

**A study on the Perceptions of Team-Based Learning in Community Medicine among Phase Three (Part One) Students in a Medical College in Telangana.**

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**Background:** The adoption of TBL is an effective TLM as it envisages students working in teams to resolve the clinical-practice-related issues. The current study was undertaken to gauge the perceptions of UG students in phase-3 of their MBBS course as regards TBL. **Materials and Methods:** A qualitative cross-sectional study was conducted among phase-3 (part-1) students, for 2 months, in Bhaskar Medical College, Telangana. Google forms for RATs and a 20 item TBL-SAI was readied wherein perceptions had to be marked on 4 subscales, on a Likert scale. Students were sensitised, reading material shared and 10 teams each of 8-10 students were formed. Four TBL sessions were held in which *iRATs*, *tRATs* & *Case-based scenarios* were administered. Correct answers for RATs and cases were discussed with teams answering and presenting their cases. During the last session, TBL-SAI forms were administered. Scores were analysed as percentages and Excel software was used to bring about Correlation between variables. ANOVA was used to reject/accept Null hypothesis. **Results:** High correlation was found when it came to students' accountability aspect. TBL was rated significantly superior to traditional lectures. Students had a satisfactory experience and enjoyed the activities, and learnt better with TBL. The correlation between problem-solving and other variables was found to be very high in TBL. **Conclusions:** There was an enhanced understanding of concepts and principles of interactive and applied learning activities among the students. Experience with TBL was promising in terms of accountability, preference for learning mode, students' satisfaction and benefits obtained. Provision of immediate feedback helped students learn better.

**Key Words:** Team Based Learning, RATs

## Introduction

Owing to the rapid advancements in the field of medicine, it is a major challenge for the medical educators to prepare the students to be ready and competent in their future clinical practice. It is a must that the medical students should not only be knowledgeable and skilled but also acquire the trait of being a lifelong learner.

The adoption of Team-Based Learning (referred to as TBL henceforth) is an effective teaching-learning strategy to prepare the medical students for all the above roles, as it envisages working in teams to resolve the clinical-practice-related issues.<sup>1</sup> Team-based learning (TBL) provides an active, structured form of small group learning that can be applied to large classes. Student accountability is achieved through the specific steps of TBL, including pre-class preparation, readiness assurance testing, problem-solving activities, and immediate feedback. Globally, a growing number of healthcare faculties have adopted TBL in a variety of combinations, across diverse settings and content areas.<sup>2</sup>

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In reality, medicine cannot be practiced in isolation and therefore exposure to TBL methods will strengthen the knowledge and skills of the future clinician in problem-solving as a team.

Keeping these points in mind a study was done to gauge the perspicacity of under-graduate (UG) medical students of Community Medicine in phase three of their MBBS course as regards TBL, as a relatively newer methodology of teaching-learning; with an aim to instill a nuance of this method as a means of covering the Competency-based medical education (CBME) UG curriculum in future.

### Materials and Methods

- **Type of study-** Qualitative
- **Setting:** Classroom
- **Duration:** 2 months (April-May 2024),
- **Sampling method:** Convenience (or universal) sampling.

**Sample selection:** All students of phase 3 (part-1) were to be included in the study. Those present were included in the study on the first day itself. However, absentees on the first session on the first day were excluded from the study, even if they came on subsequent days.

During the first session 110 students were present of which a sample of 104 legitimate responses was obtained. Rests 48 in the class of 158 were absent.

Participation was voluntary and only after due informed consent was obtained.

**Ethical Approval:** Obtained from the Institutional Ethical Committee.

**Study design:** Descriptive, Cross-Sectional.

### Methodology

1. To start with, the students were sensitized about the fundamentals and philosophy of TBL methodology. The chapter chosen (*Principles of Epidemiology and Epidemiological Methods*) in alignment with the CBME curriculum mapping the learning objectives and the competencies was informed to the student participants. It was stressed that they would have to answer Multiple-Choice Questions (MCQs) on parts of the chapter assigned for each session, over 4 such, and that they will not be assessed but have to render their perceptions on TBL at the end of the fourth session.
2. Dates of the 4 TBL sessions (theory classes as per time-table) were finalized with the Dept.'s HoD. Four Individual Readiness Assurance Test (iRAT) and Team Readiness Assurance Test (tRAT) comprising of the same 10 MCQs in each and 4 case-based problems (CBE) were prepared, after dividing the chapter of Epidemiology into 4 parts. So the first RATs and CBE had the questions and exercise from the first part of the divided chapter for the first session, and so on.
3. A week prior to the first session of TBL, topics and sub-topics from the concerned chapter were assigned to the students for self-study. A PowerPoint presentation was also shared in this regard. A week's time was given for preparation.
4. On the day of the first session, firstly the iRAT was shared with the participants in a Google form and 10 mins were allotted for them to submit their answers. Next, the students included in the study, were divided into small teams comprising of 8-10 members each. Ten teams were formed for the TBL sessions. The tRAT comprising of

the same MCQs was administered to the teams, with instructions to discuss among them and keep the answers ready. Ten mins were allotted for this too.

5. Once both iRAT and tRAT were over, the correct answers were informed to the students, so that they themselves could assess their performances both as an individual and as a team.
6. Lastly, the teams were given the CBE in which the participants had to apply their knowledge, discuss as a team and come up with answers/solutions on the given issue. All the teams had to work simultaneously to resolve the problem in 20 mins time allotted. Then each team had to come forward one by one, and provide their answers/solutions. Some peer to peer discussions were expected. Finally, faculty in-charge summed up the session and provided the exact solution for the CBE.
7. The iRAT, tRAT and CBE were repeated for 3 more sessions with different portions of the chapter, as mentioned above. Each time a week was given to the students to go through the shared and reference material.
8. After the fourth session, a 20-item *Team Based Learning Student Assessment Instrument* (TBL-SAI), a Google form questionnaire on a Likert Scale prepared in consultation with other faculty members was administered to the participant students and their perceptive responses on 4 subscales– *Accountability, Preference for Lectures or TBL learning, Student Satisfaction and Benefits/Drawbacks of TBL*- obtained. The TBL-SAI questionnaire of Heidi A. Mennenga was studied before making the proforma for the present study<sup>3</sup>. It may be mentioned here that Mennenga's instrument has 33 items (with total scores ranging from 33-165) in 3 subscales – accountability, preference and satisfaction.

**Statistical analysis**– Scores given by the participants on the Likert scale were analysed in the form of percentages. Microsoft Excel software used to bring about the Correlation (r) between variables discussed under the subscales of accountability, student satisfaction and benefits/drawbacks of TBL. As regards the subscale comparing Lectures and TBL, Analysis of Variance (ANOVA) test with p and F & F critical (F crit) values were utilised to either reject or accept the hypothesis that there is no significant difference between the two methods of teaching-learning (null hypothesis).

## Results and Discussion

A total of 104 valid responses, were received from phase-3 (part 1) ie. 3<sup>rd</sup> year students. This compares well with a study done by Faezi et al in Iran where 84 3<sup>rd</sup> year medical students participated in a study to know the effects of TBL<sup>4</sup>. In 2020, Mutasim E Ibrahim assessed 109 students from 2<sup>nd</sup> - 4<sup>th</sup> years in a Saudi Medical school<sup>5</sup>. In the current study for all the 4 subscales mentioned under 'methodology, 5 degrees were given in the Likert scale for scoring, that varied from strongly disagree, to disagree, to agree, to strongly agree and finally very strongly agree.

It was observed that as far as *accountability* was concerned a majority of the students (87, 83.7%) felt that they were accountable for their team's performance, of which 37 agreed very strongly. This was the key question in this subscale. Again 85 of 104 (81.7%) agreed that they spent time in studying and preparing the topics given, before the tests. Ninety-one (87.5%) students felt they had contributed positively to their team, 79 (75.9%) felt they could meet other team members' expectations and 82 (78.8%) stated that they were proud of their ability to assist their teams in the learning process. The Correlation between accountability and all the above-mentioned variables was found to be very high (r = 0.91 to 0.98). The results are summarized in Table 1, below--

These results compare well with the Classroom Engagement Survey scores in the study done by Faezi et al which indicated a high level of engagement in TBL (Mean  $\pm$  SD =26.7 $\pm$ 3.70, p=0.0001) but not in the lecture-based

sessions (Mean ± SD=23.80 ± 4.35, p=0.09). The results of Faezi’s study too demonstrated a favourable accountability for the TBL group<sup>4</sup>.

**Table- 1:** Perceptions of students about **Accountability** factor in TBL (n=104)

Student perceptions	Strongly disagree		Disagree		Agree		Strongly agree		Very strongly agree	
	No.	%	No.	%	No.	%	No.	%	No.	%
Felt accountable for team’s performance	7	6.7	10	9.6	48	46.2	28	26.9	11	10.6
Spent time studying, preparing topics given	4	3.8	15	14.4	48	46.2	29	27.9	8	7.7
Contributed positively for team	5	4.8	8	7.7	39	37.5	39	37.5	13	12.5
Could meet team member’s expectations	4	3.8	21	20.2	42	40.4	26	25	11	10.6
Felt proud of ability to assist team in the learning	8	7.7	14	13.5	37	35.6	30	28.8	15	14.4

Very High **Correlation** observed between Accountability and studying aspect (r=0.98), High with other factors (r ranging from 0.9-0.96).

**Comparison of traditional lectures with TBL;** while 41 (39.4%) of the participants did not agree to thinking of other non-relevant things during traditional lectures, the bulk 63 (60.6%) of the class felt otherwise. The latter agreed that they were distracted during lectures but not during TBL sessions. Sixty seven (64.4%) students said that they were more likely to fall asleep during lectures, though the rest 37 disagreed. Majority 70 (67.3%) said that they got bored as well had poorer recall during lectures but not during TBL. Seventy two (69.2%) said they remembered less during lectures. The results are tabulated in Table 2.

Analysis of variance (ANOVA) has revealed that row-wise p<0.05, and so there is a significant difference between traditional lectures and TBL. Null hypothesis is rejected. Again, F value (9.87) was also found to be more than the F crit value (3.26), thus rejecting the null hypothesis. These results compare well with Feazi’s results which indicated that the effect of TBL on knowledge retention had become more pronounced over time<sup>4</sup>.

**Table -2:** Perceptions of students about **Lectures** versus **TBL** (n=104)

Student perceptions	Strongly disagree		Disagree		Agree		Strongly agree		Very strongly agree	
	No.	%	No.	%	No.	%	No.	%	No.	%
Thinking non-related things more during lectures than during TBL	17	16.3	24	23.1	31	29.8	20	19.2	12	11.5
More likely to fall asleep during lectures than TBL	16	15.4	21	20.2	32	30.8	17	16.3	18	17.3
Get more bored during lectures than TBL	17	16.3	17	16.3	28	26.9	23	22.1	19	18.3
Remember less during lectures than during TBL	16	15.4	16	15.4	43	32.7	27	26.0	11	10.6
Less recall during lectures than in TBL	11	10.6	23	22.1	43	41.3	19	18.3	8	7.7

**ANOVA** revealed that row-wise p<0.05, pointing towards a significant difference between traditional lectures and TBL. Null hypothesis rejected - F value (9.87) found to be > the F crit value (3.26), rejecting the null hypothesis.

A large number of students 85 (81.7%) thought that they had a satisfactory experience with TBL while responding to this key question in the *satisfaction* subscale. A larger number 87 (83.7%) stated that they enjoyed TBL activities. Again, the bulk of the class 83 (79.8%) reflected that they learnt and understood better in a team setting; and also thought that they could improve on their marks after TBL 77 (74%). A high degree of Correlation has been found between satisfactory experience and these variables ( $r= 0.80$  to  $0.89$ ). A study by Shirani and others too showed that students' engagement in the teaching and learning process resulted in reaching a higher level of understanding [6]. Most felt that there was less wastage of time during team sessions 70 (67.3%). These results are depicted in Table 3.

The Correlation between satisfaction and time factor was found to be very high ( $r= 0.95$ ). The present study demonstrated the learners' preference for TBL to the lecture-based sessions that was in line with many other reports [7, 8 and 9].

**Table 3.** Perceptions of students about **Satisfaction** with TBL (n=104)

Student perceptions	Strongly disagree		Disagree		Agree		Strongly agree		Very strongly agree	
Had good experience with TBL	14	13.5	5	4.8	37	35.6	34	32.7	14	13.5
Enjoyed TBL activities	11	10.6	23	22.1	43	41.3	19	18.3	8	7.7
Learnt better in TBL	6	5.8	15	14.4	36	34.6	32	30.8	15	14.4
Less time wastage during TBL	17	16.3	17	16.3	32	30.8	26	25	12	11.5
TBL can improve marks	10	9.6	17	16.3	34	32.7	30	28.8	13	12.5

A High degree of **Correlation** found between satisfactory experience and variables like enjoyed activities, learnt better and improvement in marks ( $r= 0.80$  to  $0.89$ ). Correlation between satisfaction and time factor was found to be very high ( $r= 0.95$ )

Finally in the *benefits-drawbacks* subscale, maximum respondents 87 (83.7%) felt that problem solving was easier with TBL. It may be recalled that case-based scenarios were given to the teams, and they discussed the same as a squad. Eighty one (77.8%) students vouched that their communication skills improved with TBL. An equal number mentioned that they did develop a sense of teamwork and learnt the art of decision-making by taking part in team-based activities 88 (84.6%). A good majority 87 (83.7%) said that they could think critically during the sessions. These figures are given in Table 4..

The Correlation between problem-solving and all the above-mentioned variables was found to be very high ( $r = 0.91$  to  $0.99$ ). The results compare well with the study by Abdelkhalik N et al where they used TBL to prepare medical students for future problem-based learning<sup>10</sup>.

Student perceptions	Strongly disagree	Disagree	Agree	Strongly agree	Very strongly agree
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**Table 4.** Perceptions of students about **Benefits/Drawbacks** of TBL methodology (n=104)

Student perceptions	Student perceptions		Strongly disagree		Disagree		Agree		Strongly agree	
	No.	%	No.	%	No.	%	No.	%	No.	%
Problem solving easier with TBL	8	7.7	9	8.7	43	41.3	30	28.8	14	13.5
Improved communication skills with TBL	9	8.7	14	13.5	51	49.0	20	19.2	10	9.6
Developed sense of teamwork with TBL	7	6.7	9	8.7	44	42.3	35	33.7	9	8.7
Could think critically during TBL sessions	8	7.7	9	8.7	44	42.3	31	29.8	12	11.5
Learnt art of decision-making	7	6.7	9	8.7	49	47.1	28	26.9	11	10.6

The **Correlation** between problem-solving and all the above-mentioned variables found to be very high ( $r = 0.91$  to  $0.99$ ).

**Limitations** - Firstly, although the study targeted only medical students of a particular phase, the sample size was limited and to some extent unbalanced. Secondly, since the study was carried out in a short span of 2 months over 4 sessions and limited to one particular chapter, this would have affected the final observations made and results obtained. Also, it is conjectured that the faculty involved as TBL facilitators are novices in the implementation of TBL, which might have caused some attitudinal predicament among students towards TBL.

### Conclusion

The Phase 3 (Part – 1) students were exposed to TBL methodology, a newer and more effective way of learning. Their perceptions on the importance of and gains by, using TBL strategy were assessed. It was observed that there was an enhanced understanding of concepts and principles due to interactive and applied learning activities, among the student participants. On the whole, the experience with TBL was promising in terms of accountability, preference for learning mode, students' satisfaction and benefits obtained.

It is felt that besides improving their socio-clinical knowledge and skills; the exposure to TBL methodology of teaching-learning will help improve their performance in the assessments during examinations in the community and clinical settings. In the long run, a flipped classroom approach, immediate feedback, peer reviews, and case based discussions will result in better outcomes for students, teachers and institutions. It is suggested that more longitudinal studies across all the academic phases of MBBS curriculum need to be carried out to provide a clearer picture of the acceptance of TBL

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