

EFFECT OF JIGSAW LEARNING STRATEGY ON MATERNITY NURSING STUDENTS' PRACTICAL ACHIEVEMENTS

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ABSTRACT

Cooperative learning is a form of learning, in which nursing students are actively involved in the teaching-learning process **Aim**; this study aimed to evaluate the effect of jigsaw learning strategy on maternity nursing students' practical achievements. **Study design**; a quasi-experimental design was used in this study. **Setting**; this study was conducted at the Faculty of nursing in Kafr-elsheikh University. **Subject**; simple random sample of (150) students. Those students were divided into two groups, control group (75) and study group (75). Data **collection tools**: 1) self-administered questionnaire,2) Checklist, 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' practical achievements (post & follow up) as; students' practical achievement scores were higher among study group compared to control group at post and follow up checklist. **Conclusion**; Jigsaw learning strategy is effective in enhancing maternity nursing students' practical achievements. **Recommendation**; apply jigsaw learning strategy as a teaching method in theory and practice of all nursing academic courses.

INDEXTERMS: Jigsaw learning strategy – students' achievement.

INTRODUCTION

Cooperative teaching methods is one of the most comprehensive approaches that are implemented in a variety of ways. Regardless of the type of cooperative learning approach, generally learners in small groups work together to achieve a common goal, which is beneficial for each [1]. Cooperative learning approach provides the potential for the active participation of learners in cognitive, metacognitive and motivational learning areas and help them set learning goals. Thus, they achieve self-efficacy and a higher level of success [2]. One of the new methods of teaching based on cooperative learning approach is the Jigsaw strategy. Jigsaw learning strategy is one of the integrated learning techniques that instigate students to get involved with their course materials, prepare for themselves, lead and present among their peer group and encourage each other to learn. The technique is done with the aid of the teachers and performed under their supervision thus helping to activate students learning instincts by involving directly. It also helps the students to create peer support, expand deep thinking and perception with their group

members. It provides equal opportunities to engage in thinking and problem solving [3]. Another advantage of the jigsaw cooperative learning model is the ability to learn more than multiple educational contents, teaching controversial clinical topics during internships, learning new strategies from peers, enhancing the critical thinking in students, enhancing the self-esteem and gaining a sense of self efficacy, enhancing leadership skills, enhancing social communication skills, and enhancing creative behaviors [4]. A primary role of nursing education is application of acquired knowledge from educational environments to clinical environments and society towards desired health outcomes. The nursing education needs to accomplish problem solving, critical thinking skills thereby improving the student's academic achievement [5].

SIGNIFICANCE 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 [6]. In faculty of nursing, Kafr-el-Sheikh 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, 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' 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' practical achievements.

SUBJECT AND METHODS:

A- Research design:

A quasi-experimental design was used..

B- Setting:

This study was conducted at the Faculty of nursing in Kafr-sheikh University.

C- Subject:

The sample type was Simple random sample. The students were numbered and then the researcher chose the odd numbers to form both control and study group.

*Inclusion 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.

D- Tools of data collection

Tool (1): self-administered questionnaire:

The researcher constructed a questionnaire sheet after reviewing the related literature. It was used to assess personal characteristics of students as: (age, gender, marital status, residence, and previous level of education. It took 5 minutes to be filled by students.

Tool (2) Checklist:

The researcher used the formal checklist of her department to assess the practical part of postpartum minor discomforts for students (checklist for perineal care, breast care, and uterine massage).

Scoring system:

Students' practice was calculated for each step as follows: done was scored (2 points), partially done was scored (1 point), while not done was scored (zero point). Student's practical achievement in the checklist was scored according to the following:

- complete level: >75%
- accepted level: 50%- 75%
- unaccepted level: <50%

Tool (3) Students' Opinion Sheet:

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

Tools 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.

Administrative design:

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

Ethical consideration:

1. The approval was obtained from Scientific Research Ethical committee in Faculty of Nursing at Ain Shams University before starting the study.
2. The aim of the study was explained to each student and an oral consent to participate was obtained.
3. The students were given an opportunity to refuse to participate and to withdraw at any stage of the research.

4. Additionally, the students were assured that the information will be confidential and used for the research purpose only without any effect on their current at future academic course assessment.

Operational design

The operational design includes preparatory phase, pilot study, and field work.

Preparatory phase:

It 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, 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.

Field work:

- The researcher explained the purpose of the study to the participants of both groups
- The researcher distributed the self-administered questionnaire to assess the students' personal characteristics (tool I).

For control group:

The researcher presented the scientific content of the three procedures (perineal care, breast care, and uterine massage) in the lab of the faculty using the required equipment. The researcher conducted group discussion for all students to clarify any point of contents.

For study group:

Implementation Phase for 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.

- The clinical contents were divided into three procedures including "perineal care, breast care, and uterine massage".
- Each two members of the jigsaw group were assigned for one procedure.
- Next, the students who were assigned for the same procedure in all the 12 jigsaw groups collected to form "expert groups" (table 1).

Session 2: (Expert groups discussion)

- The students were asked to prepare the procedures and performed them to their expert group.
- The researcher ensured that all steps of the prepared procedures by students were accurate and they could be corrected before the students started their performance.

Table 1: Formation of jigsaw groups and expert groups

jigsaw groups													Procedure performed by jigsaw	
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)		
Expert groups	G1	A1	B1	C1	D1	E1	F1	G1	H1	I1	J1	K1	L1	Perineal care
	G2	A2	B2	C2	D2	E2	F 2	G2	H2	I2	J2	K2	L2	Perineal care
	G3	A3	B3	C3	D3	E3	F3	G3	H3	I3	J3	K3	L3	Breast care
	G4	A4	B4	C4	D4	E4	F4	G4	H4	I4	J4	K4	L4	Breast care
	G5	A5	B5	C5	D5	E5	F5	G5	H5	I5	J5	K5	L5	Uterine massage
	G6	A6	B6	C6	D6	E6	F6	G6	H6	I6	J6	K6	L6	Uterine massage

Session 3: (jigsaw group discussion)

The students returned to their jigsaw groups again to perform their procedure to others. The researcher floated between groups and facilitated the whole process.

Session 4:

The last step was of 2 hours duration, in which one member from each "jigsaw group" was randomly selected and asked to perform a particular procedure to the whole students, and the researcher clarified their doubts regarding some steps in the procedures.

Finally, students' Opinion sheet was distributed to assess students' opinions related to jigsaw strategy as a teaching method.

Evaluation:

- Assessment of the students' practical achievements was done using checklist immediately after performance and follow up after 2 weeks.
- 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.

LIMITATION OF THE STUDY:

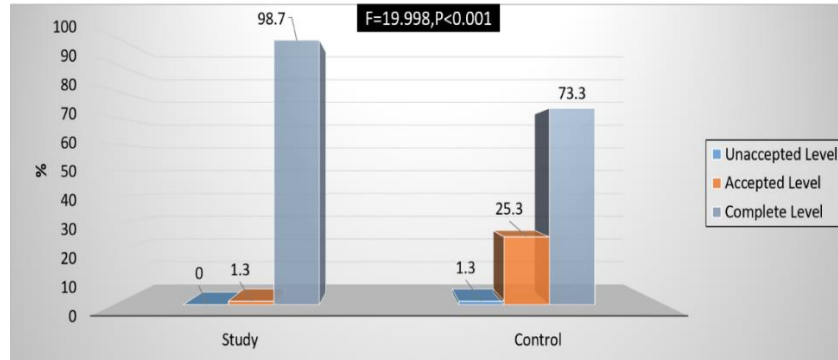
- Insufficient Egyptian nursing studies and inadequate references were found regarding applying jigsaw strategy in clinical practice.

RESULT

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 ²	P
Age (Years)						
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
Sex						
Male	25	33.3	29	38.7		
Female	50	66.7	46	61.3	0.463	0.496
Marital Status						
Unmarried	67	89.3	67	89.3		
Married	8	10.7	8	10.7	0.000	1.000
Residence						
Urban	27	36.0	24	32.0		
Rural	48	64.0	51	68.0	0.267	0.605
Educational Level						
Technical school	20	26.7	20	26.7		
Secondary school	55	73.3	55	73.3	0.000	1.000

Table (1) reveals that 50.7% of the study group their age was 20years 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.



***statistically significant differences $P<0.05$**

Figure (1): Comparison of total practice level between study and control group immediately after.

Figure (1) shows that there were highly statistical significant differences between both groups at practical achievement, as the study group achieved higher rate in complete level in perineal care, breast care, and uterine massage checklists at immediately after evaluation (100%,97.3%, 89,3%, respectively) than the control group (86,7%, 70,7%, 61,3%, respectively).

Table 2: Comparison of total Students' achievement in practice between study and control group at follow up.

Items	Study group (n=75)		Control group (n=75)		Chi-Square test	
	N	%	n	%	X ²	P
Perineal Care Domain Practice Level						
Unaccepted Level	2	2.7	9	12.0		
Accepted Level	10	13.3	24	32.0		
Complete Level	63	84.0	42	56.0	14.419	<0.001**
Perineal Care Domain Practice Score						
Mean ±SD	38.9 ±7.8		31.4 ±9.1		5.413	<0.001**
Breast Care Domain Practice Level						
Unaccepted Level	12	16.0	12	16.0		
Accepted Level	16	21.3	38	50.7		
Complete Level	47	62.7	25	33.3	15.685	<0.001**
Breast Care Domain Practice Score						
Mean ±SD	26.3 ±7.0		23.8 ±5.9		2.383	0.018
Uterine Massage Domain Practice Level						
Unaccepted Level	11	14.7	6	8.0		
Accepted Level	10	13.3	26	34.7		
Complete Level	54	72.0	43	57.3	9.829	0.007
Uterine Massage Domain Practice Score						
Mean ±SD	37.2 ±8.9		34.9 ±8.2		1.601	0.111
Total Practice Level						
Unaccepted Level	11	14.7	8	10.7		
Accepted Level	9	12.0	37	49.3		
Complete Level	55	73.3	30	40.0	24.870	<0.001**
Total Practice Score						
Mean ±SD	102.3 ±20.8		90.1 ±15.5		4.096	<0.001**

***statistically significant differences $P<0.05$**

Table (2) displays that there were highly statistical significant differences between both groups at practical achievement, as the study group achieved higher rate in complete level in perineal care, breast care, and uterine massage checklists at follow up evaluation (84.0%,62,7%, 72%, respectively) than the control group (56.0%, 33,3%, 57,3%, respectively).

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

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 and 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: Association between general characteristics of the students and students' practical achievement at

Items	Accepted Level (n=1)		Complete Level (n=74)		Chi-Square test	
	n	%	n	%	X ²	P
Age (Years)						
19	0	0.0	3	4.1		
20	0	0.0	38	51.4		
21	1	100.0	22	29.7		
22	0	0.0	10	13.5		
23	0	0.0	1	1.4	2.291	0.682
Sex						
Male	0	0.0	15	20.3		
Female	1	100.0	59	79.7	0.253	0.615
Marital Status						
Unmarried	1	100.0	66	89.2		
Married	0	0.0	8	10.8	0.121	0.728
Residence						
Urban	0	0.0	27	36.5		
Rural	1	100.0	47	63.5	0.570	0.450
Educational Level						
Technical school	1	100.0	54	73.0		
Secondary school	0	0.0	20	27.0	0.369	0.544

Immediately after intervention for study group (n=75)

Nonsignificant>0.05

Table (4) represents that there is no relation between (age, sex, marital status, residence, and educational level) of the students and their practical achievement at immediately after intervention for study group.

Table 5: Association between general characteristics of the students and students' practical achievement at immediately after evaluation for control group (n=75).

Items	Unaccepted Level (n=1)		Accepted Level (n=19)		Complete Level (n=55)		Chi-Square test	
	N	%	n	%	n	%	X ²	P
Age (Years)								
19	0	0.0	0	0.0	1	1.8		
20	0	0.0	1	5.3	25	45.5		
21	1	100.0	8	42.1	19	34.5		
22	0	0.0	8	42.1	8	14.5		
23	0	0.0	2	10.5	2	3.6	15.132	0.057
Sex								
Male	1	100.0	11	57.9	17	30.9		
Female	0	0.0	8	42.1	38	69.1	5.944	0.051
Marital Status								
Unmarried	1	100.0	14	73.7	52	94.5		
Married	0	0.0	5	26.3	3	5.5	6.570	0.037
Residence								
Urban	1	100.0	4	21.1	19	34.5		
Rural	0	0.0	15	78.9	36	65.5	3.335	0.189
Educational Level								
Technical school	1	100.0	9	47.4	45	81.8		
Secondary school	0	0.0	10	52.3	10	18.2	8.939	0.011*

*statistically significant $P < 0.05$

Table (5) represents that there is statistically significant relation between educational level of the students and their practical achievement at immediately after evaluation for control group.

Table 6: Association between general characteristics of the students and students' practical achievement at follow up evaluation for study group (n=75)

Items	Unaccepted Level (n=11)		Accepted Level (n=9)		Complete Level (n=55)		Chi-Square test	
	N	%	n	%	n	%	X ²	P
Age (Years)								
19	3	27.3	0	0.0	0	0.0		
20	6	54.5	5	55.6	27	49.1		
21	2	18.2	4	44.4	17	30.9		
22	0	0.0	0	0.0	10	18.2		
23	0	0.0	0	0.0	1	1.8	22.674	0.004
Sex								
Male	3	27.3	1	11.1	11	20.0		
Female	8	72.7	8	88.9	44	80.0	0.808	0.668
Marital Status								
Unmarried	10	90.9	8	88.9	49	89.1		
Married	1	9.1	1	11.1	6	10.9	0.034	0.983
Residence								
Urban	4	36.4	3	33.3	20	36.4		
Rural	7	63.6	6	66.7	35	63.6	0.032	0.984
Educational Level								
Technical school	10	90.9	8	88.9	37	67.3		
Secondary school	1	9.1	1	11.1	18	32.7	3.884	0.143

Nonsignificant>0.05.

Table (14) indicates that there is no relation between (age, sex, marital status, residence, and educational level) of the students and their practical achievement at follow up evaluation for study group.

Table 7: Association between general characteristics of the students and students' practical achievement at follow up for control group (n=75)

Items	Unaccepted Level (n=8)		Accepted Level (n=37)		Complete Level (n=30)		Chi-Square test	
	N	%	N	%	n	%	X ²	P
Age (Years)								
19	0	0.0	0	0.0	1	3.3		
20	3	37.5	5	13.5	18	60.0		
21	3	37.5	19	51.4	6	20.0		
22	1	12.5	12	32.4	3	10.0		
23	1	12.5	1	2.7	2	6.7	21.796	0.005
Sex								
Male	1	12.5	15	40.5	13	43.3		
Female	7	87.5	22	59.5	17	56.7	2.640	0.267
Marital Status								
Unmarried	5	62.5	33	89.2	29	96.7		
Married	3	37.5	4	10.8	1	3.3	7.739	0.021
Residence								
Urban	1	12.5	11	29.7	12	40.0		
Rural	7	87.5	26	70.3	18	60.0	2.368	0.306
Educational Level								
Technical school	6	75.0	21	56.8	28	93.3		
Secondary school	2	25.0	16	43.2	2	6.7	11.347	0.03*

*statistically significant P<0.05

Table (7) reveals that there is statistically significant relation between educational level of the students and their practical achievement at follow up for control group

DISCUSSION

Regarding to the General characteristics of the studied students the current finding revealed that more than half of them were 20 years old. In relation to sex, more than two third of the studied students were female. Concerning residence, nearly two third of the studied students from rural area. Regarding marital status, the majority of studied students were single. This finding agrees with [7] 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 reported that the majority of participants were nursing students, between 20 and 21years, single and from rural area.

Regarding practical achievement, the results of this study informed that there were highly statistically significant differences between both groups at practical achievement, as the study group achieved higher rate in complete level in perineal care, breast care, and uterine massage checklists than the control group (p -value ≤ 0.01). from the researcher point of view, the jigsaw strategy is an effective way of transforming the nursing students from passive to active learners. Such active learning method enabled the students to enhance their clinical performance. This result is in agreement with [8] who conducted a study to investigate the effects of laboratory approach based on jigsaw method with cooperative learning and confirmatory laboratory approach on university students' cognitive process development in Science teaching laboratory applications and they found that the effect of laboratory approach based on Jigsaw method on the development of student teachers' scientific process skills is higher than those of confirmatory laboratory approach.

The previous findings were also consistent with [9] who implemented Jigsaw as a cooperative learning model to Improve Students' Cognitive, Affective and Psychomotor domains in learning natural science at grade IX.1of SMP Negeri 7 Sawahlunto in the academic year of 2018/2019. They concluded that the jigsaw type of cooperative learning model that is applied in classroom action research can improve students' competencies in cognitive, affective, and psychomotor domains.

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 [10] 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, [11] 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.

Concerning correlation between general characteristics and practice level of the students, the results of the current study indicated that there was no statistically significant correlation between general characteristics and practice level of the students at immediately after and follow up evaluation for the study group. But there was statistically significant correlation between general characteristics and practice level of the students at immediately after and follow up evaluation for the control group.

CONCLUSION

The results of the study supported the research hypotheses, concluded that jigsaw learning strategy improves the maternity nursing students' practical achievements at immediately after and follow up clinical evaluation with a statistically significant difference. Additionally, students in the study group had positive opinion regarding the use of jigsaw strategy.

RECOMMENDATION

The result of this study projected the following 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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