Original Article

The Influence of the Jigsaw Learning Method Using Word Square Evaluation Media on the Understanding of Patient Safety in Nursing Students

Levya Afriliza Permana Putri[1], Suci Noor Hayati[1], Eva Supriatin[1], Tri Antika Rizki K.P.[1], Lia Juniarni[1]

[1]Department of Nursing, Faculty of Professional Nursing, STIKep PPNI Jawa Barat, Bandung, Indonesia

Abstract

Background : Understanding patient safety is crucial for nursing students to prevent incidents and reduce adverse events during clinical practice. The jigsaw learning method combined with word square evaluation is an effective and interactive approach to enhance students' understanding, proving more beneficial than conventional teaching methods.

Objective : This study aimed to assess the impact of the Jigsaw learning method with Word Square evaluation media on nursing students' understanding of patient safety.

Method A quantitative study was conducted using a quasi-experimental design with a control group, pre-test, and post-test. The sample consisted of 40 Level I nursing students, selected through simple random sampling. Data were collected using a knowledge and understanding questionnaire.

Results The intervention group, which received education using the Jigsaw learning method with Word Square evaluation media, showed significant improvement in understanding patient safety. Statistical analysis using the Wilcoxon signed-rank test indicated a significant difference (p = 0.000), and the Mann-Whitney test also confirmed a significant difference between the intervention and control groups (p = 0.000).

Conclusion: The Jigsaw learning method with Word Square evaluation media significantly enhances nursing students' understanding of patient safety. This method can be implemented as an effective learning strategy at STIKep PPNI Jawa Barat.

Keyword : Jigsaw, Word Square, Comprehension, Patient Safety

INTRODUCTION

Patient safety is a system aimed at providing safe care in hospitals to prevent injuries or adverse events caused by medical errors (1). Nurses play a vital role in ensuring patient safety through continuous 24-hour care (2). In the context of nursing education, student competencies which include knowledge, skills, and attitudes are essential in preventing safety incidents and reducing the number of adverse events (3).

However, several studies have shown that nursing students' understanding of patient safety remains suboptimal. For instance, Iswati as cited in Riada (2) reported that student understanding of proper patient identification was only 32%, effective communication 61%,

and appropriate treatment administration 59%. This indicates a gap between expectations and reality in how patient safety is taught in nursing education institutions (4).

Patient safety education often still relies on conventional teaching methods that do not actively engage students. To address this issue, the Student-Centered Learning (SCL) approach has emerged as an effective strategy, as it places students at the core of the learning process (5). One effective form of SCL is Cooperative Learning, particularly the Jigsaw method. In this method, students are responsible for learning specific material and teaching it to their group members (6). This approach has been proven to enhance conceptual understanding and communication skills. Evaluation in the Jigsaw method can be enriched with interactive tools such as the *Word Square (7)*. This medium resembles a word puzzle containing hidden terms related to the learning material. In addition to being engaging and motivational, *Word Square* is effective in measuring students' comprehensive understanding (8). The combination of the Jigsaw method and *Word Square* evaluation offers the potential to create a more active, collaborative, and meaningful learning environment (9,10).

Although some studies have examined the effectiveness of the Jigsaw method, few have specifically explored its combination with *Word Square* media in the context of patient safety education. Therefore, further research is needed to address this gap. This study aims to examine the effect of the Jigsaw learning method combined with Word Square evaluation media on nursing students understanding of patient safety.

METHODS

Study Design

This study employed a quantitative approach with a quasi-experimental design, specifically a pretest-posttest control group design. The research was conducted at STIKep PPNI Jawa Barat with a total sample of 40 first-year nursing students, selected using simple random sampling. The students were randomly divided into two groups: 20 students in the intervention group and 20 in the control group.

Procedur

The intervention group received patient safety education through the Jigsaw learning method combined with Word Square evaluation media. The intervention was carried out over three sessions, each lasting 90 minutes, across one week. The Jigsaw method involved dividing students into small "expert" groups to study specific subtopics, followed by regrouping into "home" groups to teach one another. Each session concluded with a Word Square activity, an interactive crossword puzzle with disguised letters/numbers. The Word Square evaluation sheet consisted of 10 questions about patient safety goals. The control group received patient safety material through conventional lecture-based teaching, without interactive group activities or Word Square media. The independent variable in this study was the Jigsaw learning method with Word Square evaluation media, while the dependent variable was the nursing students understanding of patient safety.

Data Collection

Data were collected using a structured questionnaire on knowledge and understanding of patient safety, which was developed by Notoatmodjo (11) and modified by Tika Huswaitun (12) to focus on patient safety goals. The questionnaire consisted of 25 true/false questions, and respondents were also provided with a Word Square evaluation containing 10 questions. The instrument underwent expert validation and achieved a Cronbach's alpha score of 0.853, indicating good reliability. For data analysis, the Wilcoxon Signed Ranks Test was used to measure pretest and posttest differences within each group, while the Mann-Whitney U Test was used to compare results between the intervention and control groups. A significance level of $p < 0.05$ was used.

Ethical Consideration

Ethical approval for this study was obtained from the Research Ethics Committee (KEPK) of STIKep PPNI Jawa Barat, under approval number No. III/025/KEPK/STIKEP/PPNI/JABAR/V/2023. All participants provided informed consent prior to participation, and confidentiality was maintained throughout the research process.

RESULTS

This section presents the findings from the Below will be described the results of research regarding the influence of the Jigsaw learning method with Word Square evaluation media on understanding patient safety among nursing students.

Table 1. Description of the level of understanding of nursing students before and after being given intervention in the intervention group

Category Knowledge and Understanding	Pre-Test		Post-Test	
	N	%	N	%
Middle	12	60,0%	0	0,0%
High	8	40,0%	20	100,0%
Total	20	100%	20	100%

Table 1 above shows that the description of the level of understanding in the intervention group before being given the intervention was 12 respondents (60.0%), which means that more than half were in the moderate understanding category. Meanwhile, after being given the intervention, 20 respondents (100.0%) were all in the high-understanding category, so it can be concluded that there was a significant change in scores after being given the intervention in the intervention group.

Table 2. Description of the level of understanding of nursing students before and after being given intervention in the control group

Category Knowledge and Understanding	Pre-Test		Post-Test	
	N	%	N	%
Middle	16	80,0%	16	80,0%
High	4	20,0%	4	20,0%
Total	20	100%	20	100%

Table 2 above shows that the picture of understanding in the control group before being given the intervention was 16 respondents (80.0%), which means that most were in the moderate understanding category, and after being given the intervention, 16 (80.0%) were mostly in the category. With moderate understanding, it can be concluded that there was no significant change in scores before and after the intervention was given to the control group.

Table 3. Results of the Wilcoxon Signed Ranks Test for the Intervention Group Before and After Being Given the Intervention

		N	Mean Rank	Sum of Rank	Asymp. Sig. (2-tailed)
Post-Test Intervention Pre-Test Intervention	Negative Ranks	0	.00	.00	.000
	Positive Ranks	18	9.50	171.00	
	Ties	2			
	Total	20			

In table 3, the results of the Wilcoxon Signed Rank Test show the understanding value in the intervention group with a p-value of 0.000 < 0.05, which means there is a significant change in the level of understanding in the intervention group.

Descriptive Statistics

N		Mean	Std. deviation	Minimum	Maximum
Pre-test Intervention	20	69.20	7.578	56	80
Post-test Intervention	20	84.00	5.947	76	96

Based on the results of the descriptive analysis for the intervention group, it was found that the mean pre-test score was 69.20 with a standard deviation of 7.578. This indicates that before the intervention, there was a considerable variation in participants' scores, with some participants scoring significantly above or below the average. The minimum pre-test score was 56 and the maximum was 80, showing a wide range of scores among the participants.

After the intervention, the mean post-test score increased to 84.00, with a decreased standard deviation of 5.947. The reduction in standard deviation suggests that after the intervention, participants' scores became more uniform and were not widely dispersed from the mean. The minimum post-test score increased to 76 and the maximum score rose to 96, indicating that no participants achieved low scores as in the pre-test and that the highest scores also improved. Thus, these results show that the intervention using the jigsaw learning method with word square evaluation media had a positive effect on improving understanding in the intervention group.

Table 4. Results of the Wilcoxon Signed Ranks Test for the Control Group Before and After Being Given the Intervention

		N	Mean Rank	Sum of Rank	Asymp. Sig. (2-tailed)
Post-Test Intervention Pre-Test Intervention	**Negative Ranks**	0	.00	.00	.083
	Positive Ranks	3	2.00	6.00	
	Ties	17			
	Total	20			

In table 4, the results of the Wilcoxon Signed Rank Test show the understanding value in the control group with a p-value of 0.083 > 0.05, which means there is no significant change in the level of understanding in the control group.

Descriptive Statistics

N		Mean	Std. deviation	Minimum	Maximum
Pre-test Intervention	20	68.00	6.358	56	76
Post-test Intervention	20	68.60	6.261	56	76

Based on the results of the descriptive analysis for the control group, it was found that the mean pre-test score was 68.00 with a standard deviation of 6.358. This shows that before any intervention, participants scores were relatively close to each other, although there was still some variation. The minimum score recorded in the pre-test was 56, while the maximum score was 76, indicating a moderate range between the lowest and highest scores.

In the post-test, the mean score slightly increased to 68.60 with a slightly lower standard deviation of 6.261. This suggests that after the observation period, participant scores remained relatively consistent with little variation. The minimum and maximum scores remained the same as in the pre-test, at 56 and 76, respectively. Overall, these results indicate that there was no significant improvement in understanding within the control group during the study period, as reflected by the very small increase in the average score and the unchanged score range.

Table 5. Results of Differential Tests between Intervention Group and Control Group

	Asymp. Sig. (2-tailed)	Z
Intervensi-Kontrol	0,000	-5,244

Based on Table 5, the Z value is -5.244 (α > -1.96). The Z value states that the jigsaw learning method intervention with word square evaluation media can increase understanding of patient safety in nursing students. The results of statistical tests in the intervention and control groups showed p-value = 0.000 (α <0.05), so Ha was accepted, which means there was a significant change in value after providing the jigsaw learning method intervention with word square evaluation media on understanding patient safety in nursing students.

DISCUSSION

Description of the level of understanding of nursing students before and after being given the jigsaw learning method using word square evaluation media in the intervention group.

The intervention group demonstrated a significant improvement in understanding patient safety following the implementation of the Jigsaw learning method combined with the Word Square evaluation media. Pre-test data showed that the majority of participants (60%) were in the medium understanding category, while post-test results revealed that all participants (100%) advanced to the high understanding category. This change was supported by the Wilcoxon test results (p = 0.000), indicating a statistically significant improvement.

This finding is consistent with previous research (13,14) emphasizing the effectiveness of collaborative and active learning in enhancing student engagement and comprehension. The Jigsaw method encourages peer-to-peer learning, which has been proven to deepen understanding, while the Word Square evaluation promotes critical thinking and memory recall (15,16).

However these results should be interpreted within the context of the study's limitations. The small sample size and the fact that participants were drawn from a single institution limit the generalizability of the findings. Furthermore, the study did not include a long-term follow-up to assess retention of understanding.

Description of the level of understanding of nursing students before and after being given intervention in the control group

In contrast, the control group, which received conventional lecture-based learning using PowerPoint, showed minimal change. In both the pre-test and post-test data, 80% of the students remained in the medium understanding category, and the Wilcoxon test revealed no statistically significant difference (p = 0.083).

These findings reflect broader concerns regarding passive, teacher-centered learning approaches, which often fail to effectively engage students (17). Although a small number of students showed improvement, this was likely due to individual factors such as personal motivation and attentiveness rather than the effectiveness of the teaching method itself.

Differences in the level of understanding of nursing students before and after being given intervention in the intervention group and control group.

The Mann-Whitney test indicated a statistically significant difference between the intervention and control groups (p = 0.000; Z = -5.244), supporting the effectiveness of the Jigsaw method combined with the Word Square evaluation in enhancing students understanding of patient safety. These results align with other studies on cooperative learning strategies (14,18), which suggest that interactive methods not only improve cognitive engagement but also support long-term knowledge retention.

Theoretical and Practical Implications

Theoretically, the findings reinforce the principles of constructivist learning, wherein knowledge is developed through interaction and collaboration. Practically, implementing the Jigsaw method in combination with the Word Square media may serve as an effective strategy in nursing education, especially for improving understanding related to patient safety (19,20).

Limitations and Recommendations

The limitations of this study include its small, short-term evaluation, and the absence of qualitative insights into student experiences during the learning process. Future research should involve a more diverse sample and conduct long-term follow-up assessments.

CONCLUSION

This study found that the application of the Jigsaw learning method combined with Word Square evaluation media significantly improved nursing students' understanding of patient safety. The intervention group showed a complete shift from 60% in the medium category to 100% in the high understanding category, supported by statistically significant results (Wilcoxon test, *p* = 0.000). In contrast, the control group showed no significant change, with 80% of students remaining in the medium category (*p* = 0.083). These findings underscore the effectiveness of interactive and collaborative learning strategies in enhancing cognitive comprehension in nursing education. Integrate cooperative learning models such as the Jigsaw method and use interactive media like Word

Square to actively engage students, especially when teaching critical topics like patient safety. Support the implementation of innovative pedagogical approaches by providing training and resources for educators to design and evaluate active learning environments. Expand the scope of research to include psychomotor outcomes, attitudes, values, and perceptions related to patient safety.

Author Contribution

SNH : Conceptualization and Study Design, Methodology, Data Curation, Writing – Original Draft, Writing – Review & Editing
LAP and ES : Conceptualization and Study Design, Methodology, Formal Analysis, Writing – Review & Editing, Writing – Review & Editing
TAR and LJ : Data Curation, Writing – Review & Editing, Methodology, Formal Analysis

Conflict of Interest

The author states that there is no conflict of interest in this research

REFERENCES

1. Mohammed T, Woldearegay E, Kedir S, Ahmed K, Getnet M, Gudina EK. Patient safety knowledge, attitude and practice among undergraduate health science students in South West Ethiopia. Front Public Health. 2023;10:1064896.

2. Pratama AR, Nurmalia D. Gambaran Kompetensi Mahasiswa Keperawatan terhadap Pelaksanaan Sasaran Keselamatan Pasien di RSUD Ungaran. Diponegoro University; 2016.

3. Tambuwun S, Pasambo Y. Efektifitas Penggunaan Metode Belajar Student Center Learning di Jurusan Keperawatan Poltekkes Manado Effectiveness of Using Student Center Learning Methods in Nursing Department of Manado Health Polytechnic.

4. Iswati I. Pengetahuan Dan Penerapan Sasaran Keselamatan Pasien Pada Mahasiswa Semester 6 Di Akademi Keperawatan Adi Husada Surabaya. Adi Husada Nursing Journal. 2015;1(1):6–12.

5. Febriyana M, Winarti W. Efektivitas model pembelajaran berbasis student centered learning untuk meningkatkan hasil belajar mahasiswa pada mata kuliah microteaching. EduTech: Jurnal Ilmu Pendidikan dan Ilmu Sosial. 2021;7(2):378722.

6. Listyarini AD, Nyumirah S. Pengaruh Model Pembelajaran Kooperatif Tipe Jigsaw pada Mata Ajar Keperawatan Komunitas untuk Meningkatkan Hasil Belajar Mahasiswa. Jurnal Keperawatan dan Kesehatan Masyarakat Cendekia Utama. 2018;7(2):103–13.

7. Suryani L, Masmulyadi M, Perdani AL. The Relationship Between Knowledge, Motivation, and Supervision Towards Documentation Among Nurses at Private Hospital in Indonesia. Jurnal Keperawatan Komprehensif (Comprehensive Nursing Journal). 2024;10(3).

8. Zagoto MM. Peningkatan Hasil Belajar Mahasiswa Pada Mata Kuliah Dasar-Dasar Akuntansi 1 Melalui Implementasi Model Pembelajaran Kooperatif Word Square. Educativo: Jurnal Pendidikan. 2022;1(1):1–7.

9. Rauf S, Hidayah N, Khotimah NK, Amal AA. Persepsi Pasien terhadap Implementasi Keselamatan Pasien yang Dilindungi Perawat: Analisis. Jurnal Ilmiah Permas: Jurnal Ilmiah STIKES Kendal. 2023;13(1):185–92.

10. Wijaya H, Goenarso RA. Tingkat pengetahuan perawat tentang Patient Safety di rumah sakit Adi Husada Surabaya. Adi Husada Nursing Journal. 2016;2(1):68–74.

11. Notoatmodjo. S. Health Education and Behaviour. Rineka Cipta. 2018;

12. TIKA HUSWATUN HASANAH T. Gambaran Tingkat Pengetahuan Mengenai Patient Safety Pada Mahasiswa Tingkat Akhir Prodi Sarjana Keperawatan Di Fakultas Ilmu Kesehatan Universitas Kusuma Husada Surakarta. UNIVERSITAS KUSUMA HUSDA SURAKARTA; 2023.

13. Fitriani E, Mahsup M, Ibrahim I. Pengaruh Pembelajaran Kooperatif Tipe Jigsaw Untuk Meningkatkan Pemahaman. Justek: Jurnal Sains Dan Teknologi. 2018;1(2):1–8.

14. Gitelman L. Paper knowledge: Toward a media history of documents. Duke University Press; 2020.

15. Safkolam R, Ahmad Zaky El Islami R, Sari IJ. The Effects of Jigsaw Technique on Learning Achievement and Retention of Science Teacher Students. Shanlax International Journal of Education. 2023;11(2):37–42.

16. Halimah L, Sukmayadi V. The Role of" Jigsaw" Method in Enhancing Indonesian Prospective Teachers' Pedagogical Knowledge and Communication Skill. International Journal of Instruction. 2019;12(2):289–304.

17. Ardian A, Munadi S. Pengaruh strategi pembelajaran student-centered learning dan kemampuan spasial terhadap kreativitas mahasiswa. Jurnal Pendidikan Teknologi Dan Kejuruan. 2015;22(4):454–66.

18. Van Dat T. The Effects of Jigsaw Learning on Students' Knowledge Retention in Vietnamese Higher Education. International Journal of Higher Education. 2016;5(2):236–53.

19. Tran VD. The effects of cooperative learning on the academic achievement and knowledge retention. International journal of higher education. 2014;3(2):131–40.

20. Hayati SN, Supriatin E, Putri TARK, Ibrahim M, Sudrajat DA, Tambunan R. User Experience V-QITA: Nursing Education for Nursing Students. Jurnal Keperawatan Komprehensif (Comprehensive Nursing Journal). 2022;8(1).