TBL at the Women's Health Internship School - "An Evaluation of student perception”

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Abstract

Introduction: Faced with technological innovation and the change in the learning profile, the use of new teaching methodologies has been increasingly frequent. Team Based Learning (TBL) tool has been used in medical courses in order to improve the motivation, interpersonal communication and critical reasoning in group work. The student perception about these activities is an important parameter of the method effectiveness analysis. The objective was analyze the general perception of last period medical course students of a private university on two thematic modules of the boarding school in women's health performed in the classic TBL format.

Methods: application of a virtual questionnaire one year after the activity.

Results: 92.4% of the participating students remembered TBL activities performed in the previous year. Regarding the physical space and the topics addressed, 96.2% found it adequate and relevant, respectively. 88.5% agreed that the dynamics of the activity contributed to the increased interest in the subjects and 96.2% agreed that the previous study and the multiplechoice tests of individual and group preparation with immediate feedback were important for learning. All students agreed that the relationship with their groups was adequate and that the facilitator teacher contributed to the progress of the activities. There was a perception of improvement in the ability to argue in 84.7% and 96.2% agreed that the activity showed points to be improved individually and in groups. Finally, 76.9% of the participants answered that they would like to participate in other activities in this format during boarding school and 53.9% revealed the preference for the discussion of theoretical themes more actively.

Conclusions: The TBL activity in the women's health internship was well evaluated by the participating students and can contribute to the planning of new thematic modules during this period of the course, aiming at better engagement and student learning.
Keywords: teaching; learning; medical internship

Introduction

Currently, medical courses are considering the incorporation of new technologies and pedagogical tools from the beginning of medical training to specific fields of activity. In view of this, some universities already adopt teaching and learning methodologies that enable pedagogical practice in a more active, participatory and critical-reflexive way, based on experiences considered significant, such as PBL- Problem Based Learning and TBL - Team Based Learning (Bollela et al., 2014).

This need for transformation in health courses aims to break traditional educational paradigms and find measures that move the center of the transmission of teachings by the teacher to the active and participatory learning of the student, with a view to developing good cognitive results and future professional skills. The teacher starts to assume a role of facilitator and the student appropriates co-responsibility in the search for his knowledge (Bollela et al., 2014).

Therefore, in 1970, Larry Michaelsen created a team-based learning method for administration courses, avoiding expository classes and working in small groups, formed by 5 to 7 students, chosen at random, to build concepts and make decisions in a critical and collaborative manner (Bollela et al., 2014).

In Brazil, in 2014, the new National Curricular Guidelines for Undergraduate Medicine courses were published, which recommend the use of active methodologies, which privileges student participation in the construction of learning and integration between the contents of higher education institutions (Oliveira et al., 2018).

Team-based learning differs from traditional teaching methods in which the teacher is the most active element in the process, responsible for exposing and explaining knowledge, while students are merely passive agents in an attempt to acquire learning. With this new method of working in groups, these roles are transformed, since it is necessary for students to seek prior knowledge on the subjects to be addressed in the course subjects, and the teacher becomes a dynamizer and promoter of the educational foundation (Oliveira et al., 2018; Krug et al., 2016).

Team Based Learning is one of the tools that can be used and can be applied to a whole curriculum of a course or used occasionally, in some disciplines or thematic modules, according to the pedagogical political project adopted by each institution (Bollela et al., 2014).

The classic model is structured in a sequence of activities that include three stages. The first is the individual preparation (pre-class), which consists of the previous study of the content proposed by the teachers. The second is the Preparation Guarantee Assessment, which takes place in the classroom by applying a multiple choice test individually (iRAT) and later in groups (gRAT), followed by immediate feedback. Finally, the Application of Concepts, in which the team performs more complex tasks, such as problem solving or decision making in clinical cases proposed by teachers, for example (Bollela et al., 2014; Oliveira et al., 2018).

Currently, it is recommended that at least 20% of the theoretical load be offered at the medical internship, complementing practical training in the various specialties to which students are exposed.

In this context, the benefits of TBL can be diverse, such as greater motivation, accountability and involvement of students with the expected theoretical content and the possibility of improving interpersonal communication and critical thinking through group work. Despite this, there are also some challenges, such as the inadequate preparation
of content by students, the divergence and conflicts between formed groups and the lack of teacher preparation for this type of activity (Krug et al., 2016).

Despite these apparently obvious advantages, there are few evaluations of this type of activity carried out from the students' perspective, especially in the context of medical internship. Thus, the focus of this study was to analyze the student's perception of a TBL activity carried out in two thematic modules at the women's health internship at a private university in the interior of São Paulo.

In view of this, the objective of this work will be to assess the general perception of sixth year medical students from a private college in the interior of São Paulo about the TBL (Team Based Learning) activity carried out in the previous year in two thematic modules of the women's health internship and describe the context and the pedagogical steps of the activities carried out.

**Methods**

**Study design:** This is a descriptive and analytical study.

**Study location:** The study was carried out at a private university in the interior of São Paulo state.

**Inclusion criteria:** The general perceptions of students at the end of the sixth year of a private medical school in the interior of São Paulo were analyzed on the TBL (Team Based Learning) activity carried out at the Women's Health internship stage during the second semester of 2018, through a closed questionnaire, structured on a Likert scale, sent by email (presented in Supplementary File 1).

In this questionnaire, questions were asked about the TBL activity in relation to the topics covered, individual and group participation, advantages and disadvantages that they assessed in this type of pedagogical approach.

The students' participation was voluntary and all those included agreed and signed the free and informed consent term.

The risk for the participants was minimal, involving the discomfort in answering the questionnaire, being mitigated with a detailed explanation of the objectives of the study.

The answers obtained with the questionnaires were compiled in an Excel spreadsheet and the results presented in graphs, tables and analytical reflections.

**Exclusion criteria:** Sixth year students who did not sign the free and informed consent form and / or did not answer the questionnaire were excluded.

**Ethical aspects:** Seeking to ensure the ethical integrity of those involved in the research, the project was submitted to analysis and approval by the Research Ethics Committee of the University of Franca and followed the guidelines and regulatory standards for research involving human beings, established by resolution 466/2012.

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Results/Analysis

The TBL activity was carried out in two thematic modules of the medical internship in women's health: Breast cancer I (risk factors, screening and BIRADS system) and Breast cancer II (diagnosis, treatment and follow-up) in the second half of 2018, with 8 groups of 16 to 18 students each, divided into 4 groups of 4 to 5 students. The classic steps of the tool were followed: 1) prior preparation of the themes, which were made available by the teacher in the week prior to the face-to-face meeting, 2) irAT and gRAT (performance of 10 multiple choice tests individually and in groups, respectively, at the beginning of the face-to-face activity, with immediate feedback and 3) Application of concepts, in which a real clinical case was exposed for resolution in the groups and subsequent discussion to consolidate knowledge.

The pre-prepared questionnaire in the google drive program entitled: "Student evaluation on TBL activity" was sent by email to 67 students, at the end of the last cycle of the sixth year of 2019, an interval of 1 to 1.5 years after their participation in the activity TBL assessed. The submission was made 3 non-consecutive times (December / 2019 to February / 2020), with monthly intervals to provide opportunities for the participation of a greater number of students.

13 statements were prepared for responses in Likert format with the following possibilities from the left to the right of the graphs: 1 - Strongly disagree / 2 - partially disagree / 3 - partially agree / 4 - strongly agree. Their respective results are set out below.

26 responses were obtained after this expected interval (38.8% of the invited students). Participation was spontaneous, with prior signature of the informed consent form.

One year after the completion of the TBL in the two thematic modules of the women's health internship, among the students included in the study, 92.4% answered that they had a clear memory of the activity (partially: 50% and totally: 42.4%); while 7.6% answered that they did not have this clear memory (3.8% partially and 3.8% totally), as shown in Figure 1.

Figure 1: Recall of participation in TBL activity

| I participated in the TBL activity "Breast cancer" held in the 2nd semester 2018 and I have a clear memory |
|---------------------------------------------------------------|
| % of responses   | 1  | 2  | 3  | 4  |
| Total            | 60%| 50,0%| 42,4%|
| 3,8%            | 1  | 2  | 3  | 4  |
| 3,8%            | 1  | 2  | 3  | 4  |
| 50,0%           | 3  | 3  | 4  | 4  |
| 42,4%           | 4  | 4  | 4  | 4  |
When asked about the physical space where the activity was performed, 96.2% agreed that it was adequate (76.9% totally and 19.3% partially) and 3.8% partially disagreed with this adequacy. As for the topics of mastology addressed in the TBL format, 96.2% agreed that they were relevant (84.7% totally and 11.5% partially) and 3.8% partially disagreed, according to Figure 2.

**Figure 2: Relevance of themes addressed**

![Bar chart showing the relevance of themes addressed in mastology](image)

Figure 3 indicates that 88.5% of the students agreed that TBL activities increased their interests and involvement in the subject addressed (50% totally and 38.5% partially) and 11.5% disagreed with this statement, with 7.7% partially and 3.8% totally.

**Figure 3: Interest and student involvement in TBL activity**
When asked about the importance of studies prior to classroom activities, 96.2% agreed that they were essential for participation in the activity (73.1% totally and 23.1% partially) and 3.8% partially disagreed. Regarding the multiple choice tests applied to individual and group preparation with discussion and immediate feedback, 96.2% of the students agreed that they contributed to learning about the subject (57.7% totally and 38.5% partially) and 3.8% partially disagreed. All students (100%) agreed that they had a good relationship with the work group (65.4% totally and 34.6% partially).

When asked whether the TBL activity contributed to improving the ability to argue, 84.7% of the students agreed (38.5% totally and 46.2% partially) and 15.4% disagreed (7.7% partially and 7.7% totally), as shown in Figure 4.

**Figure 4: Influence of activity on the ability to exert**
In addition, 96.2% of the students agreed (57.7% totally and 38.5% partially) and 3.8% partially disagreed that the TBL activity exposed points to be improved in individual studies. When asked if the TBL activity exposes points to be improved in the relationship with the group, 65.4% of the students agreed with the statement (26.9% totally and 38.5% partially) and 34.6% partially disagreed.

All students agreed that the facilitating teacher contributed to the activity developed (92.3% totally and 7.7% partially).

When asked if students would like to participate in other TBL activities at the boarding school, 76.9% agreed (42.3% totally and 34.6% partially) and 23.1% disagreed (15.4% partially and 7.7%) as shown in Figure 5.

Figure 5: TBL activities at boarding school
Discussion

The TBL activity, performed without hospitalization in health by the woman from the medical school in Franca, was positive from the student perspective.

Initially, a relevant point is commented after a low adhesion of the students in the answer to the questionnaire sent, or that may have been influenced by the time elapsed between the activity performed and the questionnaire sent (from 12 to 18 months). However, this interval was proposed in order to analyze the students' memories and the possible pedagogical impact on the activity model abroad, since there was only one of these two modes of use in women's health. Other reasons that allow justifying the non-adherence of other students who suffer from concern and occupation with activities that precede proof of medical residency in that period or even disinterest with the subject addressed in situations.

In spite of this, the authorized responses allow a detailed analysis of the student's view on the TBL activity carried out in the two thematic modules used and, in general, students who respond voluntarily to the questionnaire are more committed to the applied pedagogical activities and the teaching processes - learning.

It is notorious that the physical space to perform a TBL activity must be appropriate and can influence the progress of the activity and interaction between the working groups. In this study, most students (96%) agreed that the location was suitable for the application of the activity. The chairs used, which were not fixed on the floor and in the room, were of considerable size to accommodate the students, enabling the formation of groups and allowing communication between members. Several works are related to small classrooms, with actions that hinder this interaction between students, can generate discomfort and limit the application of this type of active methodology (Parmelee et al., 2012; Rajalingam et al., 2018).

The results obtained showed that the students agreed that the use of this methodology increased interest and involved
subjects, in addition to recognizing that previous studies were essential for the productive participation of individual and group activity. In 2018, Sean Wu also reformulated educators' view of TBL, which appears to develop deep and active student learning, as well as the development of sets of diverse essential skills that are important in their clinical activities (Wu, Farquhar and Compton, 2018); what to reform the student's role as protagonist in the construction of his knowledge, skills and critical sense.

In this study, most students (96.2%) agreed that the multiple choice tests applied at the beginning of the activity and their respective feedbacks contributed to their learning. This data is consistent with another study carried out at the Pontifical Catholic University in 2014 in which 81.6% of the students also found the feedback from the previously answered tests to be of essential importance (Oliveira, 2014).

Thus, it is recognized that one of the main ways of TBL to improve the student's point of view on his work of seeking knowledge and learning is the tool of immediate feedback on the issues discussed in groups. The effect is precocious, the student can identify in which aspect he needs to improve his studies, in order to complete his understanding of the subjects discussed (Burgess, Ayton and Mellis, 2016).

All students who answered the questionnaire reported that they had no problems relating to the working group, in addition to that 84.7% of them stated that the activity contributed to improve their reasoning skills. This data suggests that students committed to learning recognize that as a team they are able to solve highly complex problems, and they can also manage their weaknesses and strengths, reinforcing the study, building a relationship of tolerance, respect for colleagues, collaborative learning and communication effective, as reported by Oliveira (2014).

Most of the students (96.2%) confirmed that the TBL exposed points to be improved in their studies; which suggests that this pedagogical tool also awakens students' responsibility and interest in seeking their knowledge, compatible with that described by Parmelee et al. (2012).

In the survey, more than half of the students (76.9%) agreed with the statement that they would like to participate in other TBL activities at the boarding school. This shows a greater interest in active learning methodologies due to the students' previous experiences, previously exposed to other activities with active methodology (PBL) during graduation.

In view of the questioning about the use of theoretical expository activities, there was a practically equal division in the answers, and still 46.2% of the students reported a preference for expository classes. Several studies differ on what would be the ideal method for an effective teaching-learning process. Wu, Farquhar and Compton (2018) states that 96% of medical educators say that TBL is more effective in retaining knowledge and 25% consider both teaching modalities to be equally good.

In other studies, TBL is considered a more motivating teaching method, as it can awaken in students several skills necessary for their professional future (Wu, Farquhar and Compton, 2018; Pachaly, 2016). Bransford et al. proved that the best learning is that which involves all parts of the brain. For this reason, the TBL would be more advantageous, since it works with the temporal lobe, responsible for long-term memory and the prefrontal lobe, which uses searches for information that are activated during the stages of active education. In contrast to expository classes, these wolves are not stimulated in the same way and do not seem to allow the consolidation of information more efficiently (Alamoudi et al., 2018).

The gains of the TBL method for medical training compared to the traditional method involve the acquisition of
greater knowledge for a longer time. Students recognize that there is an improvement in the ability to work in
groups, to have critical thinking in relation to information, to apply their knowledge in new clinical situations and to
have control of learning, thus generating greater satisfaction and contributing to their relationship with other
professionals and especially the patient (Pachaly, 2016; Emke, Butler and Larsen, 2016; Zgheib et al., 2016).

Among the challenges for the expanded application of TBL are its costs for effective teacher training and
appropriate physical spaces. In addition, the workload of prior student preparation and exposure to peer criticism
and reflections can also cause a negative reaction, especially when the commitment to the activity is not adequate
(Pachaly, 2016; Nyindo et al., 2014).

Finally, according to Pachaly (2016), TBL would be able to develop emotional intelligence in students, which is
important for their future doctor-patient relationship, and this correlates with the domains acquired during medical
training. In addition, with the more frequent use of the method, it helps the student to perceive his own emotions and
recognize those of others, contributing to better teamwork and solving a problem through empathy, an essential
characteristic in the context of medicine (Pachaly, 2016; Emke, Butler and Larsen, 2016).

**Conclusion**

The practice of TBL at the medical internship in women's health at the Faculty of Franca was well evaluated by the
students and may have contributed to the professional training process of the graduates of the course.

**Take Home Messages**

- Students felt stimulated with TBL practice
- TBL contributed to improving the students argumentation capacity
- TBL can contribute to the best of learning during medical internship

**Notes On Contributors**

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Appendices

None.

Declarations

The author has declared that there are no conflicts of interest.

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Ethics Statement

Seeking to ensure the ethical integrity of those involved in the research, the project was submitted to analysis and approval by the Research Ethics Committee of the University of Franca and followed the guidelines and regulatory standards for research involving human beings, established by resolution 466/2012. Approved with CAAE number: 24357619.0.0000.5495.

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