

JİGSAW TEKNİĞİ İLE HEMŞİRELİK ÖĞRENCİLERİNİN GESTASYONEL HİPERTANSİYON KONUSUNU ÖĞRENMELERİ VE TEKNİĞE İLİŞKİN GÖRÜŞLERİNİN İNCELENMESİ: YARI DENEYSEL BİR ARAŞTIRMA

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ÖZET

Anahtar Kelimeler

- Gestasyonel hipertansiyon,
- Sağlık,
- Jigsaw tekniği,
- Hemşirelik eğitimi.

Makale Hakkında

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Amaç: Bu çalışma, Jigsaw Tekniği kullanılarak verilen gebelik hipertansiyonu eğitiminin hemşirelik öğrencilerinin gebelik hipertansiyonuna ilişkin anket puanları üzerindeki etkisini değerlendirmeyi ve öğrencilerin Jigsaw Tekniği hakkındaki görüş ve tutumlarını belirlemeyi amaçlamaktadır.

Yöntem: Çalışma yarı deneysel olarak yürütülmüştür. Çalışmanın evrenini 3. sınıf hemşirelik öğrencileri (n=62), örneklemini ise kadın sağlığı ve hastalıkları hemşireliği dersine katılan 60 öğrenci oluşturmuştur; örneklem hesaplaması yapılmamıştır. Çalışma verileri Kişisel Bilgi Formu, Gebelik Hipertansiyonu Anketi ve Jigsaw Görüş Ölçeği ile toplanmış ve IBM SPSS (SPSS INC Statistics for Windows, Version 25.0, Chicago, IL, USA) paket programı aracılığıyla analiz edilmiştir.

Bulgular: Katılımcıların %73,3'ü kadın olup, yaş ortalaması 20,65±2,64'tür. Ortalama akademik başarı puanı 76,48±5,16 olarak bulunmuştur. Jigsaw Görüş Ölçeği ortalaması 53,23±11,38 (Cronbach's $\alpha = .92$) olup, öğrencilerin yanıtlarına göre Jigsaw tekniği genel olarak olumlu değerlendirilmiştir. Müdahale sonrasında Gebelik Hipertansiyonu Anketi ortalama puanı 48,66±14,10'dan 69,00±10,03'e anlamlı şekilde artmıştır. Bu artış, anket maddelerine verilen yanıtlar doğrultusunda öğrencilerin performans puanlarının yükseldiğini göstermekte olup, kullanılan anketin standardize bir bilgi ölçme aracı olmaması nedeniyle bilgi düzeyindeki artışın kesin bir göstergesi olarak yorumlanamaz. Post-hoc güç analizi (G*Power 3.1.9.2) ile hesaplanan etki büyüklüğü $d_z = 1.56$ ve test gücü 1.00 olarak bulunmuştur.

Sonuç: Jigsaw tekniği, aktif öğrenmeyi ve iş birliğini teşvik etmekte ve öğrenciler tarafından olumlu olarak değerlendirilmektedir. Eğitim süreci sonrasında anket puanlarında gözlenen artış, öğrencilerin ele alınan konuya ilişkin performanslarında bir iyileşme olduğunu göstermektedir. Bu doğrultuda, Jigsaw yönteminin hemşirelik eğitiminde ve kadın sağlığı derslerinde destekleyici ve etkili bir öğretim yaklaşımı olarak kullanılabilirliği düşünülmektedir.

INVESTIGATION OF NURSING STUDENTS' LEARNING THE SUBJECT OF GESTATIONAL HYPERTENSION WITH JIGSAW TECHNIQUE AND THEIR OPINIONS ON THE TECHNIQUE: A QUASI- EXPERIMENTAL RESEARCH

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ABSTRACT

Keywords

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Aim: This study aims to evaluate the effect of gestational hypertension education using the Jigsaw Technique on nursing students' questionnaire scores related to gestational hypertension and to determine their opinions and attitudes toward the Jigsaw Technique.

Methods: This study is a quasi-experimental study. The universe of the study was the 3rd year nursing students (n=62), and the sample was 60 students who attended the women's health and diseases nursing course without any sample calculation. The study data were collected with the Personal Information Form, Gestational Hypertension Questionnaire and Jigsaw Opinion Scale and were analyzed using the IBM SPSS software package (SPSS INC Statistics for Windows, Version 25.0, Chicago, IL, USA).

Results: 73.3% of the participants were female, with a mean age of 20.65±2.64 years. The average academic success score was 76.48±5.16 points. The mean Jigsaw Opinion Scale score was 53.23±11.38 points (Cronbach's $\alpha = .92$). According to the students' responses, the Jigsaw technique was generally perceived positively. Following the intervention, the mean Gestational Hypertension Questionnaire score significantly increased from 48.66±14.10 to 69.00±10.03 points, indicating an increase in students' scores obtained from the questionnaire. Given that the questionnaire is not a standardized knowledge measurement tool, this increase reflects improved performance on the questionnaire items rather than a definitive increase in knowledge level. The effect size $d_z = 1.56$ and test power 1.00 were calculated using post-hoc power analysis (G*Power 3.1.9.2).

Conclusion: The Jigsaw technique promotes active learning and collaboration and was evaluated positively by students. The post-intervention increase in questionnaire scores indicates an improvement in students' performance regarding the content addressed during the educational process. Accordingly, the Jigsaw method may be considered a supportive and effective instructional approach in nursing education and women's health courses.

INTRODUCTION

High-risk pregnancies are a significant health problem that threatens both maternal and fetal health. Approximately 22% of all pregnancies worldwide are considered high risk (1). Failure to effectively manage such pregnancies is among the main causes of maternal and fetal loss in both developed and developing countries (2). Factors leading to high risk pregnancies include chronic diseases such as diabetes and hypertension, infections, complications experienced in previous pregnancies, and problems that may arise during pregnancy (placental abruption, placenta previa, etc.) (3). In this context, gestational hypertension (GHT) is one of the leading causes of high-risk pregnancies and stands out as an important factor in maternal deaths worldwide (4). Preeclampsia, in particular, is seen in 2- 4% of all pregnancies and causes approximately 46,000 maternal deaths and 500,000 fetal/newborn deaths annually (5). In Turkey, 13.7% of maternal deaths were associated with high-risk pregnancies (6). These data clearly demonstrate the importance of mortality rates caused by high-risk pregnancies.

Providing appropriate and timely nursing care to prevent or manage risks to the mother and fetus in high-risk pregnancies is critical. Therefore, effective teaching of high risk pregnancies in obstetric and women's health nursing courses is essential to prepare future health professionals for such situations. Increasing the knowledge and skill levels of nursing students through these courses will contribute to the adoption of comprehensive care approaches that will improve maternal and fetal health. Developments in nursing science and health technologies have brought about changes in teaching methods used in nursing education. Traditional methods have been abandoned and student-centered approaches that provide more active participation of students have come to the fore. In this context, the cooperative learning method is considered an important teaching strategy in nursing education processes. Cooperative learning is based on students coming together in small groups to collaborate to achieve a common learning goal (7,8). This approach aims to bring together individuals with different abilities and knowledge levels to share information and contribute to each other's learning processes. The Jigsaw Technique, one of the cooperative learning strategies, is a method that involves dividing the subject into subsections and having each student specialize in a certain area and then transferring this knowledge to their group mates (9).

Although there is evidence in the literature that the Jigsaw Technique is effective in high school and university education (10), data on its use in the context of nursing education is limited (11,12). The effects of the Jigsaw Technique, especially in teaching specific topics such as GHT, have not yet been sufficiently investigated.

This study aims to evaluate the effect of gestational hypertension education using the Jigsaw Technique on nursing students' knowledge levels and to determine their opinions and attitudes toward the Jigsaw Technique. It is thought that the findings obtained in this context will contribute to the literature on the effectiveness of cooperative learning methods in nursing education.

METHOD

Study Design

The research was conducted as a pre- test, post- test, A Quasi- Experimental Research.

Sample Selection

The universe of the study consisted of 3rd year students (n=62) of a university nursing department, and the sample consisted of 60 students who attended the women's health and diseases nursing course without any sample calculation.

Research Inclusion Criteria

- Being a 3rd year nursing student
- Being educated at a relevant university
- Taking a women's health and disease nursing course
- Being volunteer to participate in the research

Study Tools

Research data were collected using the Personal Information Form, Gestational Hypertension Questionnaire and Jigsaw Opinion Scale.

Personal Information Form: There are 6 questions including age, gender, the place where he/she has lived the longest, general academic average, how many hours he/she studies per day and whether he/she has worked with the jigsaw technique before.

Gestational Hypertension Questionnaire: The study used the 20-item "Gestational Hypertension Questionnaire," developed by the authors (1, 4, 13, 14) based on literature review and expert opinions. This form is not a standardized measurement scale. Internal consistency analysis yielded a Cronbach's alpha coefficient of 0.82, and item-total correlation coefficients ranged between 0.31 and 0.67. Although these findings indicate acceptable internal consistency, no construct validity or factor analysis was conducted. Therefore, the questionnaire does not provide a definitive measurement of knowledge level but allows for a descriptive evaluation of students' responses to the content addressed during the educational process. The total score reflects students' performance on the questionnaire items rather than a validated knowledge construct.

Jigsaw Opinion Scale: A form prepared by Şimşek (2007) was used to determine students' opinions about the Jigsaw technique (15) . The scale consists of 15 items, 14 closed ended and one open ended . The first 14 closed-ended items are five-point Likert type. The fifteenth open-ended item was created to determine students' positive and negative opinions about the Jigsaw technique. The highest score that can be obtained from the scale is 70. As the score obtained

from the scale increases, it is concluded that the student has a positive opinion about the Jigsaw technique. The Cronbach's alpha value of the original scale was 0.83. In our study, the Cronbach's alpha value was found to be 0.92.

Data Collection

In the implementation phase of the research, in accordance with the learning objectives of the subject of gestational hypertension, 6 subheadings were determined as classification of gestational hypertension, etiology and risk factors, physiopathology, signs and symptoms, diagnosis, treatment and care (13,14). Six groups of 10 people were randomly formed by counting method. The students in this group were called the expert group. After the method was explained to the students, a pre-test was applied. The pre test lasted approximately 25 minutes. At the end of the pre test, the students completed their work on the subject in approximately 30 minutes. Then, the expert groups sat down opposite each other and discussed the subject they were responsible for for approximately 60 minutes. After the expert group discussion was over, one student was added from each group so that there would be at least one expert group member in each group, creating 10 different mixed groups of 6 people (Figure 1). These mixed groups were called peer advisor groups. All members in the peer advisor group explained their subjects in the expert groups to their peers and answered their questions for 60 minutes. A post-test was applied to the students to evaluate the effectiveness of the Jigsaw technique and their opinions about the method were evaluated with the Jigsaw opinion scale.

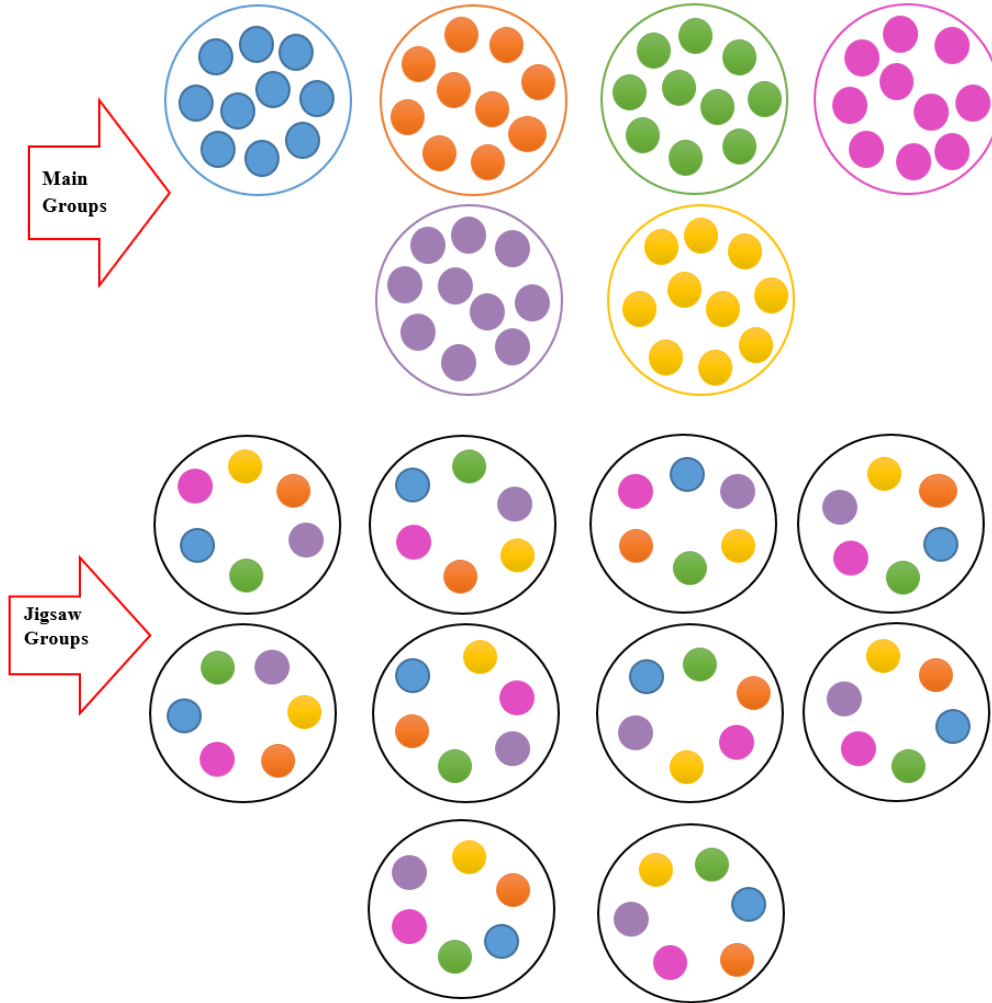


Figure 1. The topic of hypertensive conditions in pregnancy and groups with subtopics.

Data Analysis

The data were analyzed using the IBM SPSS software package (SPSS INC Statistics for Windows, Version 25.0, Chicago, IL, USA). Descriptive statistics (mean, standard deviation, median, minimum–maximum values, and interquartile range) were used to summarize sociodemographic characteristics and scale scores. Normality of continuous variables was assessed using skewness–kurtosis values and visual inspection methods. The comparison of pre-test and post-test questionnaire scores was performed using the paired samples t-test, as normality assumptions were met. Effect size was calculated using Cohen’s *d*. Post-hoc power analysis was conducted using the G*Power 3.1.9.2 software based on the paired samples t-test results, specifying the observed effect size, $\alpha = 0.05$, and sample size (16). For the Jigsaw Opinion Scale, internal consistency reliability was assessed using Cronbach’s alpha coefficient, which was reported prior to presenting the scale findings. Qualitative data obtained from the open-ended item were analyzed through content analysis, and responses were categorized into

themes by the researchers.

Ethical Aspect

In order to conduct the research, permission was obtained from Tokat Gaziosmanpaşa University Social and Human Sciences Research Ethics Committee dated 26.11.2024 and numbered 19.17. Permission was obtained from the relevant institution, and both written and verbal consents were secured from the participating students.

RESULTS

The findings regarding the students' sociodemographic characteristics and academic success are given in Table 1. The majority of the students are female (73.3%), and their average age is 20.65 ± 2.64 years. The place where they have resided the longest is the district (76.7%). It was determined that the majority of their daily study hours were less than 1 hour (65.0%), and their academic success average score was 76.48 ± 5.16 points (Table 1).

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Table 1. Demographic characteristics of the participants.

Variables	n	%
Gender		
Male	16	26.7
Female	44	73.3
Place where people live the longest		
Province	14	23.3
District	46	76.7
Daily working hours		
< 1 hour	39	65.0
1- 4 hours	21	35.0
Previous experience working with Jigsaw technique		
Yes	2	3.3
No	58	96.7
	Mean\pmSD	
Average age	20.65 \pm 2.64	
Students' general success grade point average	76.48 \pm 5.16	

Participants' scores on the Self- description Scale ranged from 1 to 10, with a mean of 6.28 ± 2.31 , a median of 7.00, and interquartile values of $Q1 = 4.25$ and $Q3 = 8.00$. These results indicate that, although the average score reflects a tendency toward extraversion, the wide range of responses suggests that the group included students who identified as both introverted and highly extroverted. Scores on the Jigsaw Opinion Scale ranged from 24 to 70, with a mean of 53.23 ± 11.39 , a median of 53.00, and interquartile values of $Q1 = 49.00$ and $Q3 = 61.75$. Reporting both the mean \pm standard deviation and the median with interquartile ranges provides a more accurate representation of score dispersion for both scales, particularly given the high variability observed (coefficient of variation > 20%) (Table 2).

Table 2. Findings regarding the Jigsaw opinion scale.

Scale	N	Minimum	Q1	Median	Q3	Maximum	Mean ± SD
Self- description Scale*	60	1	4.25	7.00	8.00	10	6.28 ± 2.31
Jigsaw Opinion Scale Scoring	60	24	49.00	53.00	61.75	70	53.23 ± 11.39

*Evaluated on a scale from 1 to 10. 1- indicates introvert, 10- indicates extrovert.

When comparing participants' pre-test and post-test scores on the Gestational Hypertension Questionnaire, it was found that post-test scores (69.00 ± 10.03) were significantly higher than pre-test scores (48.67 ± 14.11) ($t = 12.102$, $p < .001$). The mean difference was 20.33 ± 13.01 . This finding indicates an increase in students' scores obtained from the questionnaire following the educational intervention.

Given that the questionnaire is not a standardized knowledge measurement tool, the observed increase should be interpreted as an improvement in students' performance on the questionnaire items rather than a definitive increase in knowledge level.

The effect size was calculated as $d_z = 1.56$. Post-hoc power analysis performed using G*Power 3.1.9.2 demonstrated a test power of 1.00, indicating sufficient sensitivity to detect the observed score difference (Table 3).

Table 3. Gestational hypertension questionnaire.

Gestational Hypertension Questionnaire	Minimum points	Maximum points	Mean ± SD	t	df	p
Pre-test score average	20	75	48.67 ± 14.11			
Post-test score average	45	90	69.00 ± 10.03			
Difference between pre-test and post-test	25	15	20.33 ± 13.01	12.102	59	< 0.001

*A paired t-test was applied. $p < 0.05$

Table 4 presents the positive and negative aspects of the Jigsaw technique. While the technique offers advantages such as strengthening social interaction, establishing communication, taking responsibility, and arousing curiosity and interest, it also contributes to the development of research skills and the support of permanent learning. On the other hand, negative aspects such as loss of time, distraction, time limitation, and sound intensity reflect some difficulties related to the technique. In addition, conflicts within the group, not all participants showing the same dedication, and decreased communication with the instructor are other factors that limit the effectiveness of the technique. Students generally evaluated the Jigsaw activity positively. The most frequently mentioned positive aspects were its communication-enhancing effect (23.3%), its more lasting and instructive nature (15.0%), and the assumption of responsibility (11.7%). Negative opinions were rare, with 38.4% of students reporting no negative experiences (Table 4).

Table 4. Students' opinions on the jigsaw technique*.

Positive	n	%	Negative	n	%
Has a communication strengthening effect	14	23.3	Not indicating a negative situation	23	38.4
More permanent and educational	9	15.0	Possibility of missing some information	6	10.0
Taking responsibility	7	11.7	Time constraints	5	8.3
Allows for the exchange of ideas	5	8.3	Inability to grasp the subject	5	8.3
Encouraging careful learning	5	8.3	Time loss	4	6.7
Learning the whole thing with a single topic study	4	6.7	Sound intensity	3	5.0
Enjoyable and exciting	4	6.7	Conflicts within the group	3	5.0
Increasing interest in the lesson	3	5.0	Failure to provide a suitable environment	3	5.0
Developing research skills	3	5.0	Headache and tiring	2	3.3
Like a social activity	3	5.0	Decreased communication with the teacher	2	3.3
Increasing the sense of curiosity	2	3.3	Decreased attention level	2	3.3
Something surprising	1	1.7	Not everyone has the same dedication	1	1.7
			Papers mixed up	1	1.7
Total	60	100	Total	60	100

* Student opinions were categorized and tabulated.

DISCUSSION

In this study, 73.3% of the students were female, with an average age of 20.65 ± 2.64 years. In another study conducted on nursing students using the Jigsaw technique, the mean age was reported as 21.89 ± 7.69 years, and again the majority (66.10%) were female. In addition, most of the students (96.7%) stated that they worked with this technique for the first time. In the study conducted by Tanrıku et al. (2018) with the Jigsaw technique, the general academic grade point average of the students was 2.32 ± 0.51 (60.80 points according to the 100-point system); in our study, the academic grade point average was higher with 76.48 ± 5.16 points (17). This difference may be attributed to variations in the grading systems of universities or the academic performance levels of the participants.

The findings obtained in our study reveal that the participants generally have a positive approach to the Jigsaw technique. One of the main strengths of this study is the use of the Jigsaw technique, which promotes active student participation and encourages collaborative and learner-centered education. This approach enhanced students' communication, cooperation, and responsibility skills, making the learning process more interactive and dynamic. Moreover, data were collected directly from students' experiences, providing a unique and authentic insight into their perceptions of the method. However, it should be noted that the Gestational Hypertension Questionnaire used in this study is not a standardized knowledge measurement tool. Therefore, increases observed in pre-test and post-test scores reflect improvements in students' performance on the questionnaire items rather than a definitive increase in knowledge.

level. The facilitative guidance of the instructor during the process helped students adapt more easily and contributed to maintaining motivation and engagement. These factors increase the educational value and practical relevance of the study, offering useful implications for the integration of cooperative learning strategies in nursing curricula.

In a study conducted on the Jigsaw learning strategy among students taking women's health and obstetric nursing courses, it was found that students reported more positive feedback following the implementation compared to the pre-application period (18). Another study demonstrated that the Jigsaw learning method contributed to improvements in student achievement, retention, and self-confidence in women's health and obstetrics nursing education (19). The present study is consistent with these findings in terms of students' positive perceptions and increased engagement with the learning process, although differences in measurement tools limit direct comparison of outcome magnitudes.

Previous studies have consistently reported that the Jigsaw learning method supports nursing students' academic achievement and contributes to the development of key competencies such as interpersonal communication, critical thinking, collaboration, and clinical skills when compared to traditional teaching approaches (18–23). In line with the literature, students in the present study expressed favorable opinions regarding the method, particularly emphasizing its role in enhancing communication, responsibility, and interest in the subject matter.

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In this study, the positive and negative aspects of the Jigsaw technique were explored from the students' perspective. The technique was appreciated for fostering social interaction, making learning more engaging and enjoyable, strengthening communication, and supporting research skills. Nevertheless, challenges such as time constraints, distraction, unequal participation, conflicts within groups, and reduced communication with the instructor were also reported. Similar challenges have been noted in previous studies, although negative findings have been reported less frequently in the literature (20,21,24,25). These findings suggest that while the Jigsaw technique offers substantial pedagogical benefits, its effectiveness may be influenced by factors such as classroom management, group dynamics, and instructional planning.

Limitations

Despite its strengths, this study has several limitations that should be acknowledged. First, it was conducted with a relatively small sample of nursing students from a single university, which restricts the generalizability of the findings. Moreover, potential confounding factors such as group dynamics, time management, individual motivation, and learning styles were not controlled and may have influenced the outcomes. Because the study relied on self-reported measures, the data may also be subject to social desirability bias. In addition, the short duration of the intervention limited the ability to evaluate the long-term effects of the Jigsaw technique on students' learning and attitudes. Future research should employ larger, multicenter samples and longitudinal designs to more comprehensively assess the sustained educational impact of this method.

CONCLUSION

The nursing profession plays a critical role in the healthcare system, and effective nursing education is essential for developing professional competencies. Cooperative learning methods, such as the Jigsaw technique, promote active student participation, critical thinking, problem-solving, and academic success. Evidence from nursing education studies shows that the Jigsaw method also enhances self-confidence, communication skills and motivation. These findings highlight the method's applicability and benefits, suggesting that it should be more widely implemented in nursing programs in our country.

Conflict of Interest

There is no conflict of interest between the authors

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