

Effectiveness of the Jigsaw Method for Teaching “Hemorrhage” to Nursing Students: A Pilot Study

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Abstract- Active learning strategies are essential in nursing education to improve student engagement and knowledge retention. The jigsaw technique, originally developed by Aronson, organizes learners into groups where each becomes an ‘expert’ on a subtopic and then teaches peers. Research in nursing and allied health sciences reports mixed but generally positive outcomes of jigsaw, with evidence of improved achievement and teamwork skills. This study aimed to evaluate the effectiveness of a jigsaw session on hemorrhage for nursing students. **Method:** A quasi-experimental single-group pretest–posttest study was conducted in the Department of Child Health Nursing of selected College of Nursing, during July 2025. Twenty-two nursing students consented to participate. Students were divided into four groups of 4–5 members. The topic ‘hemorrhage’ was divided into four subtopics: classification, assessment, management, and documentation. Students studied in expert groups and taught peers in home groups. The investigator facilitated synthesis. An investigator-developed structured knowledge questionnaire was administered before and after the session. Data were analyzed using EZR software using paired-sample t-test; $p < 0.05$ was considered significant. **Results:** All 22 students completed the study. The mean pretest score was 6.77 (SD 1.34) and posttest 7.50 (SD 0.96). The mean difference of 0.73 was statistically significant ($p = 0.008$), indicating improved knowledge following the jigsaw session. **Discussion:** This study showed that a single jigsaw session improved immediate knowledge of hemorrhage among nursing students. Strengths of this study include its practical design and clinical relevance. Limitations include small sample size, lack of control group, and immediate posttest only.

I. INTRODUCTION

Active, student-centred instructional strategies are promoted in nursing education to improve engagement, critical thinking and teamwork—skills vital for clinical practice. The jigsaw classroom is a structured cooperative technique in which learners become “experts” on subtopics and then teach their

peers; it has been adapted across disciplines and health professions. Systematic reviews and recent meta-analyses in nursing and education report generally favorable effects of jigsaw on academic achievement, skills and attitudes, but also note variability by topic, implementation fidelity and outcome measured¹.

Hemorrhage (recognition and initial nursing management) is an acute, high-stakes clinical topic where accurate knowledge and team communication are essential. We therefore implemented a jigsaw session on “hemorrhage” and evaluated short-term changes in students’ knowledge with a pretest–posttest design.

II. METHODS

Design & setting. Quasi-experimental single-group pretest–posttest conducted in the Department of Child Health Nursing of selected College during July 2025
Participants and grouping. Twenty-two undergraduate nursing students consented and completed both assessments. Students were assigned to four home groups (4–5 members each) for the jigsaw activity.

Intervention (jigsaw procedure). The topic “hemorrhage” was divided into four subtopics—types/classification; assessment & recognition; immediate nursing management and interventions; documentation & prevention). Steps followed standard jigsaw procedure: (1) students reviewed assigned subtopic in home groups; (2) students met in expert groups to master and prepare short teaching presentations; (3) students returned to home groups and taught their subtopic to peers; (4) whole-class instructor synthesis and clarification

Outcome measure. Knowledge was measured using an investigator-developed structured questionnaire

administered immediately before and immediately after the session (pretest and posttest). Higher scores denote greater knowledge. Pretest and posttest scores were summarized as mean \pm SD. A paired-sample t-test compared the two means (two-tailed). Significance threshold $\alpha = 0.05$. Analyses were performed using EZR software.

III. RESULTS

Twenty-two students completed both pretest and posttest (divided into four groups, 4–5 students per group).

Knowledge scores.

Table 1. Pretest and posttest knowledge scores (n = 22)

Measure	Mean	SD	p-value
Pretest score	6.77	1.34	
Posttest score	7.50	0.96	0.008*

*Level of significance $p < 0.05$

IV. DISCUSSION

A single jigsaw session on hemorrhage produced a statistically significant immediate increase in knowledge in this sample of 22 nursing students. The present finding aligns with several nursing-education studies showing improved knowledge, skills or retention after jigsaw implementation. For example, a randomized/quasi-experimental study of jigsaw versus traditional teaching in first-year nursing students (arterial blood pressure topic) found significantly higher knowledge and psychomotor skill scores in the jigsaw group (intervention mean knowledge and skill advantage². Another recent quasi-experimental study reported improvements in psychomotor skill levels and retention with jigsaw³. Systematic reviews and a 2024 meta-analysis in nursing education conclude that jigsaw typically has a positive effect on academic achievement, skills and attitudes across multiple studies, although heterogeneity exists⁴.

Not all investigations show consistent learning advantages in every outcome. Leyva-Moral & Riu Camps reported that students were not highly satisfied with jigsaw in a research-methods course and that many students felt they did not learn more with jigsaw

than with traditional approaches raising questions about acceptability, workload perception and topic suitability⁵. Meta-analytic and review work has also highlighted that effects can vary by discipline, assessment timing (immediate vs retention), student age and implementation fidelity⁶.

The short-term knowledge gain seen here is consistent with mechanisms by which jigsaw may help (active retrieval, explaining to peers, distributed responsibility and increased engagement). The moderate effect size estimate supports practical relevance. However, the small convenience sample, single session, lack of a control group, and use of an investigator-developed (unvalidated) instrument limit causal inference and generalizability.

The study was feasible within routine class hours and included a clear description of the jigsaw procedure along with the use of investigator-developed learning materials. The small sample size, absence of randomization, reliance on an immediate posttest without assessing retention or clinical transfer, potential test-retest or Hawthorne effects, and limited psychometric evidence for the questionnaire restrict the study's generalizability and internal validity.

Jigsaw is a feasible active-learning strategy for acute clinical topics; educators should pilot it, ensure clear guidance and instructor facilitation, and combine it with validated outcome measures and retention testing. Future research should use randomized designs with larger samples and objective/clinical outcomes.

V. CONCLUSION

A single jigsaw teaching session on hemorrhage produced a statistically significant immediate improvement in knowledge among 22 nursing students (pretest 6.77 ± 1.34 ; posttest 7.50 ± 0.96 ; $p = 0.008$). The jigsaw method is promising for short-term knowledge gains in nursing education; further rigorous trials with validated measures and longer follow-up are recommended.

REFERENCES

- [1] Cochon Drouet O, Lentillon-Kaestner V, Margas N. Effects of the Jigsaw method on student educational outcomes: systematic review and meta-analyses. *Front Psychol.* 2023 Aug 3;14:1216437.
doi:10.3389/fpsyg.2023.1216437. PMC
- [2] Ziyai NY, Dikmen Y. The effect of the Jigsaw technique on the knowledge and skills of nursing students. *Bangladesh J Med Sci.* 2022 Oct;21(4):820–824.
doi:10.3329/bjms.v21i4.60257. banglajol.info
- [3] Aydin AG, Ince S. The effect of Jigsaw technique on nursing students' psychomotor skill levels and academic achievement: a quasi-experimental study. *Nurse Educ Pract.* 2023 Nov;73:103821.
doi:10.1016/j.nepr.2023.103821. PubMed
- [4] Ozkan S, Uslusoy EC. Outcomes of jigsaw technique in nurse education: a systematic review and meta-analysis. *Nurse Educ Pract.* 2024 Feb;75:103902.
doi:10.1016/j.nepr.2024.103902. PubMed
- [5] Leyva-Moral JM, Riu Camps M. Teaching research methods in nursing using Aronson's Jigsaw Technique: a cross-sectional survey of student satisfaction. *Nurse Educ Today.* 2016;40:78–83. PubMed
- [6] Sanaie N, Vasli P, Sedighi L, Sadeghi B. Comparing the effect of lecture and Jigsaw teaching strategies on the nursing students' self-regulated learning and academic motivation: a quasi-experimental study. *Nurse Educ Today.* 2019 Aug;79:35–40.
doi:10.1016/j.nedt.2019.05.022. PubMed