Comparative study of case based learning to traditional teaching method in the students of third BAMS

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Abstract:

In teaching process, many times we focus on factual recall rather than reasoning skills, learners are not actively involved and little opportunity is given for reflection of the learner. It is important to impart effective learner centered education with allotted time period. Also, learner should be given opportunities to develop their own understanding and self directed learning. Case based learning is a teaching learning method, adopted especially in medical field. This project was conducted to compare case based learning (CBL) over traditional teaching method (TTM). The study was conducted on 24 participants. Three Sessions each of one hour using TTM were taken on the disease *Rajyakshama*. Case based learning was introduced and total three sessions were used on disease *Galganda*. Post test for each teaching learning method was obtained and analyzed with paired t test. Feedback in form of questionnaire was taken. We found that CBL is more effective than the TTM ($p<0.001$). Case based learning motivated students for fact finding, reasoning, and self learning.

Keywords: Case based learning (CBL), Traditional teaching method (TTM), Teaching-Learning method.

Introduction:

All doctors are involved in teaching at some point in their careers. Many of them take this job enthusiastically with dedication and devotion. Igniting the flame of knowledge in the learner's mind is a noble job. Conventionally there is an assumption that if a person simply knows a lot about their subject they could teach it. In reality, although subject expertise is important it is not sufficient. Effective teaching plays very important role in acquiring knowledge with long term impact. In teaching process many times we focus on factual recall rather than reasoning skills where learners are not actively involved and little opportunity is given for reflection of the learner.

To overcome these lacunae, it is very important to impart effective learner centered education with proper justice to the time allocated; learner should be given opportunities to develop their own understanding and self directed learning, combined with dialogue with their teachers and peers (1). CBL, a very well known teaching- learning method, adopted by many especially in medical teaching is very useful. CBL helps learner to identify what they already know and to restructure, elaborate their knowledge and provide bridge between existing and new information. Moreover CBL is student centered, taken in small groups where teacher acts as facilitator or guide. Problems are the vehicles for development of problem solving skills. New information is acquired through self directed learning (2). Also group discussion which is the part of CBL if effectively practiced develops a range of soft skills such as self expression, listening, collaboration and problem solving (3). Learner can be given some challenging task, which they could solve independently and work with teachers and others. As they develop the abilities required, they shall receive less assistance and work more independently. Learning

should be closely related to the understanding and solution of real world problem (4). It has been reported that medical graduates in India generally possesses reasonably sound knowledge of medical science but they are often found deficient in the performance of clinical skills and problem solving, which form the core of clinical competence (5). CBL is one method where students are motivated to learn on their own so as to inculcate the habit of self-learning and integrating knowledge from different subjects to solve problems. It is a small-group method in which both students and faculty members contribute to discussion, learning issues are pre identified, and preparatory readings are assigned while student discussion and guided inquiry around clinical problems is promoted (6).

The clinical and diagnostic parameters and the treatment is mentioned in the *samhita* in form of *sutras*. The challenges in front of students of Ayurveda are increasing day by day. The subject of *Kayachikitsa* is introduced to the III BAMS students, which involves teaching and learning of history taking, examination, patho-physiology (*Samprapti*), laboratory investigations, complications, treatment, record keeping, good communications, counseling, team work, leadership skills etc. In CBL, a real world scenario with the supporting data and documents is given with open ended questions and the case content is closely aligned with the overall instructional goals and objectives. The learner is asked to read, identify, establish, discuss, and reflect on these goals and objectives. Wilkerson and Gijselares correctly described as the teacher in such TL method is facilitator rather than disseminator, observer rather than actor. They coach from the sidelines providing constructive feedback and challenging students to excel (7). Many times, medical teaching gets restricted to didactic lectures, seminars, practical and this is most of the time teacher centered. As per Author Jena Vellas view “Adult learners have shown that they are willing, eager to learn in safe learning environment. Allowing small groups to find their

voices enhance the power of safety. Trust in the sequence of activities builds safety where CBL is used" (8). CBL can be defined as a process in which by discussing a clinical case related to the topic taught, students evaluated their own understanding of the concept using a high order of cognition. This process encourages active learning and produces a more productive outcome (9-10).

Aim:

- To motivate knowledge acquisition by case centered learning.
- To motivate student for self learning, to analyze and to develop problem solving skills.

Objectives:

- To introduce CBL and compare its effectiveness over traditional teaching learning methods (Didactic lecture).
- To develop the soft skills such as self expression, listening, collaboration and problem solving.

Materials and Methods:

This experimental study was conducted on 24 students of III BAMS after seeking permission from institutional ethical committee. Clear idea of the research project was given to all the students and consent was taken from students willing to participate in project. Two ideal case scenarios on the topic of *Rajayakshama* and *Galganda vyadhi* were prepared, and pre validated by the faculty of *Kayachikitsa* department. Specific learning objects (SLO) were decided.

First intervention:

Three sessions each of one hour using TTM (didactic lecture) were taken on the topic of *rajayakshama vyadhi*. Pre and post test was taken on the traditionally taught topic, consisted of short answer questions (SAQ) of 20 marks within the time period of 30 minutes.

Second intervention:

CBL was introduced and total three sessions were conducted. During 1st session, two cases were introduced to the students and relevant study material references were given. 2nd session was given to the students for reading to find the learning trigger, establish connection, discuss, explore, compose and finally reflect. In the groups there was one leader, one time keeper, one scribe, and teacher as facilitator. In 3rd session there was discussion, briefing by faculty, followed by post test. Feedback by using 5 point Likert scale was obtained from the students in form of pre validated questionnaire which consisted of both close ended as well as open ended questions. Unpaired t test was applied for comparison between the scores obtained in post test of both teaching learning methods.

Results:

24 students gave the feedback for both the teaching methods (Table 1 and Fig. 1).

Table 1: Mean of marks obtained after TTM and CBL

TL method	Mean	SD	SE	p value
TTM	13.5	1.91	0.39	P<0.001
CBL	15.63	2.30	0.47	t = 4.584 df = 23

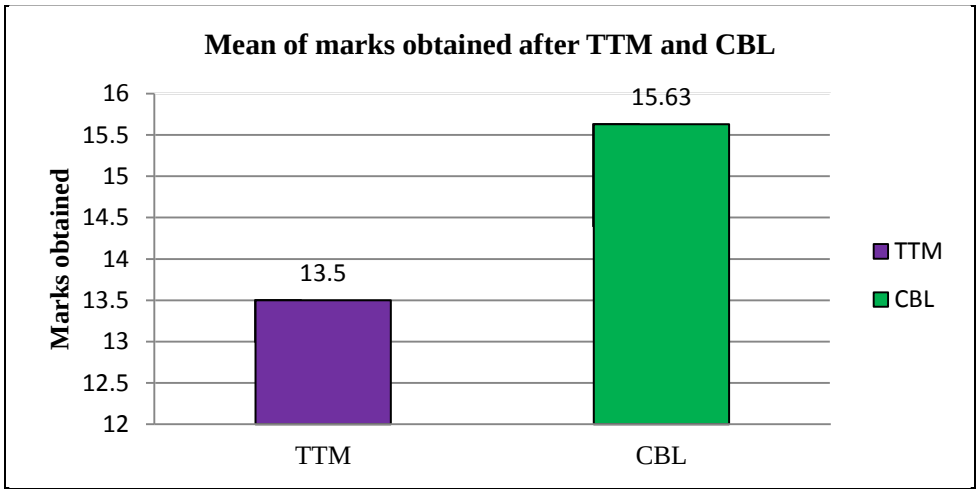

Figure 1: Mean of marks obtained after TTM and CBL

There was significant difference in the knowledge gain of the student as their performance in post test of CBL was better as compared to TTM post test score ($p < 0.001$). Students perceived CBL as a better TL method than Traditional TL method (TTM- didactic lectures). 83.33 % of students strongly agreed that CBL method was interesting and 63 % students found the TTM to be non-interesting. 75 % students strongly agreed that CBL motivated them to read more, enhance self learning, and hence better understanding was achieved. While 66.67 % of students found that TTM didn't motivate them to read more, 41.67 % said that there was no better understanding with TTM method while 45.83 % had neutral opinion about better understanding through TTM. 54.17 % strongly agreed, and 45.83% agreed that CBL helped them to memorize the facts easily and also increased their group interaction and made clinical learning easier and enjoyable. While 83.33 % students said that TTM doesn't increase any group interaction, neither learn through this method is easier or enjoyable. 58.33 % students strongly agreed that CBL method increased their sensitivity towards patient's problem. 79.17% strongly

agreed that this method of CBL should be continued and to be regularly implemented, while 16.67 % of students suggested to discontinue TTM (Table 2 & 3 and Fig. 2& 3).

Table 2: Analysis of percentage of student's feedback after TTM

Feedback analysis (n=24)						
Sr. No.	**Questions**	**Strongly disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
Q.1	Method is interesting	7 (29.17%)	8 (33.33%)	8 (33.33%)	0	1 (4.17%)
Q.2	Motivated to read more and enhanced self learning	6 (25%)	10 (41.67%)	7 (29.16%)	1 (4.17%)	0
Q.3	Better understanding	3 (12.5%)	7 (29.17%)	11(45.83 %)	3 (12.5%)	0
Q.4	Motivated critical thinking and analytical skill	7 (29.17%)	9 (37.5%)	6 (25%)	1 (4.17%)	1 (4.16%)
Q.5	Helped in memorizing the fact easily	4 (16.67%)	10 (41.67%)	5 (20.83%)	5 (20.83%)	0
Q.6	Helped fact finding and correlating Ayu. Principles of diagnosis and management	5 (20.83%)	8 (33.33%)	9 (37.5%)	1 (4.17%)	1 (4.17%)
Q.7	Increased group interaction and made clinical learning easier and enjoyable	10(41.67 %)	10 (41.66%)	3 (12.5%)	1 (4.17%)	0
Q.8	Increased sensitivity towards patients problem	5 (20.83%)	9 (37.5%)	7 (29.17%)	2 (8.33%)	1 (4.17%)
Q.9	Gives confidence in bed side case presentation	10(41.67 %)	8 (33.33%)	3 (12.5%)	2 (8.33%)	1 (4.17%)
Q.10	To be continued and implemental	7 (29.17%)	8 (33.33%)	5 (20.83%)	4 (16.67%)	0
(**SDA=** Strongly disagree, **DA=** Disagree, **N=** Neutral**, A=** Agree & **SA=** Strongly agree)						

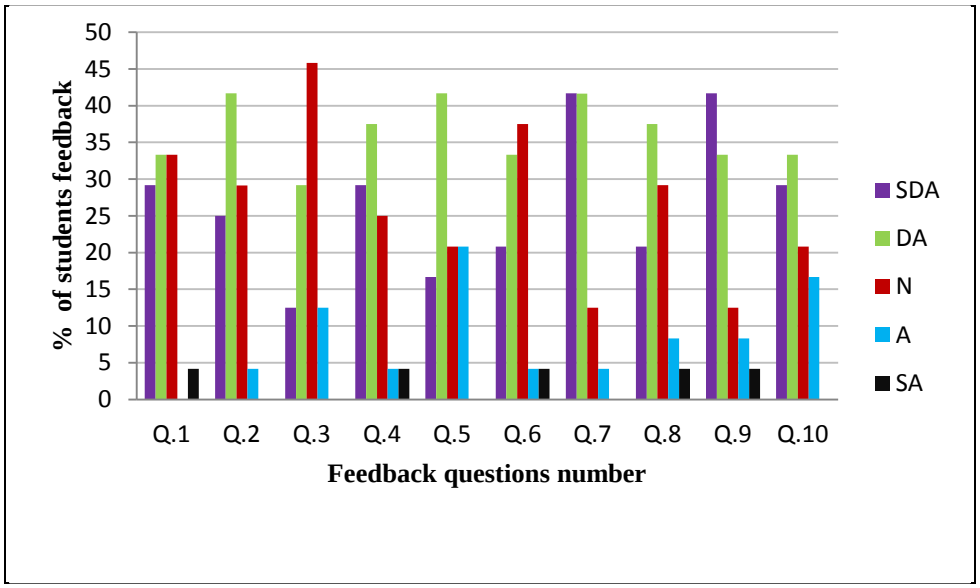

Figure 2: Feedback of students' perception on each question after TTM

Table 3: Analysis of percentage of student's feedback after CBL

Feedback analysis (n=24)						
Sr. No.	**Questions**	**Strongly disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
Q.1	Method is interesting	0	0	0	4 (16.67%)	20(83.33%)
Q.2	Motivated to read more and enhanced self learning	0	0	0	6 (25%)	18 (75%)
Q.3	Better understanding	0	0	0	6 (25%)	18 (75%)
Q.4	Motivated critical thinking and analytical skill	0	0	0	7 (29.17%)	17(70.83%)
Q.5	Helped in memorizing the fact easily	0	0	0	11(45.83 %)	13(54.17%)
Q.6	Helped fact finding and correlating Ayu. Principles of diagnosis and management	0	0	2 (8.33%)	9 (37.5%)	13(54.17%)
Q.7	Increased group interaction and made clinical learning easier and enjoyable	0	0	0	10(41.76 %)	14(58.33%)
Q.8	Increased sensitivity towards patients problem	0	0	3 (12.5%)	9 (37.5%)	12 (50%)
Q.9	Gives confidence in bed side	0	0	0	9 (37.5%)	15 (62.5%)

	case presentation					
Q.10	To be continued and implemental	0	0	0	5 (20.83%)	19(79.17%)
(**SDA=** Strongly disagree, **DA=** Disagree, **N=** Neutral**, A=** Agree & **SA=** Strongly agree)						

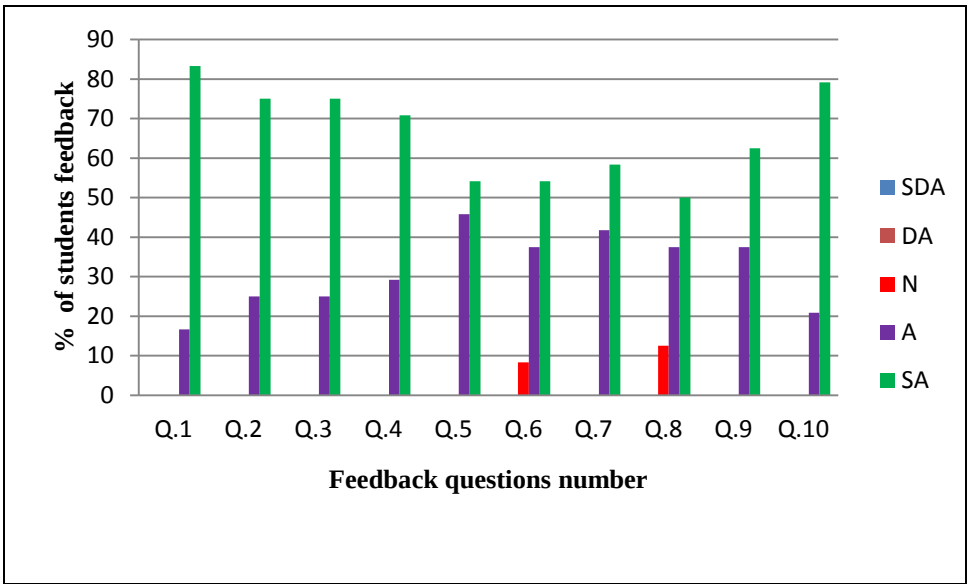

Figure 3: Feedback of students' perception on each question after CBL

Discussion:

Correct diagnosis, perfect application of Ayurvedic treatment certainly gives rewarding success which leads to good research work. For this purpose, the student should know the detailed nidan-panchak with the various treatment options. The subject of *Kayachikitsa* is introduced to the III year B.A.M.S. students, which involves teaching and learning of history taking, examination, patho-physiology (*Samprapti*), laboratory investigations, complications, treatment, record keeping, good communications, counseling, team work, leadership skills, etc. To get well versed with the patho–physiology and symptoms of the various diseases so as to make perfect diagnosis, it is necessary for the learners to study various cases. Subject of *Kayachikitsa* is generally taught with help of didactic lectures, practical, and tutorials, as we

know these methods are teacher centered and learners play a passive role. Hence considering the above facts and also to gather perception of students regarding CBL and to compare effectiveness in teaching learning methods we selected the topic of case based learning.

In CBL, a real world scenario with the supporting data and documents is given with open ended questions and the case content is closely aligned with the overall instructional goals and objectives. This certainly gives learner an opportunity to develop their own understanding and self directed learning, combined with dialogue with their teachers and peers. We found that CBL was more interesting than traditional teaching method. Participants enjoyed as they were given a challenging task which they could solve independently and work on these with teachers and others. As per the feedback, adult learners were willing to learn in safe learning environment.

As the students are passive learners in traditional teaching method, here in CBL one has to actively participate in group activity increasing the group interaction. Team work is a principle of adult learning as well as an effective practice (11). Group discussion also enhances better understanding of the given topic. It motivated them to read more. They also agreed that CBL helped them to memorize the facts easily and also increased their group interaction and made clinical learning easier and enjoyable also CBL method increased their sensitivity towards patient’s problem.

It was also observed that CBL not only enhances subject knowledge but also help learners towards good diagnosis, perfect application of Ayurvedic treatment, good communications, listening skills, counseling, team work, leadership skills.

Conclusion:

CBL method was found to be more effective than traditional TTM in form of didactic lecture. Better understanding of the topic, better memorization, enhanced self learning, and

reading in very comfortable and joyful environment helped them to score better. CBL also motivated them for fact finding, reasoning and self learning. Studying the topics in form of case gave them confidence in bedside case presentation, also to focus on important, relevant and specific observations (symptoms, signs, systemic examination and necessary investigations) during patient examination in wards in the allocated time. In the CBL, the learning opportunities can be maximized with the minimal disruption to the staff, patients and relatives.

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