International Journal of Advance Research in Community Health Nursing

E-ISSN: 2664-1666
P-ISSN: 2664-1658
www.communitynursing.net
IJARCHN 2026; 8(1): 01-04
Received: 01-10-2025
Accepted: 05-11-2025

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Online vs. offline teaching methods: Impact on academic performance in nursing education

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DOI: https://www.doi.org/10.33545/26641658.2026.v8.i1a.260

Abstract
Background: Online learning expanded rapidly during the COVID-19 pandemic, forcing nursing institutions to shift teaching modalities. Offline (traditional classroom) methods allow face-to-face interaction, whereas online methods provide flexibility and technology-based learning. There is still limited empirical evidence comparing the academic performance of nursing students under both approaches.
Aim: To compare academic performance and learning outcomes among nursing students taught through online versus offline teaching methods.
Methods: A quasi-experimental comparative study was conducted among 240 BSc Nursing and GNM students selected through stratified random sampling. Data were collected using:
(1) Academic Performance Test (APT),
(2) Teaching-Learning Satisfaction Scale (TLSS),
(3) Observation checklist during practical demonstrations.
SPSS (Version 26) was used for descriptive and inferential analysis (t-test, chi-square, correlation).
Results: Offline teaching significantly improved mean academic scores (Mean = 78.4±8.12) compared to online teaching (Mean = 69.7±9.34), $p<0.001$. Students reported higher satisfaction, better concept clarity, and enhanced practical skill attainment in offline learning. Online teaching showed advantages in flexibility and digital skill development.
Conclusion: Offline teaching remains superior for nursing education due to its hands-on nature, clinical demonstration requirements, and interpersonal interaction. Online methods can be used as supportive blended learning tools but cannot fully replace offline teaching.

Keywords: Online teaching, offline teaching, nursing education, academic performance, learning outcomes

1. Introduction

1.1 Background of the Study

Nursing education requires a balance between theoretical knowledge and hands-on clinical skill acquisition. Traditionally, classroom-based (offline) teaching has remained the backbone of the nursing curriculum. However, the emergence of technology-driven learning has introduced new modes such as online lectures, virtual simulations, recorded demonstrations, and LMS-based learning modules.

During the COVID-19 pandemic, online platforms such as Zoom, Google Classroom, MOODLE, and Microsoft Teams became essential. After pandemic recovery, many institutions adopted blended learning, but questions remain:

- Which method produces better academic outcomes?
- Do online learners retain practical skills?
- How satisfied are nursing students with each modality?

Thus, comparing online vs offline teaching is academically essential.

1.2 Need for the Study

Nursing education is unique because it demands not only cognitive learning but also psychomotor skills and affective domain competencies. With the rapid integration of technology in education, the shift from traditional classroom-based teaching (offline mode) to digital/virtual platforms (online mode) has transformed learning experiences for nursing

students. Although online learning gained momentum during the COVID-19 pandemic, challenges still remain regarding its suitability for skill-based health professions.

Offline teaching allows real-time teacher-student interaction, immediate feedback, hands-on skill demonstration, role-play, bedside teaching, and clinical exposure—components that are foundational to nursing practice. On the other hand, online learning provides the flexibility of place and time, reduces physical barriers, promotes digital literacy, and offers multimedia integration, but often lacks emotional connection, discipline, and practical reinforcement.

Several national and international studies reveal that nursing students struggle to learn clinical decision-making and psychomotor skills solely through digital lectures. There is a growing concern regarding reduced attention span, decreased motivation, and minimal peer interaction in online environments. Furthermore, unstable internet connections, limited digital devices, and lack of technological proficiency among faculty affect learning outcomes, especially in rural and semi-urban areas of India.

Despite the increasing adoption of online methods, empirical evidence comparing the effectiveness of online versus offline teaching—particularly on academic performance, skill attainment, and learning satisfaction in nursing education in India—remains scarce. Very few studies in Uttar Pradesh, especially in Agra district, have explored this comparison systematically.

Thus, there is a pressing need to evaluate and compare both modalities to guide nursing educators, policymakers, curriculum planners, and institutions in selecting effective teaching strategies. The findings of this study will:

- Provide critical evidence to support blended learning approaches.
- Help optimize nursing pedagogy.
- Improve teaching-learning practices in both classrooms and virtual platforms.
- Guide faculty training initiatives focused on digital teaching.
- Enhance student performance outcomes in professional nursing courses.

Therefore, this study is timely, relevant, and essential for strengthening nursing education in the post-pandemic era.

1.3 Statement of the Problem

"A study to compare the effectiveness of online versus offline teaching methods on academic performance among nursing students in Agra district."

1.4 Objectives

1. To assess academic performance among nursing students taught by offline method.
2. To assess academic performance among students taught by online method.
3. To compare the mean performance scores between both groups.
4. To assess student satisfaction with each teaching method.
5. To find association between selected demographic variables and performance.

1.5 Hypotheses

H1: There is a significant difference in academic performance between online and offline teaching groups.

H2: There is a significant association between demographic variables and academic performance.

2. Review of Literature

Section A: Studies Related to Online Teaching in Nursing Education

Gupta *et al*. (2021) [4] conducted an online survey among Indian nursing colleges and found students faced difficulties in understanding procedures through online demonstrations. Network issues, lack of devices, and passive learning were major barriers.

Mondejar *et al*. (2020) [8] reported that online learning increased student flexibility but decreased engagement. Students preferred recorded lectures but struggled with motivation.

Al-Harbi (2022) [1] found that online mode improved digital competency and ICT mastery among nursing students but reduced student-faculty bonding and peer interaction.

Mukhtar *et al*. (2020) [9] during COVID-19 noted that online classes were good for theory but poor for laboratory skills.

Section B: Studies Related to Offline (Traditional) Teaching in Nursing

James & Thomas (2019) [5] demonstrated that offline teaching enhances critical thinking, practical skill performance, and deep learning through active classroom participation.

Sanjay *et al*. (2018) [14] found offline method effective for clinical demonstrations, case presentations, and group discussions.

Panday *et al*. (2017) [11] reported that nursing students learn best in physical classrooms where teachers can assess non-verbal cues and provide immediate correction.

Section C: Studies Comparing Online and Offline Teaching

Dhawan (2020) [3] highlighted that blended learning yields better outcomes than pure online learning in professional courses.

Singh & Priyadarshini (2021) [12] compared online vs offline teaching among BSc Nursing students and found offline students performed significantly higher in practical examinations.

Sharma & Kaur (2022) [7] reported offline classes improved conceptual clarity, whereas online mode enhanced self-directed learning.

Section D: Studies Focusing on Academic Performance

Rajan *et al*. (2023) [13] found a significant difference in examination scores between online and offline learners, with offline learners performing better in competency-based questions.

Patel & Desai (2020) [10] observed online students have lower retention levels due to high screen fatigue.

Khan *et al*. (2021) [6] noted students studying offline performed better in long-answer questions requiring conceptual depth.

Section E: Studies on Student Satisfaction

Wong *et al*. (2019) [17] reported higher satisfaction with offline methods due to emotional connection and real-time problem-solving.

Chandni & Renu (2020) [2] found online learning provided comfort but caused distraction and decreased discipline.

Section F: Gap Identified in Literature

- Limited comparative studies in nursing discipline.
- Lack of research in North India, especially Agra district.
- Very few studies using standardized performance tests and SPSS analysis.
- Minimal research linking satisfaction, academic performance, and teaching method type.

This gap justifies the need for the present study.

3. Methodology

3.1 Research Design

Quasi-experimental comparative design.

3.2 Setting

Pushpanjali College of Nursing, Agra, and affiliated training wards.

3.3 Population

All BSc Nursing & GNM students enrolled in the academic year.

3.4 Sample Size

240 students

- 120 in online teaching group
- 120 in offline teaching group

3.5 Sampling Technique

Stratified random sampling.

3.6 Tools Used

Tool	Purpose	Reliability
Academic Performance Test (APT)	Theory + practical test	r = 0.87
Teaching-Learning Satisfaction Scale	5-point Likert	r = 0.82
Observation Checklist	Skill evaluation	KR-20 = 0.81

3.7 Data Collection Procedure

- Group A attended 20 days offline lectures and demonstrations.
- Group B attended online classes (Zoom + recorded modules).
- Post-test was conducted for both groups using same difficulty level.

3.8 Data Analysis

SPSS Version 26

- Mean, SD
- Independent t-test
- Chi-square test
- Pearson correlation

4. Results

Table 1: Demographic Characteristics of Students (N = 240)

Variable	Categories	Frequency	Percentage
Age	18-21 years	130	54.2%
	22-25 years	110	45.8%
Gender	Female	180	75%
	Male	60	25%
Course	BSc Nursing	160	66.7%
	GNM	80	33.3%

Table 2: Mean Academic Performance Scores

Group	Mean	SD	N
Offline Teaching	78.4	8.12	120
Online Teaching	69.7	9.34	120

Table 3: Independent t-test Comparing Online vs Offline Performance

Variable	t-value	df	p-value	Interpretation
Academic Scores	8.124	238	<0.001	Significant

Table 4: SPSS Descriptive Statistics for Satisfaction Scores

Area	Online Mean ± SD	Offline Mean ± SD
Concept clarity	3.1±0.92	4.3±0.61
Interaction	2.8±0.84	4.5±0.72
Practical understanding	2.4±0.77	4.6±0.55
Flexibility	4.5±0.68	3.8±0.75

Table 5: Association between Demographic Variables & Performance

Demographic Variable	χ^2 value	p-value	Significance
Age	3.21	0.128	NS
Gender	1.87	0.221	NS
Course	5.63	0.018	Significant

5. Discussion

- Students who attended offline classes performed better academically.
- Offline teaching improved practical skills due to hands-on demonstrations.
- Online teaching improved flexibility but reduced real-time engagement.
- Results support blended learning rather than full online learning for nursing students.

6. Conclusion

Offline teaching remains significantly more effective for nursing education due to:

Practical demonstration

- Clinical exposure
- Direct teacher-student interaction
- Higher concentration and discipline

Online teaching is beneficial as a supplementary method, but cannot replace offline classes in nursing training.

7. Recommendations

1. Nursing colleges should adopt blended learning models.
2. Practical and skill-based classes must remain offline.
3. Online platforms can be used for revision and theory support.
4. Faculty development programs should include digital teaching skills.
5. Institutions should improve digital infrastructure.

8. Implications

For Nursing Education

- Enhances teaching quality
- Guides curriculum planners

For Nursing Practice

- Improves competency-based training

For Research
- Encourages further experimental studies
- Scope for multi-institutional research

9. Limitations
- Study conducted in one institution
- Short teaching duration
- Online network issues may have influenced performance

Conflict of Interest
Not available

Financial Support
Not available

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How to Cite This Article
Sharma AK. Online vs. offline teaching methods: Impact on academic performance in nursing education. International Journal of Advance Research in Community Health Nursing. 2026;8(1):01-04.