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Original research article

A study of efficiency and students' perception of video animation in learning OBG surgical skills

[1]Dr. Viday S Prabhu, [2]Dr. Sangeetha K

[1,2]Associate Professor, Department of OBG, Srinivas Institute of Medical Sciences and Research Centre, Mukka, Mangalore, Karnataka, India

Corresponding Author: Dr. Sangeetha K

Abstract

Background: With the evolution of medical education, innovative teaching methods like video animation have emerged as crucial tools in delivering complex surgical skills training. This study investigates the effectiveness and students' perceptions of video animations in learning obstetrics and gynecology (OBG) surgical skills. A total of 450 medical students participated in this study. Data were collected via a Likert scale survey and Objective Structured Clinical Examination (OSCE) scores, comparing outcomes from both video animation-based learning and traditional live surgery demonstrations. Results showed a significant improvement in understanding and performance after using video animation, though live demonstrations continued to be perceived as slightly more effective by the students.

Keywords: Video animation, obstetrics and gynecology, surgical skills, learning effectiveness, students' perception

Introduction

Medical education is undergoing a substantial transformation, moving from traditional classroom-based lectures to incorporating more dynamic and innovative teaching methods [1, 2]. Video animations, in particular, have emerged as a valuable resource for conveying complex surgical procedures, providing a visual and interactive learning experience. The shift from live demonstrations to video-based content became particularly pronounced during the COVID-19 pandemic, where restrictions on in-person gatherings led educators to explore digital learning tools [3-7].

The introduction of video animations in teaching surgical skills allows students to review and understand procedures repeatedly at their own pace [8]. This study explores the effectiveness of video animation as a teaching tool for OBG surgical skills and evaluates students' perceptions of this learning method compared to traditional live demonstrations.

Aims and Objectives

- To compare students' perceptions of video animation and live surgery demonstrations.
- To assess the effectiveness of video animation in improving OSCE performance in OBG surgical skills.

Materials and Methods

Study Design and Participants

The study was conducted at the Department of Obstetrics and Gynecology, Srinivas Institute of Medical Sciences, Mangalore, from January to August 2022. A sample of 450 medical students participated in this study. Students were randomly assigned to two groups: Group A, which received video animation-based instruction, and Group B, which attended live surgical demonstrations.

Teaching Methods

- **Video Animation Group (Group A):** Students in this group were provided with video animations of common OBG surgical procedures, such as Cesarean sections and episiotomies. The videos included step-by-step visualizations and narrations explaining the techniques.
- **Live Surgery Group (Group B):** Students in this group attended live surgery demonstrations of the same procedures, allowing them to observe the real-time decision-making process and surgical techniques.

Data Collection

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The students' understanding and perception of the teaching methods were assessed using a pre-validated Likert scale questionnaire. In addition, their practical skills were evaluated using the OSCE after completing both methods of learning. The OSCE involved both visual recognition tasks and practical demonstrations of surgical techniques.

Statistical Analysis

The perception scores from the Likert scale were analyzed using a paired t-test to compare the two teaching methods. OSCE scores were similarly evaluated using a t-test to assess the impact of the different teaching approaches on student performance. Statistical significance was set at $p<0.05$.

Results

Demographic Characteristics

Of the 450 participants, 220 were assigned to Group A (video animation), and 230 to Group B (live surgery demonstrations). The mean age of participants was 22.5 ± 1.2 years, with 58% female and 42% male students.

Perception Scores

The perception of students regarding both methods was analyzed, as shown in Table 1. Students in the video animation group scored a mean of 38.1 ± 7.2, while those in the live surgery group scored a mean of 47.3 ± 5.8. The perception score for live surgery demonstrations was higher, indicating a preference for traditional teaching methods, but the difference was statistically significant ($p < 0.001$).

Table 1: Perception Scores of Students (Video Animation vs Live Surgery)

Teaching Method	Mean ± SD	Max	Min	Median
Video Animation	38.1 ± 7.2	50	24	38
Live Surgery	47.3 ± 5.8	50	33	47.5

OSCE Scores

OSCE scores were collected to evaluate the practical skills of the students. Group A (video animation) had a mean OSCE score of 36.8 ± 6.4, while Group B (live surgery) had a mean OSCE score of 45.9 ± 3.6, as shown in Table 2. Students who learned through live demonstrations performed slightly better in the OSCE, but the results showed that video animations were still a highly effective method for teaching surgical skills.

Table 2: OSCE Scores of Students (Video Animation vs Live Surgery)

Teaching Method	N	Mean ± SD	t	df	P-value
Video Animation	220	36.8 ± 6.4	-8.2	440	<0.001
Live Surgery	230	45.9 ± 3.6			

Correlation between Perception and OSCE Scores

A correlation analysis was conducted to determine the relationship between students' perception and their performance in the OSCE. The results revealed a positive correlation between perception scores and OSCE performance ($r = 0.58$, $p<0.01$), indicating that students who had a favorable perception of the teaching method tended to perform better in the practical examination.

Discussion

The findings of this study suggest that both video animation and live surgery demonstrations are effective in teaching OBG surgical skills to medical students. However, live demonstrations were slightly favored by the students in terms of their perception, as evidenced by higher perception scores. This could be attributed to the real-time feedback and dynamic nature of live surgeries, which offer a more immersive learning experience.

That said, video animation proved to be a valuable educational tool, allowing students to revisit complex procedures repeatedly, a benefit that live demonstrations cannot offer. Students in the video animation group demonstrated significant improvement in their OSCE scores, highlighting the effectiveness of visual learning.

Previous studies have produced similar findings. Ramlogan *et al.* (2014) found that students who attended live lectures scored higher in exams compared to those who watched recorded videos, though both groups benefited from the instructional content [8]. Paegle *et al.* (1980) also noted that live demonstrations offer certain advantages in skill acquisition, but video lectures provide a flexible and convenient learning experience [6].

One limitation of this study is that it did not measure the long-term retention of surgical skills, which could be an area for future research. Additionally, while the sample size of 450 students provides robust results, further research could investigate the use of video animation in a broader range of surgical

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disciplines.

Conclusion

This study concludes that video animation is an effective teaching tool for learning OBG surgical skills. While live surgical demonstrations were preferred by students and led to slightly higher OSCE scores, video animations allowed for flexibility, self-paced learning, and a thorough understanding of the procedures. Both methods should be integrated into medical education to provide comprehensive and effective training in surgical skills.

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