Education in Medicine Journal ISSN 2180-1932

ORIGINAL ARTICLE
Volume 7 Issue 3 2015
DOI: 10.5959/eimj.v7i3.347
www.eduimed.com

Attitude and Perception of Pediatric Clerkship students in Yemen towards Team Based learning: A Preliminary Study

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ARTICLE INFO

Received : 31/01/2015
Accepted : 30/06/2015
Published : 15/09/2015

KEYWORD

Attitude
Perception
Active learning
Team based learning
Clerkship

ABSTRACT

Introduction: Team based learning (TBL) is an innovative educational strategy that has been adopted by many medical schools all over the world. It has the advantage of active learning, critical thinking where the students learn to collaborate and communicate with one another in a single large classroom. In this study we explored pediatric clerkship students' perceptions and attitudes regarding team based learning at University of Sciences and Technology/Yemen with a view to build in novations and improvements on teaching methods. **Methods:** A pilot descriptive cross-sectional study involved thirty seven pediatric clerkship female medical students attended two hours session in May 2013 at University of Sciences & Technology/college of medicine in Sana's/Yemen. The session was converted from didactic into TBL one. The students participated in response to 14 statements at the end of the session. The internal consistency of the questionnaire items was determined by Cronbach's alpha. Student perceptions were assessed using a 5-point Likert scale with a score of five being strongly agree. Collected Data were analyzed using Statistical Package for the Social Sciences (SPSS 20). **Results:** all the 37 female students constituting the attending group responded. Internal consistency (Cronbach's alpha) of the 14 items was 0.931. Students' perceived TBL tutorial positively with about 94% of students agreed of positive impact of the session on their learning, and 92% agreed that the session helped them to work and learn in a team. Lower score of 62% were given to whether the session promoted understanding rather than memorization, and 60% of the students agreed of the achievement of learning objectives through TBL session. **Conclusions**: Clerkship Students' evaluations indicated that Team Based Learning is a welcome alternative to the didactic lecture. It adds ongoing evidence suggesting the effectiveness of TBL as an instructional technique that promote student engagement and learning in teams.

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Introduction

Traditional didactic teaching has been moved towards dialectic one such as that of problem based learning (PBL) of Barrows & Tamblyn (1) and recently Team Based Learning (TBL) of Michaelson (2). This approach has the advantage of the student being active, critical thinker, problem solver, and learns to collaborate and communicate with one another in teams. In addition to that TBL session could be introduced in a large single place such as a lecture hall and the problem is introduced at the end of the session, after the students are ready to solve clinical problem rather than that of PBL where

the problem is encountered first to trigger students' curiosity in the learning process. TBL has been introduced by Larry Michaelson in the early 1990s in the business school at the University of Oklahoma/USA.

During early application of some of small group discussion such as PBL, many problems have been encountered such as lack of participation, lack of interaction, lack of elaboration, lack of cohesion, lack of motivation and difficult personalities which lessened the productivity of the tutorial sessions (10), in addition, shortage of tutors and spaces in countries with limited resources (11), hence changes and further curricular development were needed and the introduction of TBL was an option. The TBL process emphasizes on team discussions as effective mechanisms for learning. Traditionally TBL consists of three main phases: (1) Advance preparation (pre-class) where the students prepare according to the session's objectives through allocated reading assignments. In class which includes: (2) Readiness Assurance Test (RAT) where the students are involved in solving multiple choice questions (MCQs) that cover the main learning objectives of the session. The students solve these MCQs first individually [individual 5 Readiness Assessment Test (iRAT)] and then the same questions are solved in groups [group Readiness Assurance Test (gRAT)], this step is followed by clarification by a knowledge expert instructor where the students receive immediate feedback on Readiness Assurance Test and have the opportunity to appeals if they have a valid argument for their answer to wrong question in the MCQs. In the final phase (Application), the students have the opportunity to practice a clinical problem solving exercise (2). The lectures at University of Sciences & Technology College of Medicine are delivered in a content-based, teacher-centered (didactic). We converted one paediatric traditional lecture into TBL session (dialectic) to evaluate the students' perception and attitude towards this innovative approach of team working, acquisition of course concepts by students independently, practice problem solving exercise, and our intention to build innovations and improvements on teaching methods.

Method

University of Sciences & Technology is the first private higher educational institute in Yemen which established in 1995. Its school of medicine has adopted organ based curriculum with a limited basic-clinical integration during the first four pre-clerkship years. The last two years (clerkship) are spent between the different clinical disciplines include paediatric in hospitals and community, with approximately 35 students in each cohort. Paediatric rotation is divided into hospital attachment at main hospitals in Sana'a city form eight o'clock in the morning till twelve midday, and regular scheduled didactic sessions from one till 4 afternoon. The block consists of 8 weeks of 12 credit hours (CR) with 8 CR for lectures per semester during the fifth year. Females are segregated from males during all teaching activities. The first semester allocates for female and the second one for males in alternate with obstetrics & gynaecology. Teacher or/and tutor -led Lectures/seminars is the main teaching method during the different stages of the curriculum. This is a pilot descriptive study conducted in May 2013 during a two hours paediatric review lecture on bleeding tendency. We had the agreement of the dean in introducing the TBL. The students were briefed one day for one hour before the session about the concept and steps of the TBL. The session topic was a review of previous information and experience of bleeding tendency in children. This considered as a pre-class preparation of TBL. The study involved 37 female fifth year clerkship students. The students were divided randomly by the tutor into seven teams of five students each and the remaining two were added to two of the groups. Each of the group was given a number from 1 to 7, and five cards (A, B, C, D, E f or the MCQ options) to rise simultaneously during the response to group Readiness Assurance Test. There were 10 MCQs used for Readiness Assurance Test which linked to the learning objectives of the session, in addition to the clinical problem application at the end of the session. These were prepared and reviewed by the authors before the session to cover most of the learning objectives. We allowed the students to use their learning resources during group Readiness Assurance Test and application phase but not in individual Readiness Assurance Test to assure individual pre-class preparation. There was no scoring system or peer evaluation applied at this stage. At the end of the two hours session a self-delivered questionnaire consisted of 14 items to evaluate perceptions and attitude of the session were given using a 5-point Likert scale (1 = strongly disagree, 2 = disagree, 3 = neutral, 4= agree, and 5 = strongly agree) and the internal consistency was determined by Cronbach's alpha. In addition, there was free space for the students' comment. Descriptive statistics were

used to analyze the student perception and attitude by using Statistical Package for the Social Sciences (SPSS 20).

Table 1 Frequency (percentage) and Mean score of students responding 1–5 (strongly disagree–strongly agree) to items in the questionnaire (N 37)

No	Item	Response, n (%)					
		Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Mean Score
1	TBL challenged me to me give my best	2 (5.4)	3 (8.1)	10 (27.0)	10 (27.0)	11 (29.7)	3.8
2	TBL session had a positive impact on my learning	3 (8.1)	5 (13.5)	9 (24.3)	11 (29.7)	9 (24.3)	3.5
3	I look forward to attend and learn again in a TBL session	3 (8.1)	3 (8.1)	6 (16.2)	13 (35.1)	10 (27.0)	3.7
4	TBL helped to learn and work in a group	1 (2.7)	0 (0)	2 (5.4)	18 (48.6)	16 (43.2)	4.3
5	discussion during gRAT helped me to understand better	2 (5.4)	2 (5.4)	6 (16.2)	12 (32.4)	15 (40.5)	4.0
6	TBL required more hard work by the students	2 (5.4)	1 (2.7)	0 (0)	15 (40.5)	19 (51.4)	4.3
7	iRAT was good test of my knowledge	1 (2.7)	4 (10.8)	13 (35.1)	10 (27.0)	9 (24.3)	3.7
8	i was able to achieve the learning objectives set through TBL session	2 (5.4)	2 (5.4)	14 (37.8)	10 (27.0)	8 (21.6)	3.6
9	group RAT was useful for applying knowledge	0 (0)	2 (5.4)	15 (40.0)	11 (29.7)	9 (24.3)	3.7
10	TBL promote understanding rather than memorization	1 (2.7)	3 (8.1)	10 (27.0)	12 (32.4)	11 (29.7)	3.8
11	TBL made me apply what i learned through solving problem application	1 (2.7)	0 (0)	10 (27.0)	16 (43.2)	9 (24.3)	3.9
12	TBL session is well organized	2 (5.4)	3 (8.1)	8 (21.6)	14 (37.8)	8 (21.6)	3.6
13	I was satisfied with TBL approach	2 (5.4)	3 (8.1)	12 (32.4)	14 (37.8)	6 (16.2)	3.5
14	The duration of TBL 2 hrs was just right	5 (13.5)	8 (21.6)	6 (16.2)	12 (32.4)	5 (13.5)	3.2

Result

All the 37 students respond to the questionnaire with few comments. Table 1 showed the frequency and the mean response to each of the items. Internal consistency to questionnaire items was 0.931. The positive impact on the students' learning and team working had the highest percentage of 94% and 92% of agreement (agree and strongly agree) respectively. While promoting understanding and achievement of learning objectives had the lowest percentage of 62 and 60% of agreement respectively. Application phase got variable perception (Figure 1) with Sixty nine percent of the students agreed of TBL session helped them to apply what they learned through solving problem application. The majority of the students (66%) accepted TBL session and looking forward to attend it. Many students remained neutral (Table 1) in response to many items, for example out of the 37 students, 13 students were neutral about whether individual Readiness Assurance Test tested their knowledge, and 12 students regarding satisfaction of TBL approach (Figure 2). Forty six percent of the students agreed that the duration of the session was just right.

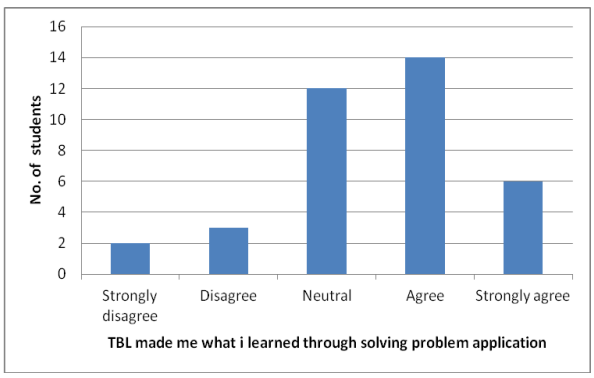

Figure 1: Frequency of students' response to application phase (no.37)

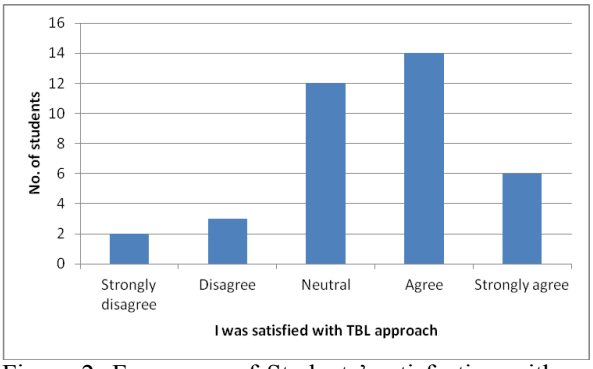

Figure 2: Frequency of Students' satisfaction with TBL session (no.37)

Discussion

To our knowledge this is the first study of TBL to be conducted in Yemen to demonstrate perception and attitude of clerkship students. Our study indicated, TBL was rated positively as learning and enjoyable exercise as it maximized students' engagement during the two hours sessions.

Several students' comments:

> "This is the first time that I didn't go into sleep at this time of the day'
>
> "I like TBL as it gave me immediate feedback on my performance."
>
> "I like group Readiness Assurance Test (RAT) as it helped me to discuss in a friendly atmosphere."
>
> "I wish if this method applied to all lectures."
>
> "I like this method particularly the application section as it links theory with clinical."

Curriculums is a dynamic process, and in medical education the program director and curriculum developer are responsible to make the changes in response to the needs of patients, medical practitioners, society (3, 4), and consistent with Liaison Committee on Medical Education accreditation standards, Tomorrow's Doctors, the World Federation for Medical Education standards in developing the learners' ability to use principles and skills wisely in solving problems of health and disease (6-9). Furthermore, Davis and Harden stated that curricula should be modified and regenerated on a regular basis (5). Having all these into consideration we decided to introduce TBL to clerkship students followed its introduction to undergraduate students at Hadramout University College of Medicine (11).

TBL overcomes many limitations of the other small group instructional strategies. It can be conducted in a single classroom such as lecture theatre to a large number of students with a single instructor (9, 10). It could be implemented in a variety of ways from single session to entire course (12), and in both basic and clinical curricular phase (9, 13-15). In addition to the above advantages, the students receive immediate feedback through the clarification step (2), as well as it encourages attendance as reported by Paul Chad (13).

The limitations of our study were the smaller sample size and no validation of the scale tool where many students remained neutral in response to many items, for example 38% of students remained neutral to whether learning objectives were achieved through the TBL session. Indeed, we could not cover all learning objectives, a statement which was reported by Rebecca J. Sisk who suggested a final wrap-up of core contents by the faculty staff at the end of the session (20). The scale system might be improved by splitting number 3 on Likert scale into two (3a = undecided but leaning towards disagree, and 3b = undecided but leaning towards agree) to increase the chance of obtaining either a positive or negative perception of the activity. Despite the small number of the students, TBL session could be delivered to a wider group of students of more than 100 students as reported by Haidet et al (22). The main strengths of this study TBL were, highly rated of the session as alternative to didactic lecture; willingness of the students to attend such session again; the appreciation and value of the teamwork which supported the findings of previous studies (14-16); the students' agreement (Figure 1) to see how basic and clinical could be integrated; and lastly, it was really a fun to hear the buzz, debate, explanation and conflict among intra- and inter team members which was reported in other studies as well (15, 23) and your intervention and clarification. We think this is climax of the session which would have a lot of advantages such as understanding, long term retention of the subject matter as reported by Koles et al (24), commitment of the group dynamic and its ground roles (1, 21), and allay shyness and afraid of students of speaking and answering wrong question in front of a large audience.

The grading system is the main incentive structure to make the students come prepared for the session (2, 17); unfortunately, such step had

not been adopted in our session because the students had no prior experience with TBL and no allocated reading assignments. We explained the grading system (2) to them and assured their score will improve through group Readiness Assurance Test. Indeed, we have noticed that many students reported more corrected answers in group Readiness Assurance Test compared to individual Readiness Assurance Test. This emphasizes the importance of team working as well as the pre-class preparation. Evidence suggests that students who are not academically successful achieve more in TBL courses as reported by Sisk RJ and Nyindo et al (20, 21). On the other hand TBL has a positive short and long term performance improvement as reported by Warrier et al and Abdelkhaled et al (15, 24). Our concern is that some students may rely on group Readiness Assurance Test and application scores for better score, so we suggest a heavy score to individual Readiness Assurance Test in contrast to the scoring system of TBL (2) so as to ensure the pre-class preparation of all students.

Our student satisfaction's response with the TBL was not very high with only 54%. Contributing factors include no prior exposure to TBL, which could explain the high percentage of neutral response (32.2%), secondly, novel instructional method requires more hard work by students which reported to be 92% in our study and 73% in Oman experience (14). However, studies by Warrier et al (15) and Davidson (25) reported orientation of the students over time would improve acceptance and satisfaction of TBL.

Successful implementation of TBL needs extensive orientation and training of faculty through repeated workshops to gain confidence and become comfortable, leadership support, students' awareness and attention to the scoring grade so as to come prepared and participate in the session effectively, and finally considering the different enabling and inhibiting factors before implementing this strategy (26, 28-30). Our intention to implement TBL gradually through introduction it in other specialty, then after proper students' awareness and faculty workshops we would conduct TBL in one block and the successful implementation will depend on the score comparison of this block with that of previous years. In summary, effective change and shifting of attitudes for both students and faculty requires time and experience.

Conclusion

Our initial experience with team based learning provided additional findings regarding the positive attitude and perception of Team Based learning as alternative to traditional teacher-centered lecture. Our students perceived this strategy as enjoyable, rewarding, helping them to apply knowledge in a teamwork exercise and receiving immediate feedback. It is a feasible, effective and cost effective educational strategy that would be a remedy for many problems such as space and tutor shortage facing the current educational strategies particularly in a country with limited resources.

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