Original Research Article

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MEDICAL STUDENTS PERCEPTION TOWARDS TEAM-BASED LEARNING, UNAIZAH COLLEGE OF MEDICINE, QASSIM UNIVERSITY, KINGDOM OF SAUDI ARABIA, 2020

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ABSTRACT

Background: Team-Based Learning (TBL) is an evidence-based combined learning approach that was developed back in the 1970s, and it has presently become an increasingly used pedagogic method in many educational settings, including medical schools.

Aim of the study: To investigate the perception of medical students towards team-based learning.

Methods: The cross-sectional study was carried out at the Unaizah College of Medicine. Data from the study respondents were collected through a pretested and validated self-administered questionnaire that contained 22 items measuring the different aspects of TBL. Data were analysed using SPSS version 25. The analyses were both descriptive and inferential at the significance level of 0.05 and a confidence interval of 95%.

Results: Girls, on average, tend to agree more than boys that TBL gave them valuable experience. TBL impacts the quality of learning of medical students differently at the various levels of study. students in higher medical education academic levels (MD3 M=2.66, SD=1.41, MD4 M=2.41 SD=1.23) appreciate the TBL method more than students in the lower levels (MD1, M=1.72, SD=0.87, MD2 M=2.03, SD=1.06). Females' students are more likely to get effectively engaged in TBL sessions compared to males (female M=2.05, SD=1.08 versus male M=1.64, SD=0.78).

Conclusion: In conclusion, students in higher medical education academic levels appreciate the TBL method more than students in the lower levels and female students are more likely to become effectively engaged in TBL sessions compared to males.

Keywords: Medical Education, Team-Based Learning, Teaching Strategies, Unaizah College of Medicine

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INTRODUCTION

Team-based learning refers to a well-structured procedure of learning in small-group that emphasizes preparation of learners out of classroom and the application of the understanding gained during the lessons [1].

Health professional programs are currently receiving growing numbers of enrolment. Medical students, however, sometimes feel not adequately prepared to meet societal medical needs [2]. The deficiency has resulted in increased interest in dynamic learning approaches. Instructors desire to engage learners within their classrooms, and thus seek out methods that can enhance information delivery. Various active learning techniques were considered in the last years, including PBL, Problem-based learning, which was the earliest to be employed in health profession education [3].

Presently, higher education facilities are increasingly using Team-based learning (TBL). Whereas conventional lecture-based studies are useful in training learners to remember information, medical students also need critical thinking abilities to apply the knowledge learned in different novel circumstances [4]. As an active training strategy, TBL provides an improved skills application and knowledge retention to learners [5]. Initially, established by Michaelsen, this instructional approach gained momentum and found its way into the medical curricula delivery [6].

TBL in various higher education practices encompasses and inspires active learning periods. Self-engaging instruction improves learner's flexibility and enhances problem-solving capability in diverse conditions [7]. TBL courses at the beginning require a faculty member who are well trained and skilled to facilitate group formation [8]. Mostly a team consists of five to seven learners through a process aimed at evenly distributing specific and practical student skills. The faculty perceives such assets to be suitable for their success alongside the course resources [9].

TBL necessitates that learners get ready for classes by reviewing vital course contents directed by objectives [10].

Implementing TBL requires fundamental practices so that both instructors and learners can benefit. For maximal effectiveness, forming and managing learning groups is vital. The teams must have adequate intellectual resources for the smooth completion of any assigned tasks [11]. The members as well need to interact productively to develop higher levels of problem-solving and critical thinking [12]

TBL classrooms' primary objective during the learning process goes past content dissemination. The approach neither considers ensuring that students focus on practicing and using the concepts for problem-solving [13,14]. The setting of the typical courses entails 5 to 7 units starting with individual assignments for the pre-class [15]. The design of the tasks enables learners to gain an understanding of the previous key concepts. Every unit has an in-class readiness assurance test (RAT), which each student completes at the beginning of each course [16]. Ideally, the critical purpose is to inspire them into studying their pre-class

instructional resources keenly. Learners first complete tests individually, and then retake a similar assessment with the other team members. The remaining TBL unit's class time is dedicated to exercises for applications followed by engagement in group discussions. tRAT enables learners to validate their answers and the later reach a consensus by participating in class discussions [17].

This shift from lecture-focused learning to TBL provides students with the opportunity to receive timely and frequent feedback from every faculty member. In TBL, both teams, and individuals get a response after the completion of a RAP, readiness assurance process [18]. The tRAT and iRAT inputs can also come through an audience feedback system. Generally, the process is instructor-facilitated within the classroom to encourage inter-team dialog [19]. Instructors, in this case, have a little dependence on prepared course materials but rather adapt and transmit feedback as per the wanted learning results. This activity changes the roles of the lecturer from only content delivery purposes to recognizing gaps that challenge students' understanding using follow-up problems [20].

TBL learning tries to strike a balance to these faculty teaching and active learning time-related issues [21]. By breaking up the largest lecture halls of hundreds or even more learners into smaller groups, this approach allows students to learn while requiring only one facilitating faculty actively [22]. There were few studies conducted in Saudi Arabia to explore the students' perception toward TBL. This research study aimed to increase the body of the knowledge in this area and explore the Medical students' perception toward this important instructional method.

METHODS

This cross-sectional study was carried out at the Unizah College of Medicine. All 316 medical students in the college were recruited in this study. Data from this study's respondents was collected via questionnaires containing 22-items measuring the different constructs of TBL. The study was approved by the Research and Ethics board at Unaizah College of Medicine (UCM). Participation in the study was voluntary, but only upon completion of a consent form for each participant. Also, the consent form made it clear that the data would be used for study purposes only, and the data will not be shared with any third parties [10]. Additionally, no distinguishing or identifying information was required from the study respondents.

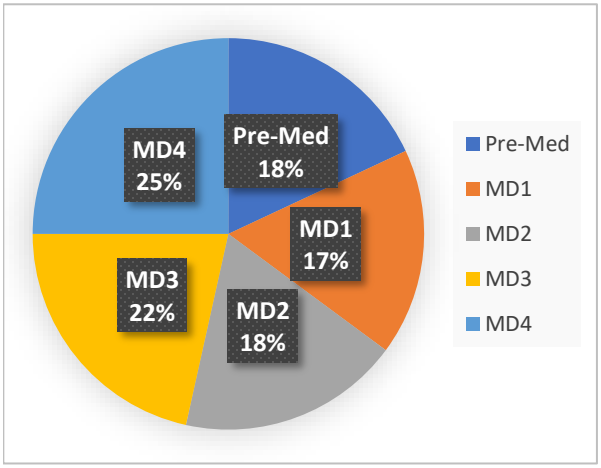
Data were analyzed using SPSS version 25. The analysis involved both descriptive and inferential analyses. The analysis was carried out at a 0.05 level of significance, and confidence interval 95%. The expectation was that attitudes of TBL among students at UCM would be positive with high level of acceptance from the students [22,23].

RESULTS

The final sample consisted of 316 respondents, with 170 females and 146 males. The response rate was 87.7%. They were divided into five groups according to education level, with 18% in pre-med, 17% in MD1, 18% in MD2, 22% in MD3, and 25% in MD4. (Figure 1).

Females on average tended to agree more than males that TBL gave them valuable

Figure 1 Distribution of Students as per their Year of Training



experience M=2.05, SD=1.08 versus male M=1.64, SD=0.78. This was also the case when respondents were asked whether TBL helped improve grades where the average for females was M=2.66, SD=1.27, while that for males was M=2.42, SD=1.16.

Table 1: Descriptive Analysis

Most students, particularly those in the third year of medical school favored TBL more than students at any other level when they were asked whether TBL helped them learn more M=2.66, SD=1.41. However, students in the fourth level of medical school scored highest on average when asked whether TBL has enabled them to work well together M=2.41 SD=1.23. The average Likert score performance for the gender and different levels of education are provided in table 1.

The male and female students' average scores regarding the quality of learning significantly varied, p. value = 0.011. Female students had significantly higher average scores than their male counterparts, as seen in the comparable 95% CI for females of (2.42,

Table 1: Descriptive Analysis

Variable	Mean (SD)	N
Valuable Experience		
Male	1.64(0.78)	146
Female	2.05(1.08)	170
Pre-med	1.60(0.90)	57
MD1	2.22(1.16)	54
MD2	1.72(0.87)	58
MD3[25]	2.03(1.06)	68
MD4	1.76(.77)	79
Work well together		
Male	2.00(1.05)	146
Female	2.46(1.25)	170
Pre-med	1.82(1.14)	57
MD1	2.48(1.18)	54
MD2	2.03(0.90)	58
MD3	2.40(1.29)	68
MD4	2.41(1.23)	79
Helped Learn More		
Male	2.23(1.17)	146
Female	2.57(1.31)	170
Pre-med	2.29(1.25)	57
MD1	2.70(1.28)	54
MD2	2.04(1.04)	58
MD3	2.66(1.41)	68
MD4	2.35(1.19)	79
Improved Grades		
Male	2.42(1.16)	146
Female	2.66(1.27)	170
Pre-med	2.32(1.24)	57
MD1	2.56(1.22)	54
MD2	2.34(1.19)	58
MD3	2.77(1.30)	68
MD4	2.67(1.14)	79
Motivation to Work Harder		
Male	2.12(1.09)	146
Female	2.31(1.21)	170
Pre-med	2.02(1.11)	57
MD1	2.26(1.10)	54
MD2	1.91(0.92)	58
MD3	2.42(1.32)	68
MD4	2.39(1.19)	79
Developed Cooperative Leadership Skills		
Male	1.91(.975)	146
Female	2.12(1.05)	170
Pre-med	1.88(1.09)	57
MD1	2.22(1.22)	54
MD2	1.81(0.93)	58
MD3	2.16(1.02)	68
MD4	2.03(.85)	79

Table 2: T-test Results Across Gender Levels

Variable	95% CI	p-value
Quality of Learning		.011
Female	(2.42,2.75)	
Male	(2.13,2.45)	
Satisfaction with Peer evaluation		.061
Female	(2.18,2.48)	
Male	(1.99,2.27	
Professional Development		.017
Female	(1.96,2.23)	
Male	(1.75,1.99)	
Team Impact on clinical reasoning		.007
Male	(1.95,2.23)	
Female	(1.70,1.96)	

2.75) and males of (2.13, 2.45). However, in terms of satisfaction with peer evaluation, there was no significant difference between the two genders p. value = 0.061. Table 2 gives more detail.

Table 2: T-test results across gender levels

TBL's impact on quality of learning, students in the different levels significantly differed, p. value = 0.028. Post hoc analysis showed that MD1 was significantly higher than MD2 on the quality of learning p. value = 0.018. See appendix table 3.

Table 3: one-way ANOVA across levels of education

There was, however, no significant difference on the level of team-based learning impact on clinical reasoning as p. value > 0.05. MD2 differed significantly with MD3 and MD4 on the satisfaction in peer evaluation as per the post hoc results in table 3 of the appendix.

DISCUSSION AND CONCLUSIONS

Table 3: One-way ANOVA Across Levels of Education

Variable	95% CI	p-value
Impact on Quality		.028
MD1	(2.33,2.89)	
MD2	(1.92,2.38)	
MD3	(2.39,2.94)	
MD4	(2.28,2.72)	
Pre-med	(2.00,2.56)	
Satisfaction in Peer Evaluation		.004
MD1	(1.99,2.57)	
MD2	(1.78,2.18)	
MD3	(2.23,2.74)	
MD4	(2.16,2.55)	
Pre-med	(1.78,2.21)	
Impact on clinical reasoning		0.550
MD1	(1.82,2.37)	
MD2	(1.66,2.03)	
MD3	(1.80,2.24)	
MD4	(1.82,2.19)	
Pre-med	(1.64,2.12)	
Professional Development		.013
MD1	(1.86,2.41)	
MD2	(1.64,1.94)	
MD3	(1.99,2.44)	
MD4	(1.81,2,13)	
Pre-med	(1.61,2.03)	

Data were collected from 316 respondents and then analyzed using a five-point Likert scale to determine the perception of learners on team-based learning. Three was determined as a neutral point and responses higher than three indicating an increasing likelihood to agree. Responses lower than three suggesting a decreasing likelihood to disagree. This method of determining perceptions has been employed in other studies of assessing perceptions including applications in marketing research and other studies evaluating the effectiveness of team-based learning [23,24].

Generally, the study established that female students appreciated the TBL compared to

their male counterparts. Such findings are tallying with findings of the study conducted by Beatty et al. in 2009 which concluded that female students were more responsive to team-based learning [19]. This was true for most of the aspects that were put to question to determine whether team-based learning had a considerable impact on the outcomes achieved in these areas. Differences in the values posted by male and female students were however established not to be statistically significant. Multiple psychology studies have asserted that females tend to be more communicative and share concerns more often than males [5]. Thus, females are more likely to embrace teamwork than males, who are primarily individualistic [5].

Perceptions of premed-level students toward Team-based Learning were rather poor for all the measured aspects. Such findings are reiterated by separate study which determined that students in their earlier years of school have relatively lower amounts of work both in terms of the concept they have to grasp and what is expected of them as learners [25]. Those concepts studied at junior levels are equally easy to grasp and hence individual effort is believed to be enough for academic merit and success. Such findings from these two separate studies explain the poor incorporation of team-based learning among learners in the lower levels of medical school [16].

One-way ANOVA analysis was used to determine the differences between the different levels that stood out the impact of TBL on clinical reasoning. No significant differences existed between how TBL had influenced the actual clinical reasoning capabilities of the learners at different levels [16]. It has been reported that while team-based learning may contribute to the development of clinical reasoning capabilities, the contribution is considerably small. Clinical reasoning is developed as a result of consistent hands-on experience in a practical clinical environment with exposure to different cases under the guidance of an expert in the field [26]. The same results were reported in study exploring the perception of learners toward TBL when it comes to their professional development, and analysis specified that no significant differences existed amongst the different levels. Additionally, professional development is largely determined by the training experience and expertise gained by the individual in the course of their career growth [26].

Significant differences were only recorded in the aspect of satisfaction in peer evaluation and the impact on the quality of their learning processes. Other studies have attributed the effectiveness of peer evaluation on the quality of collaboration between the students in the different teams [27]. Some authors have additionally asserted that teamwork among learners creates an environment of trust and engagement which is imperative in improving the learning process and outcomes [10]. The diversity of these results can be associated with previous studies that have reported that the helpfulness and perceptions of TBL are determined by the diverse personalities of the different learners and their respective individual characteristics [26]. The effectiveness of peer evaluation has been a subject of research with existing literature proving insufficient and inconclusive [25]. On average, learners in MD3 were more receptive towards this yet to

be executed team-based learning approach as results of that cohort stood out for the variables measured and compared at the level of academic education [28]. Their perception is perhaps shaped by the experiences they have gained in medical school over the years and the need to create, an engaging and collaborative environment that facilitates critical thinking [9]. One study has suggested that as students progress to higher levels in the academic ladder, there is a drastic change in perception as they focus more on joining the workplace which usually presents a dynamic set of challenges to the learner [29]. This phenomenon could be further associated with how the faculties administer the course as evidence has suggested that team-based learning is more effective for courses with particular features [25].

Studies have revealed that courses in higher classes in medical school are more technical, requiring collaboration rather than individual brilliance [30]. This assertion is, however, subject to further research to test the correlation between course characteristics as well as the effectiveness of the TBL strategy. Notably, findings from the study lacked consistency in terms of the various perceptions of team-based learning on influencing the expected outcomes of a medical course [31]. This finding supports the findings of earlier studies that have established the perceptions and outcomes of team-based learning are largely influenced by the individual characteristics of learners [32]. MD3 and MD4 students showed the highest scores of the different items of the Questionnaire. At this level, especially for the students in MD3, there is a lot to cover within a short time. Hence, engaging in team learning with their peers makes grasping of concepts easier. It also gives them different perspectives, which allows them to cover more content faster compared to working alone [33]. Additionally, students at these two levels are in their final step of becoming professionals [34]. MD3 was the level where most of the questionnaire items had the highest average scores suggesting that at this level, students are laying down the platform for teamwork, which they might be needed in their MD4 and as future professionals [35]. These assertions are supported by some other studies which have established a link between teamwork activities and the development of both soft and procedural skills required for success at the workplace [36].

CONCLUSION

Team-based learning creates an environment that fosters collaboration, teamwork, critical thinking, problem solving skills, and engagement. It not only develops students' technical capacities but also their soft transferable skills, such as effective communication, interpersonal skills, and organizational skills. Further, this study revealed that students in the higher medical education academic levels appreciate the TBL method more than students in the lower level. Moreover, it has asserted that female medical students are more likely to get engaged in TBL compared to males. This study provides the framework for further research in the area of team-based learning, particularly identifying the explanation behind the perception of male and female students.

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