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Effects of Jigsaw Technique on Learning the Antenatal Abdominal Examination among Nursing Students in the Selected Colleges

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ABSTRACT

The study intends to introduce the jigsaw as a technique on learning the antenatal abdominal examination and it may help to learn easy and retain for a longer time to practice effectively. The objectives of the study aim to assess the knowledge and find out the effectiveness of jigsaw technique among nursing students. Quasi Experimental study. In which one group pretest and posttest is planned for research study. A paired t-test was conducted to assess the statistical significance of the difference in pre- and post-test scores. The results showed a t-value of 16.93 with 59 degrees of freedom, and the p-value was 0. 0001.These findings suggest that the intervention was highly effective in enhancing the knowledge of participants regarding antenatal abdominal examination. The pre-test levels of knowledge of participants regarding jigsaw technique. The half of the samples 31(51.67%) had adequate knowledge, 26(43.33%) were had moderately adequate knowledge and 03(5%) samples were had inadequate knowledge. In the pretest practices among nursing students on jigsaw technique. The majority of the samples 40(66.67%) were had poor practices, 20(33.33%) were had average practices and none of the samples shown good practices. In the pre-test, the mean percentage of knowledge score was 72.33% with mean and SD of 21.70±3.41, the range was 13 - 28 and median was 23. In the pretest the practice scores, the mean percentage was 34.81% with mean and SD of 3.83±1.29. The range was 2-6 scores and median were 4. The results for knowledge showed a t-value of 16.93 with 59 degrees of freedom, and the p-value was 0.0001, which is statistically significant ($p < 0.05$). The results for practices showed a t-value of 40.33 with 59 degrees of freedom, and a p-value of 0.0001, which is statistically significant ($p < 0.05$).

Introduction:

Education is the process of acquiring knowledge, skills, values, and attitudes through teaching, training, or research. It is a fundamental human right and plays a crucial role in personal development, socio-economic progress, and the advancement of society as a whole. The learning process is a complex and dynamic journey through which individuals acquire knowledge, skills, values, and attitudes. It involves a series of cognitive, emotional, and behavioral changes that occur as a result of Interactions with the environment, experiences, and information.[1]

The Jigsaw Technique is a cooperative learning strategy where students are divided into expert groups to become knowledgeable about specific portions of content. Each student in the expert groups focuses on mastering their assigned topic before sharing their expertise with other group members in Jigsaw Groups. Through collaborative learning, students integrate this shared information to construct a comprehensive understanding of the entire content. This approach not only encourages active engagement, critical thinking, and communication skills but also foster cooperation, responsibility, and mutual respect among students. By promoting group interaction and breaking down complex information into manageable parts, the Jigsaw Technique enhances understanding, retention, and overall engagement in the learning process.[2]

The jigsaw method was designed by Aronson et al. in 1978 and modified by Slavin in 1937. In this method, learners are grouped into teams of 3 – 5 to work on a subject that has been divided into different sections. The jigsaw method has a prominent feature over other special collaborative learning method. In this technique, individuals, teams, and experts are part of the discussion or topic that they have selected and are provided with a special opportunity for the training of students to take responsibility and develop critical thinking skills, strengthen self- esteem, reinforce positive attitudes, strengthen self-leadership skills, adopt problem-solving, foster creative and intelligent behaviors, and teach sophisticated social behaviors and other social skills to students.[2]

Hypothesis:

H1: There is a significant increase in the level of knowledge among students after jigsaw learning technique

H2: There is a significant association between the knowledge level of the nursing students with the selected demographic variables.

Methodology:

An evaluative approach was considered appropriate for the study. Data was collected from the 4th year BSc nursing those who are in the age group between 20 - 25 years in selected colleges. Quasi experimental with one group pre-test and post-test design was selected in order to evaluate the effectiveness of jigsaw technique on knowledge and skill regarding antenatal abdominal examination among 4th year BSc nursing of selected nursing college, Bangalore. 60 Sample studying 4th year BSc nursing students were selected by using convenient sampling technique. Jigsaw technique was introduced to the experimental group and posttest was done after a week. Reliability and validity of the tool was found to be r=0.72 and the developed tool were found to be statistically reliable. The pilot study was conducted with the 6 sample and the knowledge showed t value of 6.35 with 5 degree of freedom and the p-value of 0.0001which is statistically significant (p<0.05).

Results: Table 1Frequency and percentage distribution of nursing students according to demographic variables.

n=60

Sr. No	Demographic Variable	Frequency	Percentage
1	Age		
	20-22 Years	54	90
	23-25 Years	06	10
	25-28 Years	00	00
	Above 28 years	00	00
2	Gender		
	Male	11	81.7
	Female	49	18.3
	Other	00	00
3	Year of Study		
	4th Year	60	100
	3rd Year	00	00
4	Religion		
	Hindu	37	61.7
	Muslim	04	6.7
	Christian	19	31.7
	Others		
5	Parent Occupation		
	Government	07	11.7
	Private	15	25.0
	Self-employment	32	53.3
	Others	06	10.0
6	Parent income per month		
	Rs. 20000-30000/-	31	51.7
	Rs. 30001-40000/-	25	41.6

	Rs. 40001-50000/-	03	5.0
	Rs,. 50001 above	01	1.7
7	Resident		
	Own	04	6.7
	Hostel	42	70.0
	Rent	14	23.3
8	Previous Knowledge of Antenatal Abdominal Examination		
	Yes	58	96.7
	No	02	3.3
9	If Yes, Source of Previous Knowledge		
	Classroom lecture	33	55
	Clinical Posting	26	43.3
	Self-study	01	1.7
10	Interest in Obstetrics Nursing		
	Yes	60	100
	No		
11	Experience in Conducting Antenatal Abdominal Examinations		
	Yes	58	96.7
	No	02	3.3
12	Number of antenatal abdominal examinations performed		
	None	14	23.3
	Once	46	76.7
	Twice		
	More than twice		
13	Participation in Group Learning Activities (e.g., Jigsaw, Peer Learning)		
	Yes	22	36.7
	No	38	63.3

The majority of participants 54(90%) were aged between 20 to 22 years, while 6(10%) were between 23 to 25 years. There were no participants in the 25–28 years or above 28 years categories. The majority of the participants were female, comprising 49(81.7%), while males accounted for 11(18.3%). There were no participants who identified as other genders. All participants 60(100%) were in their 4th year of study, with no representation from other academic years. A majority of participants were Hindu 37(61.7%), followed by Christians 19(31.7%), and Muslims 04(6.7%). No participants identified with other religions. More than half of the participants 32(53.3%) reported that their parents were self-employed. Others indicated their parents worked in private jobs 15(25.0%), government jobs 07(11.7%), or other occupations 06(10.0%).Most participants 31(51.7%) reported a parental monthly income between Rs. 20,000–30,000, followed by 25(41.6%) with an income between Rs. 30,001–40,000.

A small percentage 3(5.0%) reported income between Rs. 40,001–50,000, and only one participant 01(1.7%)

reported income above Rs. 50,001. Majority of participants (70%, n = 42) were residing in hostels. A smaller portion lived in rented accommodations (23.3%, n = 14), while only 6.7% (n = 4) lived in their own homes. Most participants 58(96.7%) reported having prior knowledge of antenatal abdominal examinations, whereas only 2(3.3%) indicated they did not have such knowledge. Among those with prior knowledge (58), the majority cited classroom lectures as their source 33(55%), followed by clinical postings 26(43.3%). Only one participant (1.7%) gained knowledge through self-study. All participants 60(100%) expressed interest in obstetrics nursing, with no one indicating a lack of interest. A significant majority 58(96.7%) had prior experience in conducting antenatal abdominal examinations, while only 2(3.3%) had no such experience. Most participants 46(76.7%,) had performed an antenatal abdominal examination once. The remaining 14(23.3%) had not performed any. No participants reported performing the procedure twice or more than twice. A greater proportion of participants 38(63.3%,) had not participated in group learning activities, while 22(36.7%) reported participation in such activities.

Table No. 2: Classification of participants according to levels of knowledge regarding jigsaw technique.

Sl. No	Level of knowledge	Pre test	
		Number	Percentage
1.	Inadequate knowledge (≤50%)	03	5.00
2.	Moderate adequate knowledge (51-74%)	26	43.33
3.	Adequate Knowledge (75%)	31	51.67

The above table describe the pre-test levels of knowledge of participants regarding jigsaw technique. The half of the samples 31(51.67%) had adequate knowledge, 26(43.33%) were had moderately adequate knowledge and 03(5%) samples were had inadequate.

Table No. 3: Classification of participants according to levels of practices regarding jigsaw technique.

Sl. No	Level of Practices	Pre test	
		Number	Percentage
1.	Poor practices (≤50%)	40	66.67
2.	Average Practices (51-74%)	20	33.33
3.	Good Practices (75%)	00	00

The above table describes the pretest practices among nursing students on jigsaw technique. The majority of the samples 40(66.67%) were had poor practices, 20(33.33%) were had average practices and none of the samples shown good practices.

Table No.4 Mean, SD and Mean% of pretest knowledge and practice scores of participants regarding jigsaw technique for abdominal examination.

Sr. No	Aspects	Max Score	Range	Median	Mean	SD	Mean %
1	Knowledge Scores	30	13-28	23	21.70	3.41	72.33
2	Practice Scores	11	2-6	4	3.83	1.29	34.81

The above table describes the pretest test knowledge and practice scores, in the pre-test, the mean percentage of knowledge score was 72.33% with mean and SD of 21.70±3.41, the range was 13 - 28 and median was 23. In the pretest the practice scores, the mean percentage was 34.81% with mean and SD of 3.83±1.29. The range was 2-6 scores and median were 4.

Table No 5 Mean, SD and Mean% of post-test knowledge and practice scores of participants regarding jigsaw technique for abdominal examination.

Sr. No	Aspects	Max Score	Range	Median	Mean	SD	Mean %
1	Knowledge Scores	30	26-30	29	29.18	1.01	97.26
2	Practice Scores	11	10-11	11	10.55	0.50	95.90

The above table describes the pretest test knowledge and practice scores, in the post test, the mean percentage of knowledge score was 97.26% with mean and SD of 29.18±1.01, the range was 26-30 and median was 29. In the pretest the practice scores, the mean percentage was 95.90% with mean and SD of 10.55±0.50. The range was 10-11 scores and median was11.

Table No. 6. Effectiveness of jigsaw technique on learning the antenatal abdominal examination.

n=60

Sr. No	Knowledge	Mean	SD	Mean %	Paired T test
1	Pre test	21.70	3.41	72.33	16.93, df=59, p=0.0001, S*
2	Post test	29.18	1.01	97.26	
3	Difference	7.48	3.42	24.93	

A paired t-test was conducted to assess the statistical significance of the difference in pre- and post-test scores. The results showed a t-value of 16.93 with 59 degrees of freedom, and the p-value was 0.0001, which is statistically significant ($p < 0.05$), denoted as S*.

These findings suggest that the intervention was highly effective in enhancing the knowledge of participants regarding antenatal abdominal examination.

Table No.7. Effectiveness of jigsaw technique on learning the antenatal abdominal examination on practices.

Practice Scores Before and After the

Sr. No	Practices	Mean	SD	Mean %	Paired T test
1	Pre test	3.83	1.29	34.81	40.33, df=59, p=0.0001, S*
2	Post test	10.55	0.50	95.90	
3	Difference	6.71	1.29	61.09	

Intervention

A paired t-test was performed to determine the significance of this difference. The results showed a t-value of 40.33 with 59 degrees of freedom, and a p-value of 0.0001, which is statistically significant ($p < 0.05$), denoted as S*.

Table No. 8 Comparison of pretest and posttest knowledge regarding antenatal abdominal examination among the nursing students.

Sl. No	Level of knowledge	Pre test		Post Test	
		Frequency	Percentage	Frequency	Percentage
1.	Inadequate knowledge (≤50%)	03	5.00	00	00
2.	Moderate adequate knowledge (51-74%)	26	43.33	00	00
3.	Adequate Knowledge (75%)	31	51.67	60	100

The above table compares the pretest and post – post test levels of knowledge. In the pretest the half of the samples i.e 31(51.67%) were had adequate knowledge, 26(43.33%) were had moderately adequate knowledge and 03(5%) were had inadequate knowledge where as in the post test all 60(100%) of the students were had adequate knowledge.

Table No. 9. Comparison of pretest and posttest knowledge regarding antenatal abdominal examination among the nursing

students.

Sl. No	Level of Practices	Pre test		Post test	
		Frequency	Percentage	Frequency	Percentage
1.	Poor practices (≤50%)	40	66.67	00	00
2.	Average Practices (51-74%)	20	33.33	00	00
3.	Good Practices (75%)	00	00	60	100

The above table describes the pretest and post-test levels of practice scores. In the pretest majority 40(66.67%) were had poor practices, 20(33.33%) were had average practices and none of them had good practices. In the posttest all 60(100%) samples had good practices.

Table No.10 Association between the pretest knowledge score with selected demographic variables.

Sl. No	Variables	Categories	F	Knowledge Score				χ^2 Value
				Median		Median		
				F	%	F	%	
1	Age in years	20-22 Years	54	26	48.15	28	51.85	3.21, df=1, p=0.73, NS
		23-25 Years	06	3	50.00	3	50.00	
2	Gender	Male	11	8	72.73	3	27.27	3.21, df=1. P=0.73, NS
		Female	49	21	42.86	28	57.14	
3	Year of Study	4th Year	60	29	48.33	31	51.67	Chi Square cannot be calculated
		3rd Year	00					
4	Religion	Hindu	37	20	54.05	17	45.95	1.652, df=2, p=0.438, NS
		Muslim	04	1	25.00	3	75.00	
		Christian	19	8	42.11	11	57.89	
5	Parent Occupation	Government	07	5	71.43	2	28.57	4.330, df=3, p=0.363, NS
		Private	15	6	40.00	9	60.00	
		Self-employment	32	15	46.88	17	53.13	
		Others	06	3	50.00	3	50.00	
6	Parent income per month	Rs. 20000-30000/-	31	14	45.16	17	54.84	2.56, df=4, p=0.634, NS
		Rs. 30001-40000/-	25	12	48.00	13	52.00	
		Rs. 40001-50000/-	03	2	66.67	1	33.33	
		Rs,. 50001 above	01	1	100.00	0	0.00	

Table No. 11 Association between the pretest knowledge score with selected demographic variables.

Sl. No	Variables	Categories	F	Knowledge Score				χ^2 Value
				Median		Median		
				F	%	F	%	
7	Resident	Own	04	1	25.00	3	75.00	2.46, df=3, p=0.292, NS
		Hostel	42	23	54.76	19	45.24	
		Rent	14	5	35.71	9	64.29	
8	Previous Knowledge of Antenatal Abdominal Examination	Yes	58	27	46.55	31	53.45	2.12, df=1, p=0.13, NS
		No	02	2	100.00	0	0.00	
9	If Yes, Source of Previous Knowledge	Classroom lecture	33	16	48.48	17	51.52	1.19, df=2, p=0.57, NS
		Clinical Posting	26	12	46.15	14	53.85	
		Self-study	01	1	100.00	0	0.00	
10	Interest in Obstetrics Nursing	Yes	60	29	48.33	31	51.67	Chi square test cannot be calculated
		No	00	0		0		
11	Experience in Conducting Antenatal Abdominal Examinations	Yes	58	27	46.55	31	53.45	2.12, df=1, p=0.13, NS
		No	02	2	100.00	0	0.00	
12	Number of antenatal abdominal	None	14	7	50.00	7	50.00	0.20, df=1,

	examinations performed	Once	46	22	47.83	24	52.17	p=0.887, NS
13	Participation in Group Learning Activities)	Yes	22	10	45.45	12	54.55	1.143, df=1, p=0.56, NS
		No	38	19	50.00	19		

The chi square test was calculated to find the association between the pre test knowledge scores, the obtained chi square values with respect to the degree of freedom, the pa values were greater than 0.05, hence there were no any demographic variables found associated with demographic variables.

Conclusion: The implementation of the jigsaw technique suggests that active, student-centered teaching methods are highly effective in enhancing learning outcomes in nursing education. Nurse educators should be encouraged to incorporate the jigsaw technique into clinical and theory-based teaching, particularly for skill-based topics such as antenatal abdominal examination. This can lead to better retention, understanding, and practical application of clinical skill.

Conclusion: The study had found that the Jigsaw method is a very useful and can be very well adopt, especially when the procedures like mechanism of labor, fetal skull, female pelvis to be learned in a very short period of time.

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