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Effect of Jigsaw learning Method on Theoretical Achievement of Technical Nursing Institute Students regarding the Second Stage of Labour

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Abstract

Background: Jigsaw learning Method affects theoretical achievement. **Aim of the study:** was to evaluate the effect of Jigsaw learning method on theoretical achievement of technical nursing institute students regarding the second stage of labour. **Setting:** The study was conducted at Technical Nursing Institute in Benha University. **Research design:** A quasi-experimental study was utilized to conduct the study. **Sample:** A systematic random sample included 60 nursing students was selected and divided equally into two groups control and study groups. **Tools of data collection:** Two tools were used: **Tool (I)** A structured self- administrated questionnaire**: part (1)** General characteristics of the nursing students. **Part (2)**: student's knowledge assessment questionnaire. **Tool (II):** Cooperative Jigsaw Opinion Sheet. **Results:** The present study revealed that, after implementation of the Jigsaw learning method the mean scores of theoretical achievements were finally higher in the study group compared to control group ($P \leq 0.05$). Also, the majority of the stud group were satisfied toward Jigsaw learning method. **Conclusion**: The Jigsaw learning method was greatly more effective in improving theoretical achievement of students toward the second stage of labor. **Recommendations:** Integration of Jigsaw learning method in curriculum development at obstetrics and gynecology field.

Key words: *Jigsaw learning Method, Theoretical Achievement, Second Stage of Labor.*

Introduction

Normal labor is the process by which a single mature viable fetus presenting by vertex is expelled from the uterus. The process of labor terminates spontaneously through birth canal and without any interference and without any complications for woman or fetus within 24 hours. The students should be well-informed about managing the labor as a critical part in maternity health nursing [1].

Labor is broken down into four stages. The first stage begins when actual labor pains appear and ends when the cervix fully dilates. In the second stage, the fetus is expelled from the delivery canal when the cervix has fully dilated. The placenta and membranes are expelled at the end of the third stage, which starts after the fetus is expelled. After the placenta and membranes are expelled, the fourth stage, known as the "early recovery stage," starts and lasts for one to four hours following delivery [2].

The fetus is expelled during the second stage of labor, which lasts from full cervical dilatation until fetus delivery. It lasts between one and two hours for primigravida and between half an hour and an hour for multigravida, and it includes the delivery of the head, shoulder, and body [3]. Mechanism of delivery of head through cardinal movement refer to the changes in position of fetal head during passage through the birth canal which include; descent, engagement, increased flexion, internal rotation, extension to comes out of head, restitution and external rotation of head then delivery of posterior shoulder and anterior shoulder then the body [4].

Nursing students learn a certain amount of information related to many specialties through traditional educational methods, but they lack the tools necessary to develop analytical thinking skills or to successfully interpret, assess and organize new information. It is crucial that universities shift their duties, especially for the medical and nursing faculties, and foster critical thinking and reasoning abilities rather than only memorization [5].

The Jigsaw strategy is one of the latest cooperative learning-based teaching techniques. One collaborative and cooperative learning technique is the jigsaw approach [6]. Students can engage with one another, prepare for themselves, participate in course materials, lead and present in peer groups and support one another's learning through this integrated learning strategy. The approach, which involves students directly and is carried out under supervision, helps to activate learning qualities [7].

The jigsaw approach offers equal chances for problem-solving and thought processes. The jigsaw cooperative learning model also offers the benefit of teaching contentious clinical topics during internships, learning new tactics from peers, developing students' critical thinking skills, boosting self-esteem and sense of self-efficacy, improving leadership abilities, improving social communication skills and encouraging more creative behaviors [8].

Five key components make up the jigsaw learning methods: positive autonomy, interaction promotion, individual accountability, teaching social and interpersonal skills and group processing quality. Collaborating in groups has been shown to enhance the academic, social, affective and psychological growth of nursing students. The advantages of cooperative learning include enhanced critical thinking abilities, problem-solving abilities, higher-level reasoning, less stress and anxiety, enhanced

drive to learn and more favorable views toward the subject, and increased self-esteem [9].

The transfer of knowledge gained in educational settings to clinical settings and society in order to achieve desired health outcomes is one of the main functions of nursing education. The goal of nursing education is to improve students' academic performance by teaching them how to solve problems and think critically [10].

Additionally, preparing students for clinical practice is the responsibility of nurse educators. Three key factors; knowledge, clinical practice and confidence have been chosen to be the main focus. Undergraduate education is based on nursing knowledge and clinical practice, which also effectively foster students' contentment, self-confidence, and clinical practice, nurse educators must thus continuously discover, apply, and evaluate teaching-learning methodologies [11].

Significance of the study

In 2017, about 295 000 women lost their lives during and after pregnancy and childbirth, a rate of maternal mortality that is unacceptable. Most of these deaths might have been avoided, and the great majority (94%) happened in environments with little resources [12].

Additionally, a significant contributing factor to the incidence of problems for pregnant women and consequently, an increase in maternal death rates is nurses' lack of knowledge and expertise about the second stage of labor [7]. 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 [13]. Hence, the presence of qualified, competent and cooperative learning methods for maternity nursing students will deliver high quality maternity care where students can be invaluable in preventing harm to mothers and improving labor 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 mothers' care situations [14].

In faculty of nursing, Benha University there is insufficient 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 and decision-making skills. In addition to the lack of Egyptian studies that addressed Jigsaw Technique subject in maternity specialty. Since there are no studies on the Jigsaw learning method among Benha University's nursing faculty, this study will be carried out to assess its impact on the theoretical achievement of students at technical nursing institutes with regard to the second stage of labor. Jigsaw is thought to be a more advanced learning method than traditional methods.

Aim of the study

evaluate effect of Jigsaw learning method on theoretical achievement of technical nursing institute students regarding the second stage of labor

Research Hypotheses

- The Technical Nursing Institute students who will receive Jigsaw learning method would have higher theoretical achievement compared to students in the lecture group regarding the second stage of labor.

Operational definitions: Jigsaw learning Method is a research- based cooperative learning technique invented and developed in the early 1970s by Elliot Aronson, in which students are actively involved in the teaching- learning process.

Subject and methods

Research design:

To achieve the study's goal, a quasi-experimental (pre and posttest) study design was used

Study setting: Technical Nursing Institute, Benha University.

Sampling:

Sample type: A systematic random sample was used from the above-mentioned study setting.

Sample size: The current study involved 60 nursing students.

Sample technique :

Using a systematic random selection, every tenth of the 600 second-year nursing students who attended the first semester of the academic year (2023–2024) were selected. The names of the students are used to separate nursing students into two groups.

Tools of data collection

Two tools were utilized for collecting data .

Tool I- A structured self-administered questionnaire:-

The researcher created it with the help of supervisors and after studying the most recent research in the field. It contained the two sections listed below:

Part (1): General characteristics of the nursing students. Age, gender, marital status and place of residence were its four components.

Part (2): Student's knowledge assessment questionnaire (pre-post-test):

It was designed by the researchers after reviewing related literature [15,16,17]. It was composed of closed-ended questions in English and was intended to evaluate the theoretical knowledge of Technical Nursing Institute students about the second stage of labor. It has two sections with seventeen multiple-choice questions:

Section (1): - knowledge regarding the second stage of labor which included 9 multiple choice questions such as (definition of labor, definition of the second stage of labor, duration of the second stage of labor in primipara, duration of the second stage of labor in multipara, signs of the second stage

of labor, mechanism of normal labor, proper position during labor, definition of crowning, outcome of the second stage of labor).

Section (2): - knowledge regarding episiotomy which included 8 multiple choice questions such as (definition of episiotomy, maternal indications of episiotomy, fetal indications of episiotomy, contraindication of episiotomy, the best time for anesthesia, the best time for episiotomy, type of surgical suture for perineal muscle repair after episiotomy and type of surgical suture for perineal skin repair after episiotomy).

Scoring system:

Each question was assigned a score (2) give when the answer was correct and a score (1) when the answer was incorrect. The total score for the student's knowledge assessment was calculated by the addition of the total score of all questions and ranged from (1-٣٤). The total score for the student's knowledge assessment was classified as the following:

- Adequate knowledge: ≥ 75 % of total score.
- In adequate knowledge: < 75 % of total score.

Tool II: Cooperative Jigsaw Opinion sheet: (Appendix III) :

It was adopted from [18] to assess the students' opinions related to jigsaw strategy as a learning method among study group. There were fourteen statements in all.

Scoring system: A three-point Likert scale was used to rate each item: a score of three (3) indicated agreement, a score of two (2) indicated neutrality, and a score of one (1) indicated disagreement. The sum of all item scores was used to get the final scores, which varied from 1 to 42. A higher number denoted agreement. The overall score was categorized as follows:

- Satisfactory opinion: ≥ 75% of total score .
- Unsatisfactory opinion: < 75 % of total score.

Validity of the tools: Three panels of experts in the fields of obstetrics and gynecological nursing at Benha University's Faculty of Nursing evaluated the data collection tools to assess content validity. Based on evaluations, the questionnaire was adjusted to improve sentence structure and content appropriateness.

Reliability of the tools: The Cronbach's Alpha coefficient test was used to assess reliability, and the results showed that the internal consistency of the student knowledge assessment questionnaire was 0.81, and the internal consistency of the Cooperative Jigsaw Opinion sheet was 0.80.

Ethical considerations: Before beginning the study, the Benha University Faculty of Nursing's Scientific Research Ethical Committee granted its approval (the ethical code was 76). Before using the Jigsaw learning approach and beginning data collecting, the researcher gained the confidence and trust of each student nurse who took part in the study by explaining its purpose to them. Prior to their participation in the trial, all student nurses. The purpose and context of the study were mentioned in a letter of approval that was delivered to the director of Benha University's Technical Nursing Institute. The study's instruments made sure that no participant's dignity, culture, customs, or religion was violated, and that no one was harmed while data was being collected. also respected human rights and omitted any unethical

Pilot Study:

A pilot study was carried out on 10 % of the total sample size (6 students) to test the clarity, feasibility and applicability of tools. Also, assess study setting, availability of essential equipment and tools content validity according to statistically analysis of a pilot study and to estimate the time needed for data collection. According to results of the pilot study no modifications were carried out. The students involved in the pilot study were excluded from study sample.

Field work:

The researcher first explained the aim of the study to the participants and reassure the students that information collected would be treated confidentiality. The study was carried out through the following phases; preparatory phase, interviewing and assessment phase, planning phase, implementation phase and evaluation phase.

Preparatory phase

It was the first phase of the study and included reviewing current, past, local national and international advanced related literatures. Finally, the researcher conducted the pilot study to ascertain content validity of the tools.

Interviewing and Assessment phase:

- The study was conducted from the beginning of October 2023 to the beginning of January 2024 (three months) for implementing a Jigsaw learning method.
- The researcher visited the previously mentioned setting two days / week (Saturday and Sunday) according to academic schedule table of second year students from 9 Am to 2 Pm then the researcher introduced herself, greet students and all students was interviewed to collect the basic data, the purpose of the study was explained by the researcher and an oral consent was taken to participate in the study.
- The researcher distributed a structured self-administered questionnaire (tool I-part I) to assess the students' general characteristics. Finally, the researcher distributed student's knowledge assessment questionnaire (tool I- part II pre posttest) to assess the theoretical achievement of the technical nursing institute students regarding second stage of labor and the tools was collected at the end of the day.

Planning phase:

- The traditional strategy of learning "Lectures" was developed for the control group. Researcher prepared theoretical content "handout" to be given to the students.

- It started by preparing all information regarding the concept of jigsaw strategy, the main purpose and technique. The researcher determined the objectives of study subjects related to the second stage of labor.
- Researcher prepared theoretical content "handout" to be given to the students. Lectures designed for both groups were delivered.
- According to the results of pretest assessment of students' knowledge related to second stage of labor, the sessions number and content were determined.

Implementation phase:

- Students in both study and control groups underwent a number of theoretical sessions, with each session lasting from 60- 90 minutes.

A- For the control group (lecture group):

- The Researcher presented scientific content in the form of lecture for the control group in 2 learning sessions for 2 days over a period of one week according to a predesigned schedule of the Obstetrics and Gynecology nursing course time table.
- The lecture was presented for students as power point presentations.
- The researcher conducted a classroom group discussion for all students to clarify any missing point of contents.
- And at the end of the lecture, the main points of content were summarized.

B. For study group (Jigsaw group):

- Implementation phase included four learning sessions through 2 weeks (2 sessions / week) as the following consequence:

Session 1: (orientation Session):

- 1. Before starting the second stage of labor; the study group attended an orientation session for two hours, to be trained on the process of jigsaw strategy as a learning method.
- 2. First, the researcher explained in detail the jigsaw as a learning strategy including its concept, objectives, steps and benefits to the students through a lecture by using power point presentations.
- Further, the researcher distributed an illustrated handout describing jigsaw strategy to students. Then the researcher divided students into 5 groups, each group consisted of 6 students. These were the "jigsaw groups".
- 3. A team leader from students was assigned to each group. A team leader function was to facilitate group discussions and sharing.
- 4. The second stage of labor lectures were divided into 6 different subtopics including (definition of labor and normal labor, stages of labor, dignosis of the second stage of labor, assessing of uterine contraction, mechanism of labor and episiotomy).
- 5. Each student of the jigsaw group was assigned for one sub-topic and received a card with student subtopic, as well as a few leading questions to help students learn about topic.
- 6. Next, the students who were assigned for the same sub-topics in all the 6 jigsaw groups collected to form "expert groups".
- The students were asked to prepare the subtopics for discussion in expert group in the next session. Researcher provided the same handout given for the control group regarding the second stage of labor to the study group.
- Also, the researchers suggested resources (textbooks, research articles and websites) to direct the students and help students in preparing topics.
- The groups were instructed to prepare the topic well, read well and do extra reading than the hand out.
- The researcher ensured that all information about the prepared subtopics by students was accurate and could be corrected before the student's started discussion in front of groups and clearing doubts.

Session 2: (Expert groups discussion):

- The expert group worked together discussing topics.
- Each student shared acquired knowledge regarding the topics. The others noted down additional points and clearing doubts, if any, to the researcher.

Session 3: (jigsaw groups discussion):

- The students returned to jigsaw group again to present subtopic to students.
- Finally, students discussed topics together to improve thinking ability, cooperation, interactions and active learning.
- The researchers floated between groups and facilitated the whole process.

Session4: (cooperative learning):

- In the last session one student from each "jigsaw group" was randomly selected and asked to teach a particular topic to the whole class.
- The student was permitted to use the board. Since all topics could be discussed.
- The students were also encouraged to ask questions if students had any to the presenter and the researchers' clarified inquiries.

Evaluation phase:

-All the students for both groups were assessed immediately after the study for theoretical achievements regarding the second stage of labor using the tool (I) part two (students' knowledge assessment

questionnaire).

-Finally, cooperative jigsaw opinion sheet (tool II) was distributed to assess the study group's opinions related to the jigsaw strategy as learning strategies.

Statistical design:

statistics have been confirmed prior for automatic access. The Final package deal for Social Sciences (SPSS version 20. zero) turned into used. Descriptive facts have been carried out (e.g., imply, popular deviation, frequency and probabilities). assessments on significance (chi square, fisher genuine check, unbiased t check, Pearson correlation and coefficient test) changed into carried out for check the take a look at hypothesis .

- No finally great difference was considered as p-value > 0.05
- A finally great difference was considered at p-value p ≤ 0.05

Limitation of the study:

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

Results:

Table (1) clarifies that 63.3% of the control group were in the age group of 19 years with a mean age of 19.36 ± 0.49 years and 80.0% of the study group were in the age group of 19 years with a mean age of 19.30 ± 0.70 years. Regarding gender, less than two thirds 60.0% of the study group and less than three quarters 63.3% of the control group were female. Moreover, 73.3% and 60.0% of the study and control groups respectively were from urban areas.

Table (2): shows that there was no statistical significance difference between study and control groups according to knowledge related to the second stage of labor before implementation of the Jigsaw learning method (p > 0.05). Meanwhile, there was a statistical significance difference between study and control groups according to knowledge related to the second stage of labor after implementation of the Jigsaw learning method (P ≤ 0.05).

Table (3) shows that there was no statistical significance difference between study and control groups according to knowledge related to the episiotomy before implementation of the Jigsaw learning method (p > 0.05). Meanwhile, there was a statistical significance difference between study and control groups according to knowledge related to episiotomy after implementation of the Jigsaw learning method (P ≤ 0.05).

Table (4): reveals that (100%) of the Jigsaw group stated that Jigsaw method made course content easy to understand, (96.7%) of the Jigsaw group stated that Jigsaw method made learn better. (93.4%) of the Jigsaw group reported that Jigsaw learning strategy enhanced the possibility of the learner's interested in each student, (93.4%) of the Jigsaw group stated that Jigsaw learning strategy improved critical thinking and decision-making skills. (93.4%) of the Jigsaw group stated that everyone in the group shared responsibility, (93.3%) of the Jigsaw group stated that Jigsaw method enhanced communication skills and self-confidence. (90.0 %) of the Jigsaw group stated that Jigsaw method enhanced teamwork cooperation.

Figure (1): Illustrates that more than three quarters (90 %) of the study group had higher scores of total knowledges regarding the second stage of labor and episiotomy compared with (70 %) of the control group after implementation of Jigsaw learning method.

Figure (٢): Shows that more than three quarters (86.7%) had satisfactory opinion regarding Jigsaw learning strategy compared with (13.3%) had un satisfactory opinion of the study group.

Table (1): Distribution of the studied sample in both groups according to general characteristics (n= 60).

General characteristics	Study group n=30		Control group n= 30		X2/FET	p-value
	No	%	No	%		
Age in (years)						
19-	24	80.0	19	63.3		
20-	4	13.4	11	36.7	5.63 €	0.072
21-	1	3.3	0	0.0		
22	1	3.3	0	0.0		
Mean ± SD	19.30 ± 0.70		19.36 ± 0.49		t= 0.426	0.671
Gender						
Male	١٢	٤٠.٠	١١	٣٦.٧	0.٠٧١	0.٧٩١
Female	١٨	٦٠.٠	١٩	٦٣.٣		
Marital status						
Un married	30	100.0	28	93.3	2.06	0.150
Married	0	0.0	2	6.7		
Residence						
Rural	8	26.7	12	40.0	1.20	0.273
Urban	22	73.3	18	60.0		

No Statistically significant (P>0.05) *Statistically significant (P≤0.05)

Table (2): Distribution of the studied sample in both groups according to knowledge regarding the second stage of labor at pre and post implementation (n=60).

Knowledge items	Pre-implementation					Post-implementation				
	Study group n=30		Control group n=30		X2 p-value	Study group n=30		Control group n=30		X2 p-value
	No	%	No	%		No	%	No	%	
Definition of labor										
Correct answer	1	3.3	2	6.7	0.351	30	100.0	25	83.3	5.45
Incorrect answer	29	96.7	28	93.3	0.554	0	0.0	5	16.7	0.02*
Definition of the second stage of labor										
Correct answer	1	3.3	4	13.3	1.96	27	90.0	21	70.0	3.75
Incorrect answer	29	96.7	26	86.7	0.161	3	10.0	9	30.0	0.05*
Duration of the second stage of labor in primipara										
Correct answer	2	6.7	3	10.0	0.218	29	96.7	24	80.0	4.04
Incorrect answer	28	93.3	27	90.0	0.640	1	3.3	6	20.0	0.04*
Duration of the second stage of labor in multipara										
Correct answer	2	6.7	6	20.0	2.30	30	100.0	24	80.0	3.66
Incorrect answer	28	93.3	24	80.0	0.129	0	0.0	6	20.0	0.01*
the sign of the second stage of labor										
Correct answer	3	10.0	2	6.7	0.218	24	80.0	22	73.3	1.66
Incorrect answer	27	90.0	28	93.3	0.640	6	20.0	8	26.7	0.197
Mechanism of normal labor										
Correct answer	3	10.0	1	3.3	1.07	26	86.7	19	63.3	4.35
Incorrect answer	27	90.0	29	96.7	0.301	4	13.3	11	36.7	0.03*
Proper position during labor										
Correct answer	1	3.3	3	10.0	1.07	29	96.7	25	83.3	2.96
Incorrect answer	29	96.7	27	90.0	0.301	1	3.3	5	16.7	0.08
Definition of crowning										
Correct answer	1	3.3	2	6.7	0.351	25	83.3	18	60.0	4.02
Incorrect answer	29	96.7	28	93.3	0.554	5	16.7	12	40.0	0.04*
Outcome of the second stage of labor										
Correct answer	4	13.3	1	3.3	1.96	26	86.7	18	60.0	5.45
Incorrect answer	26	86.7	29	96.7	0.161	4	13.3	12	40.0	0.02*

No Statistically significant (P>0.05) *Statistically significant (P≤0.05)

Table (3): Distribution of the studied sample in both groups according to knowledge regarding episiotomy at pre and post implementation (n=60).

Knowledge items	Pre-implementation					Post-implementation				
	Study group n=30		Control group n=30		X2 p-value	Study group n=30		Control group n=30		X2 p-value
	No	%	No	%		No	%	No	%	
Definition of episiotomy										
Correct answer	2	6.7	5	16.7	1.45	30	100.0	26	86.7	4.28
Incorrect answer	28	93.3	25	83.3	0.228	0	0.0	4	13.3	0.03*
Maternal indication of episiotomy										
Correct answer	3	10.0	2	6.7	0.218	28	93.3	22	73.3	4.32
Incorrect answer	27	90.0	28	93.3	0.640	2	6.7	8	26.7	0.03*
Fetal indication of episiotomy										
Correct answer	4	13.3	1	3.3	1.96	30	100.0	25	83.3	5.45
Incorrect answer	26	86.7	29	96.7	0.161	0	0.0	5	16.7	0.02*
Contraindication of episiotomy										
Correct answer	3	10.0	2	6.7	0.218	28	93.3	21	70.0	5.45
Incorrect answer	27	90.0	28	93.3	0.640	2	6.7	9	30.0	0.02*
Best time for anesthesia										
Correct answer	4	13.3	3	10.0	0.162	26	86.7	19	63.3	4.35
Incorrect answer	26	86.7	27	90.0	0.688	4	13.3	11	36.7	0.03*
Best time for episiotomy										

Correct answer	1	3.3	3	10.0	1.07	27	90.0	20	66.7	4.81
Incorrect answer	29	96.7	27	90.0	0.301	3	10.0	10	33.3	0.02*
Type of perineal muscle suture after episiotomy										
Correct answer	1	3.3	4	13.3	1.96	24	80.0	17	56.7	3.77
Incorrect answer	29	96.7	26	86.7	0.161	6	20.0	13	43.3	0.05*
Type of perineal skin suture after episiotomy										
Correct answer	1	3.3	0	0.0	1.01	26	86.7	19	63.3	4.35
Incorrect answer	29	96.7	30	100.0	0.313	4	13.3	11	36.7	0.03*

No Statistically significant (P>0.05) ***Statistically significant (P≤0.05)**

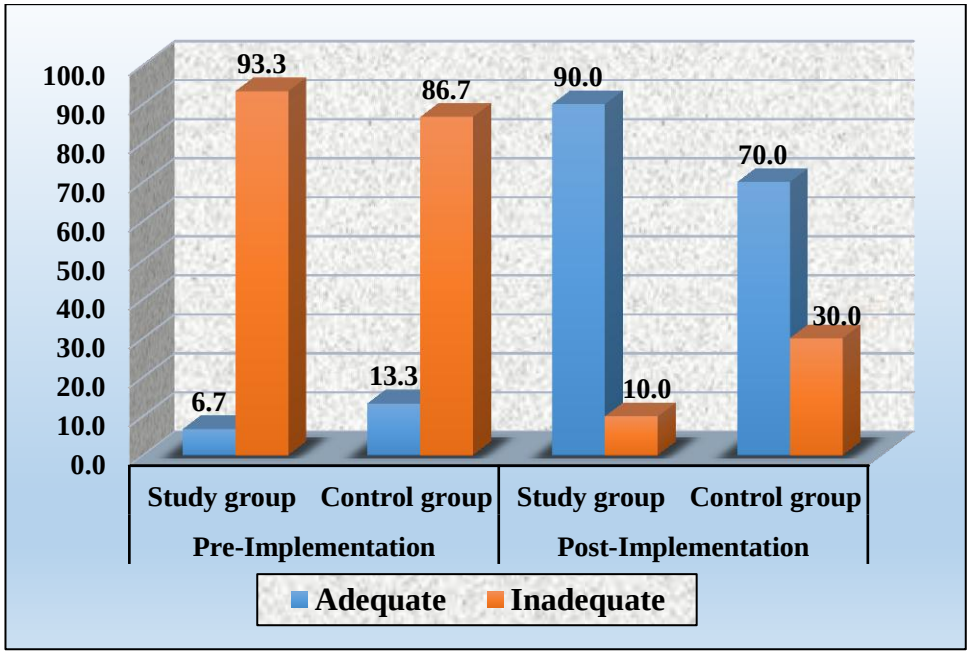

Fig. (1) Distribution of the studied sample in both groups according to total knowledge regarding the second stage of labor and episiotomy at pre and post implementation (n=60).

Table (4): Distribution of the students in study group according to opinions regarding Jigsaw learning strategy (n=30).

Students' opinions	Agree		Neutral		Disagree	
	No	%	No	%	No	%
It made the course content easy to understand.	٣٠	١٠٠.٠	٠	٠.٠	0	٠.٠
It made learn better	29	96.7	1	3.3	0	0.0
It ensured the correction of misinformation.	٢٧	٩٠.٠	٣	١٠.٠	٠	٠.٠
It increased the possibility of the teacher's interested in each student.	٢٨	٩٣.٤	١	٣.٣	١	٣.٣
The dependence of the students upon the teacher was lessened.	١٩	٦٣.٣	١	٣.٣	١٠	٣٣.٤
It enhanced communication skills and self-confidence.	٢٨	٩٣.٣	٢	٦.٧	٠	٠.٠
It enhanced teamwork cooperation.	٢٧	٩٠.٠	٢	٦.٧	١	٣.٣
Everyone in the group shared responsibility.	٢٨	٩٣.٤	١	٣.٣	١	٣.٣
It made the ideas within the group to be discussed more positively.	٢٦	٨٦.٧	٤	١٣.٣	٠	٠.٠
It improved critical thinking and decision-making skills.	٢٨	٩٣.٤	٢	٦.٦	٠	٠.٠
It facilitated applying knowledge into clinical practice.	٢٦	٨٦.٧	٣	١٠.٠	١	٣.٣
It was the innovative teaching-learning method.	٢٥	٨٣.٤	٤	١٣.٣	١	٣.٣
Overall satisfied with this teaching method.	٢١	٧٠.٠	٨	٢٦.٧	١	٣.٣
Applying jigsaw strategy as a teaching method in other nursing courses "(theory and practice).	٢٢	٧٣.٣	٥	١٦.٧	٣	١٠.٠

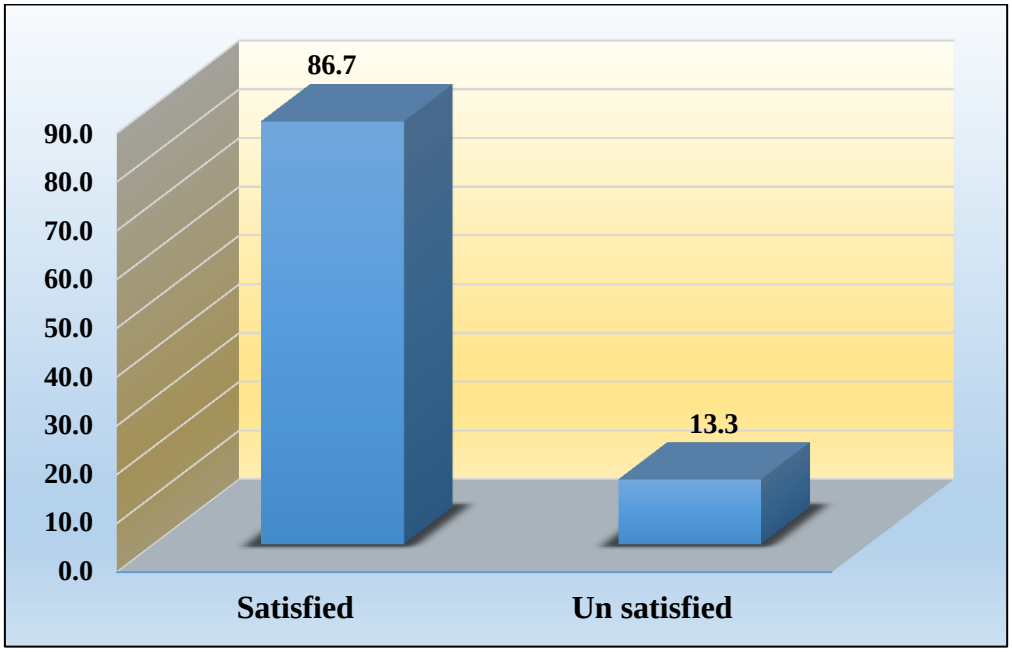

Fig. (2): Distribution of the students in study group according to total opinions regarding Jigsaw learning strategy (n=30).

Discussion

Today, jigsaw learning method has an increasing number of implementations in an academic level as it encourages students to listen, cooperate and exchange ideas [19]. Therefore, the present study aimed to evaluate the effect of jigsaw learning method on theoretical achievement of technical nursing institute students' regarding the second stage of labor. Overall, the findings of this study supported the above-mentioned hypothesis.

The findings of the current study were presented under three main sections, general characteristics of the studied sample, knowledge of the studied sample regarding the second stage of labor, and students' opinion regarding Jigsaw learning method in study group.

As regards general characteristics of the studied sample, the results of the present study showed that more than two thirds of the control group and more than three quarters of the study group were in the age group of 19 years with a mean age of 19.36 ± 0.49 years and 19.30 ± 0.70 years respectively, nearly three quarter of the studied sample were from urban area and more than half of the studied sample were female. Also, there was no significant difference found between the study and control groups regarding general characteristics. This result is similar to a study performed by [18] who studied *"Utilization of Jigsaw Cooperative Learning Strategy on Maternity Nursing Students' Attitude and Achievement"* and showed that there were no Statistically significant differences regarding socio-demographic characteristics for the studied groups (P > 0.05). This is due to the fact that the students of the study sample were subjected to the same teaching environment and the same educational opportunities, the curriculum for both male and female students had the same activities.

Concerning knowledge, the current study revealed that there was no statistical significance difference between study and control groups regarding all knowledge's items related to the second stage of labor 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 labor after implementation of the Jigsaw learning method (P ≤ 0.05). Also, more than three quarters of the study group had higher scores of total knowledges regarding the second stage of labor and episiotomy compared with more than two thirds of the control group after implementation of Jigsaw learning method. This result may be due to the positive effect of the Jigsaw learning method, the learning sessions and simple explanations that was given to students. So, nursing students were very interested and satisfied during the learning sessions. The current finding was supported by the findings of [20] who studied *"Effect of Jigsaw Learning Strategy on Nursing Students' Understanding of Normal Labor Concept"* on 100 nursing students and showed that there was a significant difference in the knowledge score between pre and post-test results at (p value=<0.001).

From the researcher point of view, these similarities between results may be as a result of students were concerned in preparing lecture's material which helped students to think deeply, let students feel more

inspired and encourage students to reflect this knowledge on care in maternity field easily. On the other hand, this result is contradicted with [21] studied *"using the Jigsaw cooperative learning technique for nursing students"* and revealed that using cooperative learning Jigsaw does not just advance academic achievement. 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).

In relation to students` opinions regarding jigsaw learning method, results of this study illustrated that this method enhanced team work cooperation, communication skills, critical thinking skills and self-confidence. Also, more than three quarter of study group had satisfactory opinion regarding Jigsaw learning method compared with less than one quarter of students had unsatisfactory opinion regarding Jigsaw learning method. From the researcher point of view, students working in cooperative learning groups enjoyed cooperative activities because cooperative learning improved relationships with peers, decreased conflict in the group and enhanced self-esteem. Also, students in the cooperative learning groups felt more interested in learning and less anxious.

This result agrees with [22] who studied "*Effect of Jigsaw Learning Strategy on Maternity Nursing Students' Theoretical Achievements*" and showed that most of the study group reported that, this method enhanced team work, communication skills, critical thinking skills and self-confidence.

Conclusion:

Based on the finding of the current study, it was concluded that the implementation of the Jigsaw learning method was effective than lecture in the improvement of theoretical achievement of nursing students regarding the second stage of labor. Additionally, students in the study group had satisfactory opinion regarding the use of jigsaw strategy. Therefore, the aim was achieved and the study hypothesis was supported.

Recommendations

- Integration of Jigsaw learning method in curriculum development at obstetrics and gynecology field.
- Further studies should be implemented to assess the effect of jigsaw learning strategy on students' clinical achievement.

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