Innovative Approaches to Teaching Gynecology in Medical Universities: Integrating Simulation, Case-Based Learning, and Competency-Oriented Assessment

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Abstract

Background: Gynecology is a core discipline in undergraduate medical education, requiring the integration of theoretical knowledge, procedural skills, clinical reasoning, and professional communication. Traditional lecture-centered models often fail to adequately prepare students for real-world gynecological practice. **Objective:** This study evaluates the effectiveness of an integrated teaching model combining simulation-based learning (SBL), case-based learning (CBL), and objective structured clinical examination (OSCE)–driven assessment in undergraduate gynecology education. **Methods:** A quasi-experimental educational study was conducted among 164 fourth- and fifth-year medical students. Students were divided into a traditional teaching group and an integrated teaching group. Learning outcomes were assessed using written examinations, OSCE scores, and structured student feedback questionnaires. **Results:** Students exposed to the integrated model demonstrated significantly higher clinical competence, improved communication skills, and greater confidence in gynecological examinations compared with peers in the traditional curriculum. **Conclusion:** Integrating simulation, case-based learning, and competency-based assessment significantly enhances gynecology education and aligns undergraduate training with modern clinical and educational standards.

Keywords: gynecology education; simulation-based learning; case-based learning; OSCE; medical curriculum; clinical competence

Introduction

Gynecology represents a cornerstone of medical education, encompassing preventive care, reproductive health, obstetric-gynecological pathology, and women's health across the lifespan. Undergraduate medical students are expected not only to acquire theoretical knowledge but also to develop sensitive communication skills, clinical reasoning, and hands-on procedural competence. However, teaching gynecology presents unique pedagogical challenges due to ethical considerations, patient privacy, and limited opportunities for repetitive practice in real clinical settings.

Historically, gynecology teaching in medical universities has relied heavily on didactic lectures and opportunistic bedside teaching. While these approaches provide foundational knowledge, they often fail to ensure uniform exposure to key clinical scenarios, such as pelvic examination, contraception counseling, abnormal uterine bleeding, and gynecological emergencies. As a result, graduates may enter clinical practice with gaps in confidence and competence.

Contemporary medical education emphasizes student-centered learning, early clinical exposure, and competency-based assessment. Simulation-based learning (SBL) and case-based learning (CBL) have emerged as effective strategies to bridge the gap between theory and practice. Additionally, the Objective Structured Clinical Examination (OSCE) has become a gold standard for assessing clinical skills in a structured and reproducible manner.

This study explores an integrated educational model for teaching gynecology in medical universities and evaluates its impact on student learning outcomes compared with traditional teaching methods.

Methods

Study Design and Participants

A quasi-experimental study was conducted during one academic year in the gynecology and obstetrics departments of a medical university. A total of 164 undergraduate medical students in their 4th and 5th years participated voluntarily. Students were divided into two groups:

- **Traditional Teaching Group (TTG):** 82 students receiving lecture-based teaching and routine clinical rotations.
- **Integrated Teaching Group (ITG):** 82 students receiving a combined approach of lectures, simulation-based learning, case-based discussions, and structured OSCE preparation.

Educational Intervention

The integrated teaching model consisted of three core components:

1. **Simulation-Based Learning (SBL):** Students practiced pelvic examinations, speculum insertion, bimanual examination, and management of gynecological emergencies using high-fidelity and task-trainer simulators. Sessions were supervised by trained faculty and included immediate feedback.
2. **Case-Based Learning (CBL):** Small-group discussions were organized around common and high-impact gynecological cases, including abnormal uterine bleeding, ovarian cysts, pelvic inflammatory disease, infertility, and cervical cancer screening. Students analyzed clinical data, proposed diagnostic algorithms, and discussed management plans.

3. **Competency-Based Assessment:** Teaching objectives were aligned with OSCE stations focusing on history taking, communication, examination technique, interpretation of investigations, and clinical decision-making.

Assessment Tools

- **Written Examination:** Multiple-choice and short-answer questions assessing theoretical knowledge.
- **OSCE:** Eight standardized stations evaluating practical and communication skills.
- **Student Feedback Questionnaire:** A validated Likert-scale survey assessing satisfaction, perceived competence, and confidence.

Statistical Analysis

Data were analyzed using descriptive statistics and comparative tests. Mean scores between groups were compared using Student's *t*-test, with statistical significance set at $p < 0.05$.

Results

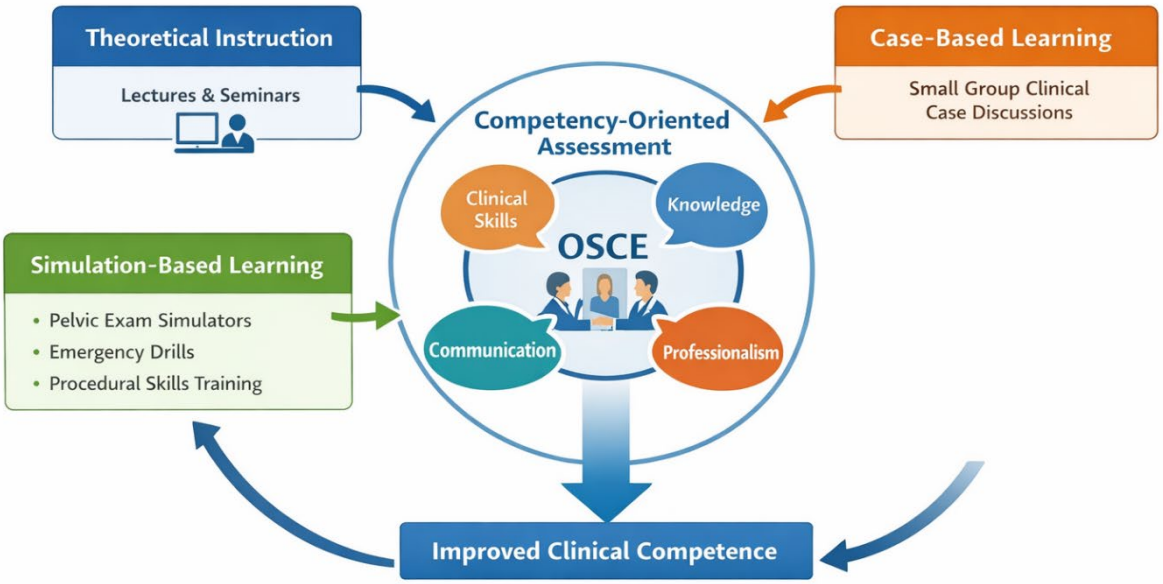
Knowledge Assessment

Both groups demonstrated comparable baseline knowledge. At the end of the course, the ITG achieved higher mean written examination scores (78.6 ± 6.4) compared with the TTG (72.1 ± 7.2), indicating improved theoretical integration.

OSCE Performance

OSCE results revealed a marked difference between groups. Students in the integrated teaching group outperformed their peers in all stations, particularly in pelvic examination technique, patient counseling, and clinical reasoning. The largest performance gap was observed in communication-focused stations, where ITG students demonstrated clearer explanations, greater empathy, and improved professionalism.

Figure 1. Integrated Teaching Model for Gynecology Education



Student Perceptions

Survey results showed higher satisfaction rates among ITG students. Over 85% reported increased confidence in performing gynecological examinations, compared with 54% in the traditional group. Students emphasized the value of simulation for reducing anxiety and the usefulness of case-based discussions for understanding real-world clinical complexity.

Overall Learning Outcomes

The integrated teaching approach produced more consistent competency attainment across students, reducing variability in clinical skills and ensuring exposure to essential gynecological scenarios.

Discussion

The findings of this study support the growing body of evidence favoring integrated, competency-based teaching models in medical education. Gynecology, as a discipline requiring both technical skill and sensitive communication, particularly benefits from simulation-based and case-based approaches.

Simulation provides a safe, ethical, and reproducible environment for students to practice intimate examinations without compromising patient comfort or safety. Repeated exposure and structured feedback allow learners to refine psychomotor skills and professional behavior. Case-based learning complements simulation by fostering

analytical thinking and encouraging the application of theoretical knowledge to clinical decision-making.

The superior OSCE performance of the integrated teaching group highlights the alignment between teaching methods and assessment strategies. When learning objectives, instructional design, and evaluation tools are harmonized, students demonstrate deeper learning and more reliable competence.

Despite its strengths, this study has limitations. It was conducted in a single institution and over one academic year, which may limit generalizability. Future multicenter studies and longitudinal follow-up are recommended to evaluate long-term retention of skills and impact on clinical practice.

Conclusion

Innovative teaching strategies are essential for preparing medical students to meet the clinical and ethical demands of modern gynecology. This study demonstrates that an integrated model combining simulation-based learning, case-based discussions, and competency-oriented assessment significantly improves knowledge acquisition, clinical skills, and student confidence.

Medical universities should consider embedding such integrated approaches into gynecology curricula to enhance educational quality, standardize clinical competence, and ultimately improve women's healthcare outcomes. The shift from passive learning to active, practice-oriented education represents a critical step toward aligning undergraduate medical training with contemporary healthcare needs.

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