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Research Article

INTRODUCTION OF CASE-BASED LEARNING FOR TEACHING MEDICINE IN PHASE 2ND M.B.B.S. STUDENTS

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ABSTRACT

Objectives: The objective of this study was to assess and compare case-based learning (CBL) with traditional teaching among phase 2 MBBS students.

Methods: This study is designed as an educational interventional cross-over trial with a quantitative approach to compare two distinct clinical teaching methods at the government medical college, Pali. The primary aim is to assess the impact of CBL on the educational experiences of 2nd-year MBBS students.

Results: The analysis confirms that CBL significantly improves students' understanding and satisfaction compared to traditional teaching, offering a more effective and engaging learning experience.

Conclusion: The study recommends CBL for 2nd-year medical students, as it is preferred for its engaging and effective approach to understanding and applying medical concepts.

Keywords: Medical education, Teaching approaches, Teaching–learning methods, Case-based learning.

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INTRODUCTION

The field of medical education is dynamic and always changing to meet the needs of modern health-care delivery. The last year of medical school is the pinnacle of the educational experience, where theoretical knowledge meets practical clinical experiences [1-3]. One of the main components of medical education is clinical teaching, which provides a special setting for students to interact with patients and see how their knowledge is put to use. The mainstay of traditional clinical education is the taking of history and performing physical examinations; theoretical topics make up the majority of talks. As a teaching–learning health activity, ward rounds are complex duties requiring medical knowledge and clinical competence in addition to communication, clinical technical, patient management, and teamwork skills [4-6].

In medical education, the second phase of MBBS is a critical stage where students delve deeper into clinical knowledge and application. Introducing case-based learning (CBL) in phase 2nd M.B.B.S. aims to address the limitations of traditional teaching methods in preparing students for real-world medical practice [7].

CBL involves using real-life cases to promote active learning, critical thinking, and practical application of knowledge [8]. Implementing CBL in this phase can enhance the learning experience and better prepare students for the complexities of health care. The objective of this study was to assess and compare CBL with traditional teaching among phase 2 MBBS students.

METHODS

This study is designed as an educational interventional cross-over trial with a quantitative approach to compare two distinct clinical teaching methods at the government medical college, Pali. The primary aim is to assess the impact of CBL on the educational experiences of 2nd-year MBBS students. The study encompasses two teaching methods: The traditional teaching method and the case-based teaching method. The traditional teaching method involves students attending two sessions, each focusing on different sets of medicine topics. In contrast, the case-based teaching method involves two sessions that use interactive case studies to cover additional topics. The study targets the 2nd-year MBBS students from the 2021 batch, who are currently undergoing clinical rotational postings in the general medicine department. The study is set to span a total of 56 days, divided into two rounds of 28 days each.

Sample size

The sample size comprises 110 medical students, divided into two groups of 55 each. Group A starts with traditional teaching, while Group B begins with case-based teaching. After a 4-day washout period, the groups switch methods, with Group A transitioning to case-based teaching and Group B to traditional teaching. This crossover design allows for the evaluation of both teaching methods by each group. Consent was obtained from all participating students, who provided written informed consent ensuring their voluntary participation and the confidentiality of their responses. The study includes specific phases: in the initial phase, each group of 55 students underwent 28 days of clinical rotations with two distinct teaching methods over a period of 24 days, followed by a 4-day washout period. Subsequently, the methods were interchanged for the final 12 days of the rotation, concluding the first phase.

Data collection

Data collection involved feedback questionnaires using a 5-point Likert scale, administered after exposure to each teaching method. These questionnaires assessed students' perceptions and satisfaction with the teaching methods. Inclusions criteria encompassed 2nd-year MBBS students from the 2021 batch assigned to the medicine department from November 2023 to December 2023. Exclusion criteria included students who were frequently absent or did not provide consent.

Statistical analysis

The collected data were inputted into a Microsoft Excel sheet, and quantitative data were presented as mean and standard deviation (SD). Analysis was performed using Chi-square analysis to compare the students' perceptions toward both teaching methods.

RESULTS

Table 1 highlights a clear difference in student satisfaction between traditional teaching and CBL regarding the comprehension of complex medical topics. Traditional teaching saw 15 students strongly dissatisfied and only 7 strongly satisfied, with a notable portion expressing dissatisfaction. In contrast, CBL demonstrated a more favorable response, with only 3 students strongly dissatisfied and 31 strongly satisfied, reflecting a broader spectrum of positive feedback. This comparative analysis underscores that students generally find CBL more effective and satisfying for understanding intricate medical concepts, suggesting its potential advantage over traditional methods in enhancing educational outcomes (Table 1).

Table 2 illustrates a significant difference in how traditional teaching and CBL are perceived in bridging theoretical knowledge with practical scenarios. Traditional teaching saw considerable dissatisfaction, with 14 participants strongly dissatisfied and only 9 strongly satisfied. In contrast, CBL received more positive feedback, with no participants strongly dissatisfied and 34 strongly satisfied. Although 33 participants were dissatisfied with CBL, the overall response indicates that CBL is more effective in creating meaningful connections between theory and practice, enhancing participants' understanding compared to traditional methods (Table 2).

This analysis sheds light on participant perceptions, suggesting that CBL teaching methods are associated with a more positive impact on motivation for self-directed learning (SDL) compared to traditional teaching methods. The data provide valuable insights into the nuances of student experiences and preferences regarding the learning approach (Table 3).

This analysis underscores the diverse range of participant experiences and satisfaction levels with CBL teaching methods, offering valuable insights into the strengths and weaknesses of this approach compared to traditional teaching methods (Table 4).

Table 5 reveals a clear preference for CBL over traditional teaching in improving the learning experience. In the CBL group, most participants were either satisfied (38) or strongly satisfied (33), with only a few expressing dissatisfaction. In contrast, the traditional teaching group showed a significant level of dissatisfaction, with 23 participants strongly disagreeing about its effectiveness and only 8 strongly satisfied (Table 5).

The data comparing traditional teaching (H1) and CBL (H2) methods show that CBL is perceived as more effective, with a higher mean

Table 1: Effectiveness of CBL teaching methods

Parameter	Response of students who experience traditional teaching		Response of students who experience CBL teaching	
	No. of Participants	Percentage	No. of Participants	Percentage
Strongly dissatisfied	15	13.64	3	2.73
Dissatisfied	31	28.18	24	21.82
Neutral	23	20.91	6	5.45
Satisfied	34	30.91	46	41.82
Strongly satisfied	7	6.36	31	28.18
Total	110	100.00	110	100.00

CBL: Case-based learning

Table 2: Connection between theory and practical situations in CBL teaching methods

Parameter	Response of students who experience traditional teaching		Response of students who experience CBL teaching	
	No. of Participants	Percentage	No. of Participants	Percentage
Strongly dissatisfied	14	12.73	0	0.00
Dissatisfied	28	25.45	33	30.00
Neutral	24	21.82	3	2.73
Satisfied	25	22.73	40	36.36
Strongly satisfied	9	8.18	34	30.91
Total	110	100.00	110	100.00

CBL: Case-based learning

Table 3: Impact on motivation for self-directed learning

Parameter	Response of students who experience traditional teaching		Response of students who experience CBL teaching	
	No. of Participants	Percentage	No. of Participants	Percentage
Strongly dissatisfied	12	10.91	1	0.91
Dissatisfied	37	33.64	36	32.73
Neutral	40	36.36	1	0.91
Satisfied	15	13.64	25	22.73
Strongly satisfied	6	5.45	47	42.73
Total	110	100.00	110	100.00

CBL: Case-based learning

Table 4: Overall experience and satisfaction in CBL teaching methods

Parameter	Response of students who experience traditional teaching		Response of students who experience CBL teaching	
	No. of Participants	Percentage	No. of Participants	Percentage
Strongly dissatisfied	6	5.45	1	0.91
Dissatisfied	38	34.55	41	37.27
Neutral	44	40.00	1	0.91
Satisfied	21	19.09	36	32.73
Strongly satisfied	1	0.91	31	28.18
Total	110	100.00	110	100.00

CBL: Case-based learning

Table 5: Hypothesis testing

Parameter	H2: CBL teaching has effectively helped to improve our learning experience		H1: Traditional teaching methods have effectively helped in improving our learning experience	
	No. of Participants	Percentage	No. of Participants	Percentage
Strongly dissatisfied	5	4.55	23	20.91
Dissatisfied	9	8.18	30	27.27
Neutral	25	22.73	35	31.82
Satisfied	38	34.55	14	12.73
Strongly satisfied	33	30.00	8	7.27
Total	110	100.00	110	100.00

CBL: Case-based learning

rating (3.87) compared to traditional teaching (2.67). The variability in responses is slightly lower for CBL (SD: 1.01) than for traditional teaching (SD: 1.06), and the smaller standard error of the mean for CBL (0.12) indicates a more precise estimate of effectiveness. These results highlight that CBL generally provides a more consistent and effective learning experience compared to traditional teaching (Table 6).

Table 6: Review of data

Group	H1: Traditional teaching methods have effectively helped in improving our learning experience	H2: CBL teaching method have effectively helped in improving our learning experience.
Mean	2.67	3.87
SD	1.06	1.01
SEM	0.13	0.12
N	110	110

SD: Standard deviation

DISCUSSION

Analysis of questionnaire data reveals that CBL significantly enhances students' understanding of complex medical concepts compared to traditional teaching, integrating theory with practical application. CBL establishes effective connections between theoretical knowledge and practical scenarios, optimizing the complex medical curriculum and honing clinical abilities [9].

Furthermore, CBL contributes to the prolonged retention of acquired knowledge and valuable insights, offering a patient-centered approach that exposes students to diverse cases. It enhances clinical reasoning, practical skills, and creativity, fostering a collaborative learning environment. CBL stimulates greater motivation for SDL compared to traditional methods, overcoming limitations such as limited engagement opportunities and hierarchical structures [10].

Overall, student satisfaction is markedly higher with CBL teaching methods compared to traditional teaching, emphasizing the comprehensive and dynamic learning experience it provides.

In a hypothetical test comparing traditional teaching and CBL teaching methods, students showed a more favorable impression of the CBL approach [11]. CBL received a higher proportion of satisfied responses compared to the traditional method, which had more dissatisfied responses. Both methods were considered beneficial, but after using CBL, there was a significant improvement in Group H2's mean score, indicating a more positive perception of its capacity to enhance educational experiences. Overall, our findings strongly support the idea that CBL enhances the learning experience compared to traditional teaching methods.

CONCLUSION

The study on "introduction of case-based learning (CBL) for teaching medicine in phase 2nd M.B.B.S. students" is highly recommended. It reveals that 2nd-year medical students prefer CBL, finding it more engaging and effective for understanding and applying medical concepts. The research highlights enhanced comprehension, lasting impact, practical application, real-world exposure, SDL, and professionalism development as key outcomes, emphasizing the significant benefits of CBL in medical education.

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AUTHORS' CONTRIBUTION

All the authors have contributed equally.

CONFLICT OF INTEREST

The authors declare no conflicts of interest.

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