievement for both groups and contained two main parts as the following:

##### Part (1): The observational checklists:

The observational checklists (The researcher used the formal checklist of the department to assess the practical part for the following skills; management of the second stage of labor, management of the third stage of labor and placental examination and immediate neonatal care).

##### Part (2): clinical written test:

covered theoretical and clinical objectives.

#### Scoring system for Tool II:

The students' achievement was scored and categorized as follows:

- (1) Excellent: 85 %up to 100%
- (2) Very good: from 75 % to less than 85%

**International Journal of Novel Research in Healthcare and Nursing**

Vol. 11, Issue 2, pp: (285-297), Month: May - August 2024, Available at: [www.noveltyjournals.com](http://www.noveltyjournals.com)

- (3) Good: from 65 % to less than 75%
- (4) Fair: from 60% to less than 65%
- (5) Poor less than 60 %

The scoring system was according to the operational scoring system at the academic setting in Egypt

**Tool III: Cooperative Jigsaw Opinion Scale (CJOS):**

Adapted from **Abdel-Mordy et al. (2022)** to assess the study group's opinions about the jigsaw method of interactive learning, at the end of the study. It included 14 statements, positive (score 1) or negative (score 0) opinions.

In addition to a handout material for the study group to describe jigsaw strategy as a teaching method.

**Supportive material:**

"The booklet provided to the study group included instructions on the Jigsaw strategy as a teaching method. It covered the concept, objectives, advantages, and steps of the Jigsaw strategy. The researcher created this booklet by reviewing relevant literature and adapting content from sources such as (*Anderson et al.,2022; Nasrabadi et la.,2021 & Tinmaz & Ozturk, 2022*) The purpose of this booklet was to help the students in the study group who would be applying the Jigsaw teaching technique to increase their level of understanding about the Jigsaw technique and how to effectively implement it. "

**VALIDITY AND RELIABILITY:**

The data collection tools were reviewed by a panel of three experts in maternal and newborn health nursing field to test the face and content validity. Each of the experts was asked to examine tools for content coverage, relevance, understanding, comprehensiveness, wording, length, format and overall appearance. Modification was done based on the comments. Cronbach Alpha coefficient test was used to measure the internal consistency of the tools used in the current study.

**ETHICAL CONSIDERATION:**

An official permission to conduct the proposed study was obtained from the Scientific Research Ethics Committee Faculty of Nursing Helwan University (25-8-2022). The study methodology is safe for the students, and the media used in the study is related to the subject and built on scientific and ethical considerations. As well, the study environment motivates productive learning and the students announced their approval to participate

**PREPARATORY PHASE:**

Review was done of the current, local and international related literature about various aspect of the problem using books, periodicals journal, magazines and internet Then the tools were reviewed by jury doctors Then tools were tested for being feasible and applicable through a pilot study

**PILOT STUDY:**

The total sample size was (200) students and the pilot study was done on 10% of the sample (20) Pilot study was done to examine the clarity of questions and feasibility and applicability of the tools and the time needed to complete the study tools. Based on the results, no modifications done so subjects included in the pilot study included in the sample.

**FIELD WORK:**

The study was conducted over the course of one year, from February 2023 to January 2024, during which relevant data was collected. Data collection occurred twice a week, from 9:00 a.m. to 2:00 p.m., for two weeks per rotation. The study was carried out in three phases: planning, implementation, and evaluation.

**Assessment and Planning Phase**

This phase began with gathering information on the jigsaw teaching strategy, the main objectives, and the techniques involved. Study materials and tools related to labor competencies were developed based on textbooks, research articles, websites, and other references.

**International Journal of Novel Research in Healthcare and Nursing**

Vol. 11, Issue 2, pp: (285-297), Month: May - August 2024, Available at: [www.noveltyjournals.com](http://www.noveltyjournals.com)

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

- The control group consisted of 100 second-term maternity nursing students in 2022-2023 academic year, who received traditional teaching on the labor clinical area at the lab.
- The researcher first introduced herself and explained the study's purpose
- The researcher communicated the study's objectives to the participants regarding clinical competencies in the labor area.
- The students were divided into four groups, each consisting of 25 students, for two weeks, twice a day per week (9 am - 2 pm).
- The researcher presented the topics and procedures of the area using the traditional teaching method with the control group, followed by group discussions to clarify any content points.
- At the beginning of the area, the students completed the Structured Interviewing Questionnaire Tool (I). At the end of the area, the researcher completed the Students' Achievement Scale (Tool II)

**B. Implementation phase for study group:**

- The study group consisted of 100 first-term maternity nursing students in the 2023-2024 academic year, who received jigsaw learning on the labor clinical area at the lab with each rotation including four sessions.
- Implementation Phase for the study group included four teaching sessions through 2 weeks as the following consequence:

**Session 1: Orientation:**

- The students attended a one-hour orientation session one day before the clinical days.
- During the session, the researcher introduced the jigsaw strategy, including its advantages, steps, and importance, and distributed information booklets to the students.
- The researcher also provided an overview of the labor competency subtopics to be addressed and explained the students' roles for the following day.
- At the beginning of the labor area, the researcher administered the Structured Interviewing Questionnaire (Tool I) to the students.
- The labor area topics and procedures were divided into 5 different subtopics (pieces).
- The class of 25 students was divided into 5 heterogeneous home groups (A, B, C, D, and E) of 5 students each, considering academic achievement levels and gender diversity and assigned a team leader and recorder for each group.
- Each student in the home groups was assigned a specific subtopic to study and prepare.
- Subtopics were assigned to individual students in the home group, and relevant study material was provided. For instance, A1 was tasked with explaining the Definition of Key Terms Related to Labor Area, Factors Affecting Labor, Signs of True Labor, The Difference Between True and False Labor Pain, and Premonitory Signs of Labor. The same task was assigned to B1, C1, D1, and E1 in other home groups.
- The second task was given to A2, B2, C2, D2, and E2, and it included the nature, the phases, the characteristics and the importance of uterine contractions, and the stages of labor.
- The third task was given to A3, B3, C3, D3, and E3, and it included phases of the first stage of labor, signs of the second stage of labor, mechanism of labor, signs and mechanisms of placental separation.
- The fourth task was given to A4, B4, C4, D4, and E4, and it included nursing management of the first stage of labor.
- The fifth task was given to A5, B5, C5, D5, and E5, and it included the nursing management during the second and third stages of labor, placental examination, and immediate neonatal care. This was the only group that presented their task to the whole group once by roleplay.

**International Journal of Novel Research in Healthcare and Nursing**

Vol. 11, Issue 2, pp: (285-297), Month: May - August 2024, Available at: [www.noveltyjournals.com](http://www.noveltyjournals.com)

**Session 2: Expert Group Discussion**

- Students with the same assigned subtopic from different home groups formed "expert groups" to discuss, share responses, and ensure the accuracy of the information.
- The researcher suggested resources (textbooks, research articles, websites, etc.) to guide the students and help them in preparing their topics.
- The researcher ensured that all information of the prepared subtopics by the students was accurate and could be corrected before the students started their discussion.
- The researcher ensured that each student fully participated in preparing and mastering their assigned task, becoming a true "expert" on that content area.

**Session 3: Jigsaw Group Discussion**

- Each member in the expert groups returned to their original home group and presented their assigned subtopic to the other members.
- The researcher observed the process and intervened if any group was having trouble (e.g., a member was dominating or disruptive).

**Session 4: Evaluation**

- At the end of the labor area, the researcher completed the Students' Achievement Scale (Tool II), and the Cooperative Jigsaw Opinion Scale (Tool III) with the study group.

**Evaluation Phase:**

- The achievement levels of students in both the control group and the study group were evaluated. The impact of the two instructional styles (traditional and jigsaw) was then compared to test the research hypotheses.

**Administrative Consideration:**

An official letter to conduct the study was obtained from the responsible authorities at the Faculty of Nursing Helwan University and was directed to the dean of faculty of nursing and to the head of maternity and neonatal nursing department Al Fayoum university for conducting the study

**Statistical Analysis:**

The collected data were revised, coded, and Statistical presentation and analysis were conducted using the Statistical Package for Social Science (SPSS) version 25. Data were presented using descriptive statistics in the form of frequencies and percentage for categorical data, the arithmetic mean ( $\bar{X}$ ) and standard deviation (SD) for quantitative data. chi-square test was used to compare between groups in qualitative, linear correlation coefficient was used for detection of correlation between two quantitative variables in one group.

**Degrees of significance of results were considered as follows:**

- P-value  $> 0.05$  Not significant (NS)
- P-value  $\leq 0.05$  Significant (S)
- P-value  $\leq 0.01$  Highly Significant (HS).

**3. RESULTS**

**Table (1):** This table showed the demographic characteristics of the studied students. It was found that there was no statistical significance difference regarding sociodemographic characteristics except for age; the mean age among the study and control group was  $(20.9 \pm 0.67)$  &  $(21.5 \pm 0.64)$  respectively. Regarding gender 60% of the control group were males versus 58% in study group. In addition, 70% of the control group graduated from secondary school versus 60% among study group.

**International Journal of Novel Research in Healthcare and Nursing**

Vol. 11, Issue 2, pp: (285-297), Month: May - August 2024, Available at: [www.noveltyjournals.com](http://www.noveltyjournals.com)

**Table (2):** The table illustrated that the study group achieved higher rate in excellent grades in the management of the second stage of labor, the management of the third stage and the placental examination and the immediate neonatal care checklists (73%,78%,75%, respectively) than the control group (42%,35%,39% respectively).

**Figure (1):** It was illustrated from the figure the Comparison between control and study groups regarding their total achievement scores. The results indicated that the study group did better than the control group with higher percentage of excellent degree among study group 74% versus 40% in control group.

**Table (3):** The table illustrated that there was a statistical significance difference between control and study group as regards students’ total achievement score, with higher percentage of excellent degree among study group 74% versus 40% in control group with p-value <0.001

**Table (4):** The table illustrated the study groups' opinions regarding jigsaw learning strategy, all the students reported that the jigsaw teaching method enhanced their communication skills and self-confidence (100%) Additionally, (99%) of the students felt that the jigsaw strategy improved their critical thinking and decision-making abilities. Similarly, (99%) of the participants stated that the jigsaw approach facilitated the application of their knowledge into clinical practice. overall satisfaction with this teaching method was (98%), also (98%) of the students recommending the application of the jigsaw strategy as a teaching approach in other nursing courses.

**Table (5):** The table illustrated that among study group there was no statistical significance difference between different achievement degrees in age, gender, residence and previous educational level with p-value >0.05.

**Table (6):** The table illustrated that among control group there was a statistical significance higher percentage of excellent and very good grade were female (p-value 0.01), and significant higher percentage of excellent and very good grade among students with secondary educated with p-value 0.03 with no difference in residence with p-value >0.05.

**Table (1): Distribution of the studied students according to their demographic characteristics (n= 200).**

Variables	Control group (n=100)		Study group (n=100)		Test	p-value
	Mean ±SD		Mean ±SD		t-test	
Age (years)	21.5±0.64		20.9±0.67		6.1	<0.001
Sex	No.	%	No.	%	X <sup>2</sup> test	
Male	60	60%	58	58%	0.08	0.88
Female	40	40%	42	42%		
Residence						
Rural	58	58%	66	66%	1.4	0.31
Urban	42	42%	34	34%		
Previous Education level						
Secondary	70	70%	60	60%	2.2	0.18
Technical institute of nursing	30	30%	40	40%		

**Table (2): Comparison between control and study groups regarding their procedure’s grades in labor clinical area. (n= 200)**

Specified Nursing Procedure	Percentage of achievement levels among control and study group							
	Control group n=100				Study group n=100			
	Excellent	Very good	Good	Fair	Excellent	Very good	Good	Fair
Management of Second Stage of Labor	42	25	22	11	73	22	4	1
Management of Third Stage of Labor and Placental Examination	35	33	17	15	78	13	6	3
Immediate Neonatal Care	39	25	27	9	75	21	3	1

International Journal of Novel Research in Healthcare and Nursing

Vol. 11, Issue 2, pp: (285-297), Month: May - August 2024, Available at: [www.noveltyjournals.com](http://www.noveltyjournals.com)

Table (3): Comparison between control and study groups regarding their total achievement (n= 200)

Achievement grade	Control group (n=100)		Study group (n=100)		X <sup>2</sup> test	p-value
	No.	%	No.	%		
Excellent	40	40%	74	74%	30.9	<0.001
Very good	29	29%	21	21%		
Good	23	23%	5	5%		
Fair	8	8%	0	0%		

Figure (1): Comparison between control and study groups regarding their total achievement (n=200)

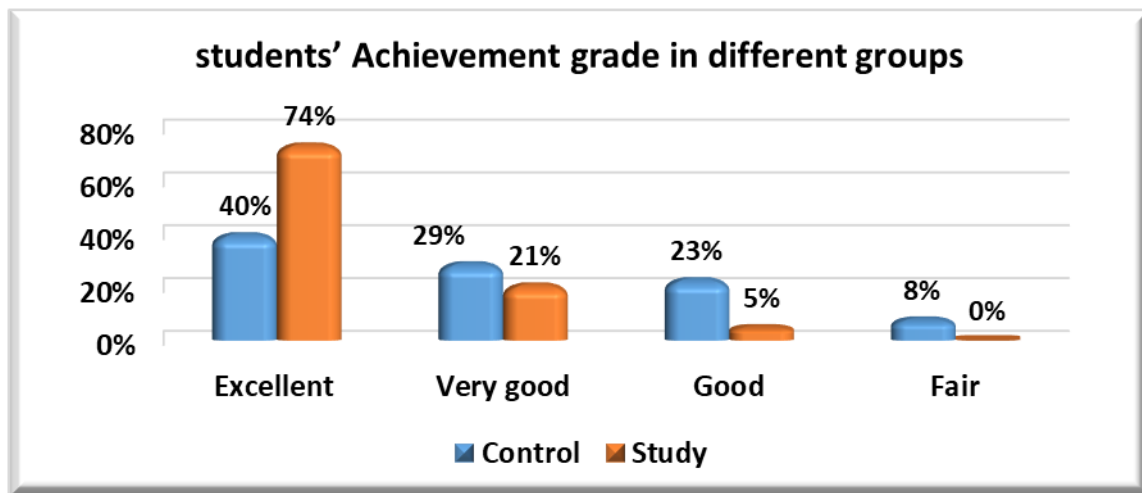


Table (4): Description of the Students' Cooperative Jigsaw Opinion among study group. (n=100).

Cooperative Jigsaw Opinion items	Positive	Negative
	%	%
jigsaw learning strategy made the clinical course content easy for us to understand	96%	4%
It ensured the correction of our misinformation	91%	9%
It made us learn better	97%	3%
It increased the possibility of the teacher's interested in each student	96%	4%
The dependence of the students upon the teacher was lessened	95%	5%
It enhanced communication skills & self-confidence	100%	0%
It enhanced teamwork cooperation	96%	4%
Everyone in the group shared responsibility	94%	6%
It made the ideas within the group to be discussed more positively	97%	3%
It improved critical thinking & decision-making skills	99%	1%
It facilitated applying knowledge into clinical practice	99%	1%
It was the innovative teaching learning method	96%	4%
Over all I am satisfied with this teaching method	98%	2%
I recommend applying jigsaw strategy as a teaching method in other nursing courses " (theory & practice).	98%	2%



International Journal of Novel Research in Healthcare and Nursing

Vol. 11, Issue 2, pp: (285-297), Month: May - August 2024, Available at: [www.noveltyjournals.com](http://www.noveltyjournals.com)

Table (5): Comparisons of demographic characteristics in Students' achievement degree among study group.

Variables	Achievement degree			Test	p-value
	Excellent	V. Good	Good		
	Mean ±SD	Mean ±SD	Mean ±SD	F-test	
Age (years)	20.9±0.66	20.9±0.73	21.2±0.84	0.52	0.59
Sex	No.	%	No.	X <sup>2</sup> test	
Male	43(58.1%)	11(52.4%)	4(80%)	1.3	0.53
Female	31(41.9%)	10(47.6%)	1(20%)		
Residence					
Rural	48(64.9%)	14(66.7%)	4(80%)	0.48	0.78
Urban	26(35.1%)	7(33.3%)	1(20%)		
Education level					
Secondary	41(55.4%)	17(81%)	2(40%)	5.3	0.07
Technical institute of nursing	33(44.6%)	4(19%)	3(60%)		

Table (6): Comparisons of demographic characteristics in Students' achievement degree among control group.

Variables	Achievement degree				Test	p-value
	Excellent	V. Good	Good	Fair		
	Mean ±SD	Mean ±SD	Mean ±SD	Mean ±SD	F-test	
Age (years)	21.6±0.66	21.3±0.60	21.5±0.67	21.4±0.52	1.9	0.12
Sex	No.	%	No.	No.	X <sup>2</sup> test	
Male	19(47.5%)	16(55.2%)	17(73.9%)	8(100%)	10.1	0.01*
Female	21(52.5%)	13(44.8%)	6(26.1%)	0(0%)		
Residence						
Rural	23(57.5%)	14(48.3%)	17(73.9%)	4(50%)	3.7	0.29
Urban	17(42.5%)	15(51.7%)	6(26.1%)	4(50%)		
Education level						
Secondary	24(60%)	24(82.8%)	14(60.9%)	8(100%)	85	0.03*
Technical institute of nursing	16(40%)	5(17.2%)	9(39.1%)	0(0%)		

#### 4. DISCUSSION

Innovative teaching methods and strategies should be used, especially in nursing and health education programs, in line with students' needs. Research has shown that compared to traditional learning methods, active structuring approaches facilitate learning and skill development in nursing educations. The Jigsaw technique is a modern method that enables the creation of a positive learning environment dominated by individual accountability. Previous research on the usage of the Jigsaw technique in health education has shown that this method enhances the self-confidence, communication skills and academic success of students (Ziyai & Dikmen, 2022).

The aim of this study was to investigate the effect of an interactive learning environment using the jigsaw learning strategy on maternity nursing students' achievement.

The findings of this study clearly demonstrate the positive impact of the Jigsaw learning strategy on students' academic achievement. The results reveal a statistically significant difference in the achievement levels between the control and study groups, with a substantially higher percentage of students in the study group attaining excellent grades compared to the control group. Specifically, nearly three-quarters of the students in the study group achieved excellent final grades, while only slightly more than one quarter of the control group students reached this level of performance.

These findings are consistent with numerous other studies that have explored the effectiveness of the Jigsaw approach across various scientific disciplines. For instance, the study of Rashed et al. (2023), which examined the Effect of Jigsaw Learning Strategy on Nursing Students' Understanding of Normal Labor Concept at the Faculty of Nursing, Sohag University,

**International Journal of Novel Research in Healthcare and Nursing**Vol. 11, Issue 2, pp: (285-297), Month: May - August 2024, Available at: [www.noveltyjournals.com](http://www.noveltyjournals.com)

reported a highly statistically significant improvement in academic achievement following the implementation of the Jigsaw technique.

Furthermore, a study conducted in Saudi Arabia by **Uzma et al. (2021)** on the use of the Jigsaw classroom model in a clinical pharmacology course also found that students performed better on test items related to the content delivered through the Jigsaw approach compared to the traditional lecture format.

These positive findings are further corroborated by study conducted in Oman by **Renganathan (2020)** in a study at Oman Nursing Institute, Muscat, which indicated that the Jigsaw puzzle method effectively improved students' academic scores and facilitated effective learning in nursing students. **Smitha et al. (2023)** also found a significant achievement difference favoring the experimental (Jigsaw) group over the control (traditional) group in a study conducted with fourth-year B.Sc. Nursing students in India.

Similar positive findings have been reported in the study conducted by **Aydin & Ince (2023)**, which involved 98 first-year undergraduate nursing students in Turkey. This study examined the effect of using the Jigsaw Technique (JT) on first-year nursing students' psychomotor skill levels and academic achievement in the context of local drug applications. The results showed that the study group, significantly outperformed the control group. Specifically, the laboratory and OSCE (Objective Structured Clinical Examination) evaluation scores, as well as the follow-up knowledge test scores, were found to be substantially higher for the students in the Jigsaw-based intervention group compared to their counterparts in the control group.

From the researcher's point of view, these findings further corroborate the effectiveness of the jigsaw collaborative learning approach in enhancing both the practical skills and theoretical understanding of nursing students. and can positively impact the academic success of nursing students, highlighting its potential as an engaging and effective teaching strategy within the nursing curriculum.

The researcher attributes these positive results to the Jigsaw learning strategy's ability to facilitate critical thinking skills, encourage the expression of different thoughts, improve communication skills, and create an interactive environment that enhances students' interest and understanding. However, it is important to note that the effectiveness of this approach depends on the presence of a competent teacher who can effectively guide, organize, and motivate students to develop a comprehensive knowledge base.

It is worth noting that not all studies have found consistently positive results. For instance, **Ghuri et al. (2022)** reported no significant difference between traditional and Jigsaw-based cooperative learning in achievement. However, the researchers noted that despite the lack of difference in achievement outcomes in that study, the students who experienced the jigsaw method still expressed that they enjoyed the cooperative learning technique.

The researcher attributed this disagreement in findings to the students' continuous familiarity and comfort with the traditional lecture-based instructional model. The researcher suggested that the students' prior exposure and customization to the conventional teaching approach may have influenced their performance and limited the comparative advantages of the jigsaw method.

Regarding students' opinions on the cooperative Jigsaw learning strategy, all the study group members stated that jigsaw strategy improved their communication skills and self-confidence. Furthermore, the majority of them reported that the Jigsaw learning strategy improved their critical thinking and decision making skills and facilitated applying knowledge to clinical practice and overall satisfaction and they recommended applying the Jigsaw strategy as a teaching method in other nursing courses, both in theory and practice.

This result is in harmony with a published study conducted at the Faculty of Nursing, Banha University, during the course on community health nursing. The study, titled "Role of Jigsaw method of teaching in improving clinical diagnosis among final year medical students – A prospective observational study," by **Abdel-Mordy et al. (2022)**, revealed similar findings. The study group participants stated that the Jigsaw strategy improved their critical thinking and decision-making skills, and that the Jigsaw learning strategy enhanced teamwork and cooperation. Additionally, the participants recommended applying the Jigsaw strategy as a teaching method in other nursing courses, both in theory and practice.

## International Journal of Novel Research in Healthcare and Nursing

Vol. 11, Issue 2, pp: (285-297), Month: May - August 2024, Available at: [www.noveltyjournals.com](http://www.noveltyjournals.com)

The present finding is also supported by a study conducted by **Abobaker et al. (2023)** in Saudi Arabia, titled "Impact of Jigsaw Cooperative Learning Strategy on Nursing Students' Academic Achievement and Opinions." This published study reported that the majority of students agreed that "JLS improved problem-solving skills" and "JLS was an innovative teaching-learning technique." Additionally, most of the students stated that "JLS improved teamwork." The study participants also recommended the application of the Jigsaw strategy as a teaching method in further nursing courses.

This result was in harmony with Study conducted in India by **Appandraj et al. (2021)** revealed that the majority of students agreed or strongly agreed that the jigsaw method helped them learn better, covered a wide range of knowledge, improved communication skills, improved confidence, and enhanced clinical reasoning.

From the researchers' perspective, the above results indicate that the Jigsaw learning strategy enhances achievement and educational outcomes by fostering critical thinking abilities, enabling the articulation of diverse student viewpoints, improving communicative competencies, decision making and establishing an interactive environment that encourages active participation and profound comprehension.

Concerning the relationship between achievement and gender, the present study revealed no statistical significance difference between different achievement levels and gender in study group. However, in the control group, there was a statistically significant higher percentage of female students achieving excellent and very good grades. This result aligns with the study conducted by **El-Refaie et al. (2023)** titled "Effect of Jigsaw Learning Strategy on Maternity Nursing Students' Practical Achievements", which found no significant difference in the academic achievement mean scores of male and female maternity nursing students in study group who taught three procedures, including "perineal care, breast care, and uterine massage" by jigsaw teaching strategy.

The researcher believes that the use of the jigsaw teaching approach may have helped address the disengagement often associated with male students when studying maternity nursing. Overall, the researcher sees these findings as valuable insights into the potential benefits of the jigsaw teaching approach, particularly in addressing gender-based differences in engagement and achievement in the field of maternity nursing. The findings suggest that the jigsaw strategy may be an effective teaching method for supporting the academic success of both male and female students in this subject area, where gender-based disparities in engagement and performance have been observed previously.

### 5. CONCLUSION

In the light of the findings of the current study, the current study concluded that Jigsaw learning strategy improves the maternity nursing students' achievement, as students' achievements scores of labor clinical area were higher among study group (jigsaw strategy) than the control group (traditional) with a statistical significant differences. This means that the hypothesis of the current study was achieved.

### 6. RECOMMENDATIONS

**Based on the findings of this study the following recommendations are derived and suggested:**

1. Applying jigsaw learning strategy as a teaching method in all nursing academic courses both theory and practice to achieve learning outcomes that focus on cultivating students' practical capabilities and to make learning more students centered.
2. Training workshops should also be conducted for course planners and educators (faculty staff members) to adapt the jigsaw technique as an innovative teaching and learning strategy.
3. Engaging students in the manipulation of up to-date teaching strategies to improve their cooperation skills and enhance their problem-solving skills and creativity in theory and practice courses

#### **Further research:**

1. Further research should be carried out to assess the utility and feasibility of using various models of teaching that meet the learning needs of students and enable achieving nursing learning outcomes

### International Journal of Novel Research in Healthcare and Nursing

Vol. 11, Issue 2, pp: (285-297), Month: May - August 2024, Available at: [www.noveltyjournals.com](http://www.noveltyjournals.com)

2. The researcher also highlights the need for further research to assess the factors that may influence the success of the Jigsaw approach in diverse educational settings, particularly in nursing education
3. This study should be replicated using larger sample sizes and in different nursing specialties to help generalize the findings.

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