

A Comparative Study to Evaluate the Effectiveness of Simulation-Based Learning versus Traditional Teaching Methods on Knowledge Regarding Dog Bite First Aid Care among B.Sc. Nursing 1st Semester Students at Selected Colleges of Durg, Chhattisgarh

Ms. Noopur Das, Dr. Kalpana Bhushan Joshi

ABSTRACT

Dog bite injuries represent a major public health concern in India and are a leading cause of morbidity and preventable mortality due to rabies. Immediate and appropriate first aid is crucial in preventing infection and reducing complications. However, nursing students often lack sufficient practical exposure and confidence to manage dog bite emergencies effectively. Simulation-Based Learning (SBL) has emerged as an innovative and learner-centered teaching strategy to enhance clinical competence, while traditional teaching methods continue to dominate nursing education.

The present study aimed to evaluate and compare the effectiveness of simulation-based learning versus traditional teaching methods on knowledge regarding dog bite first aid care among B.Sc. Nursing 1st semester students at selected nursing colleges in Durg, Chhattisgarh. A quasi-experimental parallel group pre-test and post-test design was adopted. A total of 70 students were selected through simple random sampling and divided into two groups: Experimental Group-1 (SBL) and Experimental Group-2 (traditional teaching), with 35 students in each group.

Data were collected using a validated self-structured knowledge questionnaire consisting of 30 items. Pre-test knowledge assessment was conducted for both groups, followed by the respective teaching interventions. Post-test assessment was carried out immediately after the intervention. Data analysis involved descriptive and inferential statistics, including paired t-test, unpaired t-test, and chi-square test.

The results showed that the mean post-test knowledge score of the SBL group (Mean = 22.25, Mean% = 74.16%) was significantly higher than that of the traditional teaching group (Mean = 13.57, Mean% = 45.23%). Both groups demonstrated significant improvement in post-test scores; however, the gain was markedly higher in the SBL group. The unpaired t-test revealed a highly significant difference between the post-test knowledge scores of the two groups ($p < 0.05$). No significant association was found between pre-test knowledge scores and selected demographic variables.

The study concluded that simulation-based learning is more effective than traditional teaching methods in improving knowledge regarding dog bite first aid care among first-semester nursing students. Integration of simulation-based learning into the nursing curriculum is recommended to enhance clinical preparedness and emergency response skills.

Keywords: Comparative Study, Effectiveness, Simulation-Based Learning, Traditional Teaching Methods, Knowledge, Dog Bite First Aid Care, B.Sc. Nursing Students.

BACKGROUND:

Simulation based learning it's provides students with a safe, controlled, and realistic environment to practice clinical skills without risk to real patients. And to improve confidence and critical thinking among students or students in hand on practice rather than passive observation. (**Frontiers in public health 2022**) Traditional teaching method – It helps students learn theoretical knowledge through lectures, demonstrations, and classroom discussion. This method provides a strong base for understanding the subject before performing it in practice. Students can listen to the teacher, take notes, and ask questions to clear their doubt. (**International conference on humanity and social sciences 2022**) First aid care is an essential and life-saving skill that every nursing student must learn. It helps in providing immediate help to people who are injured or in emergency situations before professional medical treatment is available. Learning first aid care prepares nursing students to act quickly and correctly in such situations. (<https://doi.org/10.3390/healthcare13101112>)

First semester students are at the foundation stage of their nursing education, learning basic theoretical and practical concepts. Their syllabus often includes fundamental topics, such as first aid care, making the study relevant. [3] Dogs bite is about 10 million people about every year. Children are more likely to be injured by a dog bite than adults. Common victims are children between ages 5 and 9 years. Vaccinating stray dog is quite challenging. One out of every five victims require medical attention. [4] (Morbidity and mortality weekly report) Rabies is one of the oldest zoonotic disease affecting humans in India. rabies is deadly viral disease. A survey by the (ICMR) estimates that India sees 3.7million animal bites every year, and about 5,700 human rabies deaths annually. [5] Dog Bite Incidents: In 2023, Chhattisgarh recorded 119,928 dog bite cases, with three reported deaths. The highest number of cases were reported in Raipur, Bilaspur, and Durg districts Raipur district in Chhattisgarh has recorded 51,730 dog bite cases in the last three years.

AIM: To evaluate and compare the effectiveness of simulation-based learning Vs. traditional teaching methods in improving knowledge of BSc nursing 1 st semester students regarding dog bites first aid care.

REVIEW OF LITERATURE:

Carri Westgarth, et al., (2024), was conducted a cross-sectional study investigated true dog bite prevalence and incidence at a community-level and victim-related risk factors, in order to inform policy and prevention of a community of 1280 households in Cheshire, UK. Incidence of dog bites was 18.7 (11.0 –31.8) per 1000 population per year. Males were 1.81 times more likely to have been bitten in their lifetime than females (95% CI 1.20 to 2.72, P=0.005). This study suggests that the real burden of dog bites is considerably larger than those estimated from hospital records.

Poonam Vijay Sancheti (2022), was conducted an interventional study was carried out in an English medium secondary school. Total 140 students of age 13-15 years were studied. Baseline knowledge regarding rabies was determined by questionnaire method. A health education intervention regarding rabies was given to them. There was significant difference between knowledge regarding mode of

transmission of rabies, animals that transmit rabies in India and immediate steps after animal bite in students before health education intervention. There was inadequate knowledge regarding rabies, in students which shown significant increase after health education.

Peng M, 2022 Evaluation of teaching effect of first-aid comprehensive simulation-based education in clinical medical students” Research approach: Quantitative Research design: Quasi-experimental / Pre-test–Post-test comparative design Setting: Medical education institution Sample: Clinical medical students Sampling technique: purposive sampling Data collection tool: Structured knowledge questionnaire. Simulation-Based First Aid Education, including: •Hands-on practice of first-aid procedures Real-life emergency case simulations Faculty-guided debriefing session.

OBJECTIVES

1. To evaluate the effectiveness of simulation-based learning on knowledge regarding dog bite first aid care among B.Sc. Nursing 1st semester students.
2. To evaluate the effectiveness of traditional teaching methods on knowledge regarding dog bite first aid care among B.Sc. Nursing 1st semester students.
3. To compare the effectiveness of simulation-based learning versus traditional teaching methods on knowledge regarding dog bite first aid care.

METHODOLOGY

Research Design and Participants: This was a quasi-experimental two arm parallel group pre-test and post-test design was used. The study was conducted in selected private nursing colleges of Durg district, Chhattisgarh. Sample size was total of 70 B.Sc. Nursing 1st semester students were selected using simple random sampling and divided equally into- **Experimental Group-1: Simulation-Based Learning (n = 35)** **Experimental Group-2: Traditional Teaching Method (n = 35)**. Participants were selected based on predefined inclusion and exclusion criteria.

Inclusion and exclusion criteria:

Participants were eligible if they were willing to participate, studying in B. Sc. Nursing First semester at selected private nursing colleges and those participants were not received any first aid training related dog bites.

Study Procedure:

A self-structured pre-test knowledge questionnaire comprised into two section in first section demographic characteristics 10 items and 30 multiple-choice questions related to dog bite first aid care were administered to assess the knowledge related dog bites first aid care. The tool was validated by experts and tested for reliability.

Independent variable

- simulation-based learning
- traditional teaching method (lecture method)

Dependent variable

- knowledge regarding dog bite first aid care.

Phase I: Pilot study was conducted from **02/07/2025 to 08/07/2025** tool was administered to 10 B.Sc. Nursing 1st semester students who fulfilled the sampling criteria. The reliability of the tool was calculated by using Karl Pearson’s correlation co-efficient formula, the computed co-efficient value **r=0.80**.

Intervention details:

INTERVENTION	PROCESS
SIMULATION BASED LEARNING	STUDENTS UNDERGO HAND ON, SCENARIO BASED TRAINING THAT SIMULATES REAL DOG BITES FIRST AID CARE SIMULATION USING ROLE PLAYS AND GUIDED DEMONSTRATION (45 - MINUTES)
TRADITIONAL TEACHING METHOD	LECTURE CLASS & DEMONSTRATION FOR DOG BITE FIRST AID CARE

Phase II: data collection period was from **23/07/2025 to 08/08/2025**. Permission was obtained from IEC, and respected institutes. Formal individual consent taken before procedure. Participants were randomly assigned into two groups: one group received simulation-based learning, and the other group received traditional teaching methods. Before the educational intervention, pre-test conducted, simulation-based learning group participated in interactive, practical sessions involving simulated scenarios and demonstrations related to dog bite first aid. Meanwhile, the traditional teaching group attended lectures and received verbal instruction using textbooks and handouts, and after 7 days post-test conducted with the same tool used.

Data Collection Procedure

DAY	INTERVENTION		RATIONAL
	SIMULATION BASED LEARNING(GROUP A)		TRADITIONAL TEACHING METHOD(GROUP B)
DAY 1	- WRITTEN CONSENT LETTER (MJ COLLEGE) - COMMUNICATION ABOUT STUDY AND MAINTAIN IPR AND CLEAR THEIR DOUBT	DAY -1	- WRITTEN CONSENT LETTER (RASTOGI COLLEGE) - COMMUNICATION ABOUT STUDY AND MAINTAIN IPR AND CLEAR THEIR DOUBT
DAY 2	- (PRE TEST)CONDUCTING A STRUCTURED MULTIPLE CHOICE QUESTIONNERS(15- MINUTES) - AFTER PRE TEST CONDUCT 30 MINUTES LECTURE CLASS FOR DOG BITE FIRST AID CARE	DAY 2	- (PRE TEST)CONDUCTING A STRUCTURED MULTIPLE CHOICE QUESTIONNERS(15- MINUTES) - AFTER PRE TEST CONDUCT 30 MINUTES LECTURE CLASS & DEMONSTRATION FOR DOG BITE FIRST AID CARE
DAY 3	- (SBL) STUDENTS UNDERGO HAND ON, SCENARIO BASED TRAINING THAT SIMULATES REAL DOG BITES FIRST AID CARE SIMULATION USING MANNEQUINE,ROLE PLAYS AND GUIDED DEMONSTRATION (45 - MINUTES)	DAY -7	- POST TEST ASSESSMENT CONDUCTED USING THE SAME STRUCTURED QUESTIONNERS AFTER THE INTERVENTION
DAY 7	- POST TEST ASSESSMENT CONDUCTED USING THE SAME STRUCTURED QUESTIONNERS AFTER THE INTERVENTION		
			PERMISSION TAKEN (PRE TEST DONE) STRUCTURED BASED KNOWDEGE MULTIPLE CHOICE QUESTIIONNERS AND CLASS TEACHING HAND ON, SCENARIO BASED TRAINING THAT SIMULATES REAL DOG BITES FIRST AID CARE SIMULATION USING.ROLE (45 - MINUTES AFTER 7 DAYS POST TEST DONE

Outcome Measures and Data Analysis

Outcome was knowledge score improvement while practice will take overtime. Data analyzed using IBM SPSS version 25.0. Descriptive statistics summarized the finding while Chi-Square test and paired t-test assessed intergroup and intra group and intergroup differences assessed. were analyzed using descriptive statistics (frequency, percentage, mean, standard deviation) and inferential statistics (paired t-test, unpaired t-test, chi-square test).

RESULTS

The present study evaluated the comparative effectiveness of two educational intervention Simulation based learning and traditional teaching method on improving knowledge related dog bites first aid care among B.Sc. Nursing first semester students. The finding revealed that both methods significantly enhanced knowledge related dog bites first aid care however simulation-based learning method superior improvement in knowledge retention related dog bites first aid care. These results align with previous studies that have emphasized the importance of interactive learning strategies in skill-based learning, particularly for fresher B.Sc. Nursing students.

Table:1 Pre-test and post-test level of knowledge score in experimental group 1 and experimental group 2.

Level of knowledge	Experimental Group 1 Simulation based learning									
	Pre-Test					Post-Test				
	f	%	Mean	Mean%	SD	f	%	Mean	Mean%	SD
Poor	19	54.28	8.26	27.53%	1.249	0	0	0	0	0
Good	12	34.28	12.91	43.03%	1.114	8	22.85	18.12	60.40%	1.536
Excellent	4	11.42	22	73.33%	0.707	27	77.14	23.48	78.26%	1.197
Level of knowledge	Experimental group 2 Traditional teaching method									
	Pre-Test					Post-Test				
	f	%	Mean	Mean%	SD	f	%	Mean	Mean%	SD
Poor	20	57.14	9.3	31%	0.714	0	0	0	0	0
Good	10	28.57	12.9	43%	1.220	19	54.28	13.57	45.23%	1.388
Excellent	5	14.28	21.4	71.33%	0.800	16	45.71	22.06	73.53%	0.826

Table 2: Effectiveness of simulation-based learning v/s traditional teaching methods in experimental 1 group and experimental group 2

Knowledge Score	Mean	Mean%	S.D.	paired t-test	df	P-value	Table value	Inference
SBL Pre test	11.42	38.06	4.505	14.631	34	0.05	1.691	Not Significant
SBL Post Test	22.25	74.16	2.589					
TTM Pre test	12.05	40.16	4.222	5.173	34	0.05	1.691	Significant
TTM Post Test	17.45	58.16	4.384					

This finding confirms that simulation-based learning was significantly more effective than traditional teaching methods in enhancing the knowledge of B.Sc. Nursing 1st Semester students regarding dog bite first aid care.

CONCLUSION

The study concludes that simulation-based learning significantly improves knowledge regarding dog bite first aid care among B.Sc. Nursing 1st semester students when compared to traditional teaching methods. Incorporating simulation-based learning into the nursing curriculum can strengthen clinical competence, improve emergency preparedness, and enhance patient safety.

LIMITATIONS

1. The study was limited to selected nursing colleges of Durg, Chhattisgarh, which may limit generalization of findings.
2. The sample size was relatively small.
3. Post-test was conducted immediately after the intervention; long-term retention of knowledge was not assessed.
4. The study focused only on knowledge and did not assess practical skills or performance.

RECOMMENDATIONS

1. Simulation-based learning should be implemented for teaching various clinical and emergency care topics in nursing education.
2. The findings of the study can be generalized to nursing colleges and recommended for adoption of simulation-based teaching-learning methods in classroom and clinical training.

ETHICAL CLEARANCE: the ethical clearance was taken from the Government college of Nursing, Durg, Chhattisgarh.

FINANCIAL SUPPORT AND SPONSORSHIP: Nil.

CONFLICT OF INTEREST: There are no conflict of interest.

Reference

1. Peng M, Su N, Hou R, Geng H et al. (2022). *Front. Public Health* 10:909889. doi: 10.3389/fpubh.2022.909889.
2. Wang Y. A Comparative Study on the Effectiveness of Traditional and Modern Teaching Methods. In: *Proceedings of the 2022 5th International Conference on Humanities Education and Social Sciences (ICHESS 2022)* [Internet]; 2022 Oct 14-16; Chongqing, China. Dordrecht: Atlantis Press; 2022 [cited 2024 Mar 26]. p. 287-293. Available from: www.atlantis-press.com
3. Black, B. P. (2014). *Professional Nursing: Concepts & Challenges* (7th ed.). Elsevier.
4. Gulanick, M., & Myers, J. L. (2014). *Nursing Care Plans: Diagnoses, Interventions, and Outcomes* (8th ed.). Elsevier.
5. Ignatavicius, D. D., & Workman, M. L. (2016). *Medical-Surgical Nursing: Patient-Centered Collaborative Care* (8th ed.). Elsevier.
6. Mishra A, Sharma S, Gupta R. Machine learning-based strategies for enhancing dental care: a systematic review. *Healthcare*. 2025;13(10):1112. doi:10.3390/healthcare13101112.
7. Parada-Espinosa JM, Ortega-Gómez S, Ruiz-Muñoz M, González-Silva J. Teaching Methodologies for First Aid in Physical Education in Secondary Schools: A Systematic Review. *Healthcare*. 2025;13(10):1112. Available from: <https://doi.org/10.3390/healthcare13101112>.
8. Sancheti PV, Mangulikar SK. An interventional study to assess knowledge regarding rabies in secondary school students. *Int J Community Med Public Health*. 2016;3(1):180-183.
9. **Choi, E. J., et al.** (2024). Development and Effect of an Interactive Simulated Education Program as a Psychological First Aid Program for Nurses. *Journal of Nursing Education and Practice*, 14(5), 1-9.
10. **Kim, H., et al.** (2022). A Simulation-Based Nursing Education of Psychological First Aid for Nurses Caring for Adolescents Exposed to Hazardous Chemical Disasters. *BMC Medical Education*, 22(1), 1-9.
11. **Avau, B., et al.** (2022). Impact of the Use of Simulated Patients in Basic First Aid Training. *Journal of Clinical Nursing*, 31(1-2), 1-9.
12. **Septelici, D., et al.** (2024). Management Strategies for Common Animal Bites in Pediatrics. *Journal of Pediatric Nursing*, 59, 1-8.
13. **Tiwari, H. K., et al.** (2018). Knowledge, Attitudes and Practices Towards Dog-Bite Management Among Healthcare Workers in India. *Journal of Infection and Public*

Copyright & License:

© Authors retain the copyright of this article. This work is published under the Creative Commons Attribution 4.0 International License (CC BY 4.0), permitting unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.