Original Research Article

Student Perspectives and Force field analysis on Case-Based Learning in Medical Education: Kirkpatrick Level 1 evaluation

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Abstract:

Background: Health professional schools have been challenged to prepare their students to meet the evolving health care needs of society. In the current scenario, student centered teaching learning methods such as Case based teaching learning method are of at most priority to facilitate undergraduate students to acquire core skills of higher education. Studies are needed to understand the perception of the students and the factors to be addressed for implementation of the case based learning. **Aim and Objectives:** The objectives of the study are to evaluate the perception of undergraduate students on Case based learning, using structured feedback questionnaire and to conduct a comprehensive evaluation of the case-based learning method in medical education through Force Field Analysis. **Methods:** Kirkpatrick Level 1: Reaction to the case-based learning method was collected from first year undergraduate students using structured and validated feedback questionnaire. Force Field Analysis conducted for analyzing a change process by identifying and evaluating the driving forces and restraining forces. **Results:** Most of the study participants agreed that CBL is an effective teaching learning method for undergraduate education. Participants felt that this method of learning will help them to apply basic science concepts effectively during future clinical practice. It is evident that the driving forces supporting the adoption of case-based learning outweigh the restraining forces as per the force field analysis. **Conclusion**: The information generated can be of immense help to academicians to use case-based learning in the current CBME curriculum rolled out by National Medical Commission.

Keywords: case based learning, force field analysis, medical students, perception.

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Introduction:

Learning Physiological concepts form the basis for understanding the pathophysiology of various medical diseases. In-depth learning of basic science subjects in the preclinical years are of immense importance as they form the pillar of clinical learning in the subsequent years. Medical schools should update to innovative teaching learning methods to maintain excellence in medical education.

There should be a shift from teaching methods which are teacher-centered (product based) to a more of student-centered (process based). The student- centered teaching strategies encourage students to be active in the experience of learning rather than being passive learners.[1]

Case Based Learning (CBL) method is an educational paradigm used in higher education to provide integration of basic science concepts to clinical application. It is one of the effective student centric learning methods which makes use of guided enquiry and discussions on real or simulated case scenarios and is typically employed during small-group educational sessions.[2] CBL is proven to be an educational tool for facilitating the development of problem solving, critical thinking and self-directed life-long learning skills among undergraduate students.

There is an emphasis on introduction of both horizontal and vertical integration to bridge the gap between theory and practice, and an early clinical exposure in the form of introduction of case scenarios for classroom discussion/case-based learning (CBL) during first year of medical education in the revised CBME curriculum.[3]

Case Based Learning has been shown to impart early clinical exposure to students during pre, para clinical years which helps to link clinical conditions to basic sciences and develop clinical reasoning from first year of medical college. Learning and its retention is enabled when the topic is connected to real-life situations, since the students realize the necessity of understanding the topic for future clinical practice.[4]

There are limited Indian studies on perception of students on various student centric teaching learning methods The feedback or students' opinion will help medical educators to adapt these strategies for the current Competency Based Medical Curriculum rolled out by National Medical Commission.[3]

Hence the present study was undertaken to evaluate the perception of undergraduate students on Case based learning, a student centric Teaching Learning strategy using structured feedback questionnaire. This study also aims to assess the factors influencing the adoption and effectiveness of case-based learning, identify the key driving and restraining forces through force field analysis.

Aim and Objectives:

- The first objective is to evaluate the perceptions of first year medical students on Case Based Learning (CBL) method using structured feedback questionnaire
- The second objective is to assess the factors influencing the adoption of case-based learning, with a focus on identifying the driving forces that support its implementation and restraining forces that hinder it by conducting Force Field Analysis.

Materials and Methods:

This study was conducted in a private medical college after getting approval from the Institutional Ethics Committee. After getting the informed consent, the first year Bachelor of

Medicine, Bachelor of Surgery (MBBS) students (n-500) were recruited for the CBL Sessions. The CBL session was conducted during 2 hours tutorial session of regular schedule. The feedback regarding case-based learning method was collected from 500 first year undergraduate students using structured and validated feedback questionnaire containing open and close ended questions.

Evaluation of learning outcomes Kirkpatrick's four-level evaluation model is a commonly used educational evaluation model because it focuses on program learning outcomes and its clear description of outcomes including simple learner satisfaction.[5] Level 1 – Reaction- is the Learner's satisfaction or reaction to the program.

Statistical analysis of qualitative data: Kirkpatrick model of evaluation for Level 1: Reaction to the program. We assessed "Reaction" to the introduction of different teaching learning methods (intervention) using validated feedback questionnaire containing open and closed ended questions. The feedback questionnaire had items on evaluation of different aspects, of the like quality of the program, usefulness of the intervention, its strengths, and areas of improvement.

The feedback questionnaire had closed ended questions for which the students responded on 5-point Likert's scale. The overall feedback of participants on various aspects of CBL are scored on a five-point Likert scale, with a score of 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = Agree and 5 = Strongly agree. It was then simplified to 3-point Likert scale. The scores of 5-point Likert scale were calculated and expressed as percentages to indicate agreement or disagreement of students regarding the statements in the questionnaire. The questionnaire also had open-ended questions for which participants responded with narrative comments.

The responses of participants for open ended questions were transcribed word by word verbatim in a word document. The transcribed data was analyzed by deductive approach. The data was coded by three researchers and then grouped in to themes based on their similarities and differences. The themes were identified after coming to consensus among three researchers. Major themes and comments assigned to each theme are tabulated for each method.

A Force Field Analysis is a useful tool for analyzing a change process by identifying and evaluating the driving forces (those supporting the change) and restraining forces (those opposing the change). The objective of this Force Field Analysis is to assess the factors influencing the adoption of case-based learning, with a focus on identifying the driving forces that support its implementation and restraining forces that hinder it.

The factors based on the feedback from the students and faculty and based on the factors experienced during the implementation were grouped as driving forces and restraining forces.

Results:

The level1:Reaction of Kirkpatrick evaluation model was assessed using qualitative analysis of feedback on for case-based teaching learning from 500 first year undergraduate medical students.

Perceptions of participants on Case Based Learning Method is reported in proportions and is given in Figure 1.

Figure 1: Perceptions of participants about the Case Based Learning Method

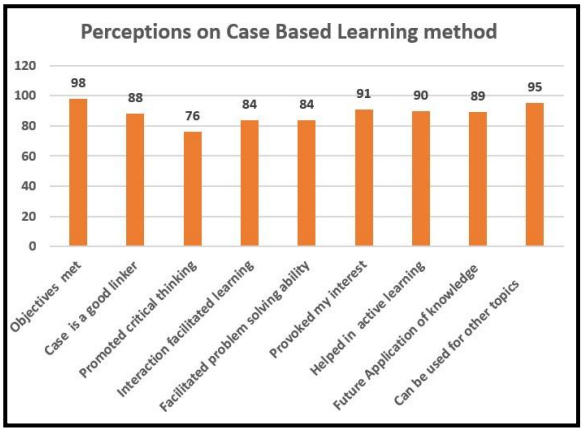


Table 1: Feedback of participants regarding what they "liked the most"about the CBL method

Themes emerged	Actual responses of participants
"Integration of Theory to clinical application"	"I really like case-based scenario and their reasons for understanding the topic".
"Promoted critical thinking"	"CBL sessions are really helpful in developing a clinically applied critical analysis of patient cases. This can improve our efficiency as future doctors".
"Facilitates Active learning"	"the interactive learning session kept us active throughout class and helped in better learning"
"More CBL sessions in future"	"Make it fully case-based learning"
	"Please have more such sessions, as it clears the missed concepts and doubts"

Table 2 : Feedback of participants on"suggestions for improvement"

Themes emerged	Actual responses of participants
More effective e-content	"it should be made more interesting by adding video clips of the disease so that we can understand better"
	"Videos and more animation images related to the case study will give a better idea to learn future topics"
More interaction with students	"more cases and longer discussions for better understanding"
	"Allow more interaction with facilitator for learning "

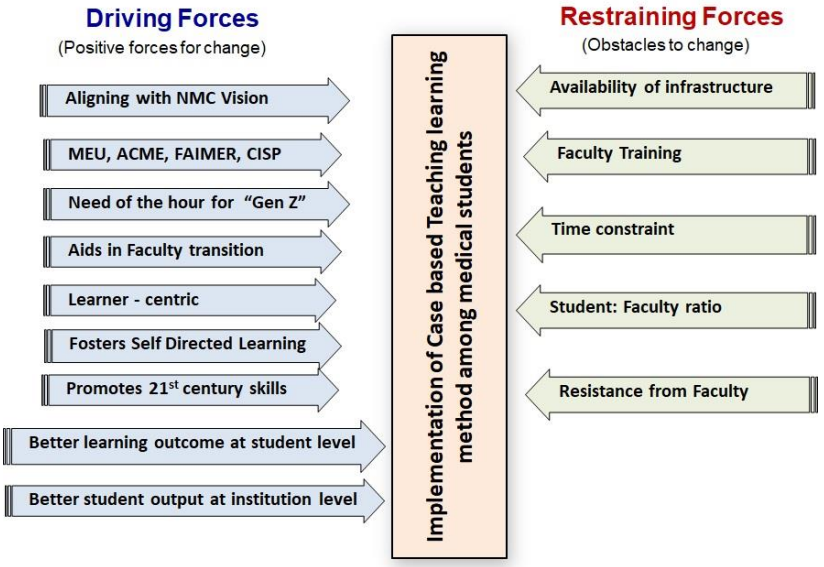
Most of the study participants agreed that CBL is an effective teaching learning method for undergraduate education. The main factors which favored their learning during CBL are, the linking the case with basic science concepts (86%), problem solving approach (84%) employed to stimulate their understanding on the topic and the interaction among students and facilitator-student interaction (86%), these factors provoked their interest (90%) towards learning. Participants also opined that the case-based approach promoted critical thinking skills, and facilitated active learning (90%) during the session. Participants also felt that this method of learning will help them to apply basic science concepts effectively during future clinical practice and most of them wanted CBL method to be used for other topics as well.

Results of Analysis of open-ended questions of Feedback survey:

The major themes identified from qualitative analysis of open-ended questions and the actual comments assigned to each theme are tabulated in the table 1 and 2.

The responses of participants to "what they liked the most with the CBL session" was categorized under various themes. Major themes which emerged out of participants feedback was "Integration of Theory to clinical application", "Promoted critical thinking", "Facilitates Active learning", and "More CBL sessions in future". The responses of open-ended questions were almost like closed ended questions. The themes emerged for "suggestions for improvement" are" More effective e content" and "Increased interaction time." The students feedback on "suggestions for improvement" indicated that participants wanted the content presentation to be more multimedia based. The students wanted video clips and animations to explain the physiological concepts. Other suggestion was to have more time for peer and facilitator interaction. It was also agreed by participants that the small group interaction during CBL method improved their understanding and reasoning ability on the topic.

Figure 2: Force Field analysis – Driving forces and Restraining forces for Implementation Case Based Teaching Learning Method



Discussion:

After evaluating the driving and restraining forces, it is evident that the driving forces supporting the adoption of case-based learning outweigh the restraining forces. This suggests a favorable environment for the implementation of case-based learning. However, it is crucial to acknowledge and address the restraining forces to ensure a smooth transition and maximize the benefits of this pedagogical approach. This study was conducted among 500 undergraduate medical students of SRIHER, a tertiary care medical institution in India. The study participants were undergraduate students belonging to 2 batches of first year MBBS students of both the sexes and in the age group between 18-20 years.

The level 1 Kirkpatrick evaluation: Reaction was assessed using qualitative analysis of feedback on each tool which showed that these methods were well received and participants opined that these tools provoked their interest to learn the topics and wanted them for future learning. The feedback response of participants to Case Based Learning method was very positive and welcoming. The students of this study agreed that these methods enhanced academic performance through higher order learning such as problem solving and critical thinking. There was also facilitation of development of soft skills such as communication, team work and interpersonal skills. They also nurtured the core skills of higher education such as self- directedness, goal-oriented learning and contextual learning.

The study reveals that a significant majority of students exhibit favourable perceptions of case-based learning in medical education. These perceptions are characterized by a strong preference for this pedagogical approach, a recognition of its effectiveness in promoting critical thinking and problem-solving skills, and a belief that it enhances their overall learning experience. This suggests that case-based learning is well-received among the student body and holds promise as an effective teaching and learning method in medical education."

According to previous studies, CBL teaching strategy has the advantage of providing opportunity to perform in-depth analyses and apply critical thinking to realistic, complex patient care situations in a safe environment.[6,7] CBL also promotes goal-oriented method of learning, one of the main adult learning principles that facilitates critical thinking because it makes learning more participatory, focused and structured, also encourage learners to take responsibility for their learning.[8] It has been strongly recommended that critical thinking should be introduced right in the first year of the MBBS course as learning basic sciences in a clinical context helps in creating a natural bridge to pathophysiology and clinical medicine taught later in the curriculum.[9] Previous study has shown the keenness and readiness of the students to adapt to new technologies and interventions.[10]

The other CBL characteristic which facilitates the effective learning is learning to learn in a collaborative group-centred environment.[11] The small group interactions with peers and facilitators give opportunities to the learners to apply what they have learned and allow exchange of information and construction of knowledge.[12] Interactive learning in groups increases their attention span and motivation, and reduce the monotony of passive learning. The student interaction also enhances the student's level of understanding and their ability to synthesize and integrate material.[13,14] This kind of Inquiry-based learning emphasizes constructivist approaches to learning, with knowledge being acquired in a series

of steps and through group processes.[1] This process of Case Based Learning fosters a deep approach to learning, and allows students to move from acquiring and reproducing knowledge, to seeking meaning through the application of knowledge which is different from traditional pedagogical approach.

Driving forces outweigh the restraining forces as per the force field analysis of CBL. When the driving forces for case-based learning surpass the restraining forces, it indicates a favorable environment for the adoption of this teaching method. It suggests a positive outlook for the enhancement of medical education through case-based learning, with opportunities for growth and improvement. However, it is important to continue monitoring and addressing any remaining challenges to ensure a successful transition.

Case Based Learning method can be an effective teaching learning tool in preparing the first-year medical students for a better clinical learning and patient care as it provides, relevance to the adult learner, and induces learning at a deeper level. Case Based Learning has been shown to enhance holistic development of clinical knowledge, skills and practice behavior towards patient care and thereby improving patient outcome. Global studies have demonstrated that CBL can bring about behavioral change among Physicians and dental students as it promotes higher level of mental processing.[16] Hence CBL strategy can be used as an effective adjunct to the traditional lecture format to promote better clinical learning and patient outcome.

Recommendations:

To further promote case-based learning, it is recommended that:

1. Institutions provide support and training for faculty to effectively integrate case-based learning into their teaching practices.
2. Adequate resources, both financial and technological, should be allocated to support case-based learning initiatives.
3. Curriculum committees should explore opportunities for flexibility and adaptability to accommodate case-based learning approaches.
4. Continuous assessment and evaluation should be carried out to refine and optimize case-based learning methods.

Overall, with proactive steps to address the restraining forces, case-based learning, an accepted method by students, can be a powerful tool for enhancing the quality of education.

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Conflict of interest: Nil

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