SHORT REPORT

Perceptions regarding team-based learning among undergraduate physical therapy students

Muhammad Furqan Yaqoob, Zara Khalid, Muhammad Ehab Azim, Sana Ahsan, Muhammad Furqan Hassan, Aamer Naeem

Abstract

Team-based learning (TBL) is a strategy where teams work together to develop concepts and apply them towards problem-solving. This latest learning approach has not been tried in the educational environment of Rehabilitation Sciences. Hence, this study aimed to assess the knowledge and practices regarding TBL among undergraduate physical therapy students. A descriptive cross sectional survey was conducted involving 222 undergraduate physical therapy students who were selected via non-probability convenience sampling from Foundation University Institute of Rehabilitation Sciences over a period of three months (May 2018 - July 2018). Data was collected using questionnaire in the light of literature review, developed by Wright States University's Department of Communication based on the Minnesota satisfaction questionnaire. It contained questions regarding knowledge, practices and satisfaction with team-based learning, assessed via 19 statements on 5-point Likert scale. The sample consisted of 208 (93.7%) females and 14 (6.3%) males with mean age of 20.07±1.18 years. Regarding familiarity with TBL, 189 (85.1 %) students had understanding of TBL. 182 (82%) participants had practiced team-based learning whereas 40 (18%) had never practiced TBL in their lives. Majority of the students agreed on the positive effects of TBL on quality of learning, clinical reasoning abilities and professional development (median=4.00). TBL could be a highly useful, active learning strategy inculcating multiple skills among undergraduate students and should be introduced as supplementary to traditional lecture-based teaching.

Keywords: Attitudes, Knowledge, Practice, Students, Team based learning.

DOI: https://doi.org/10.47391/JPMA.1172

Introduction

"Learning style" is defined as the various unique methods adopted by students to learn and recall the information effectively. As per the educational theorists, there is a strong link between examination success, clinical experience and learning styles.[1] It is indeed a challenge for the instructors to cover the extensive curriculum and impart the large volume of knowledge in the limited time in such a way that it is retained effectively by the students. This has led to changes in the teaching and learning styles, with a predominant shift from the didactic, instructor-centred to interactive, active, student-centred style of learning.[2]

One such instructive strategy that assists in active learning is Team-based Learning (TBL). It was introduced in the late 1970s by Dr Larry Michaelson for business education, but has lately been adopted by health sector professional education too.[3] Team-based learning consists of the following chief components: a) Advanced/ pre-class preparation: students are instructed about the material which they are expected to study before coming to the class; b) Team formation: multiple teams of five to seven students are formed by the instructor; c) Readiness assurance: assurance to apply the learned concepts by solving an MCQ test; d) Group application: a set of tough MCQs is given to all the teams, followed by open discussion within the class; e) Peer evaluation: evaluation of each team member by the students, for their efforts and contribution to problem-solving and team work. Thus, TBL involves a sequential process of pre-class activities, individual effort and team work within the class, followed by instant feedback on their performance, providing a motivational framework.[4]

Use of TBL in health education leads to better retention of knowledge and enhanced problem-solving abilities among students.[5] According to literature, the perceptions of students as regards TBL are positive as it provides a higher degree of satisfaction, especially for academically weak students.[6] Although team-based learning is now being implemented all over the world in health profession studies, literature still lacks information concerning practices of TBL in the educational environment of rehabilitation sciences in Pakistan. Hence, this study was conducted to assess the knowledge and practices regarding team-based learning in

Foundation University Institute of Rehabilitation Sciences, Foundation University, Islamabad, Pakistan.

Correspondence: Muhammad Furqan Yaqoob. Email: mfurqan_pt@yahoo.com

undergraduate physical therapy students.

Patients/Methods and Results

A descriptive cross-sectional study was conducted on 222 undergraduate physical therapy students at the Foundation University Institute of Rehabilitation Sciences, Islamabad. The sample group was selected on the basis of inclusion and exclusion criteria and the sampling technique employed was non-probability convenience sampling. Only full time undergraduate physical therapy students were included, whereas postgraduate physical therapy students and students of other departments were excluded from the study. This study was conducted over the duration of three months (May 2018 - July 2018). Prior to the initiation of the study, due ethical approval was obtained by the ethical review committee of the Foundation University, Islamabad. Informed consent was taken from the participating individuals and confidentiality was ensured. Data was collected using questionnaire in the light of literature review developed by Wright States University's Department of Communication based on the Minnesota Satisfaction Questionnaire. It contained questions regarding knowledge, practices and satisfaction with team-based learning. These domains were assessed via 19 statements evaluating Overall satisfaction with Team Experience, Team Impact on Quality of Leaning, Satisfaction with Peer Evaluation, Team Impact on Clinical Reasoning Ability and Professional Development on 5-point Likert scale ranging from Strongly Disagree-1, Disagree-2, Uncertain-3, Agree-4 and Strongly Agree-5. Aggregate scores for each category were calculated by averaging the means for all the items in a particular category.[7] Data was entered and analysed on SPSS v. 21.0. Descriptive statistics were applied to determine the frequencies and percentages of individual responses on all questions. Measures of central tendency (median & mode) and variability (interquartile range IQR) were reported as average measures for the five subscales of questionnaire.

The sample consisted of 222 physical therapy students including 208 (93.7%) females and 14 (6.3%) males with mean age of 20.07±1.18 years. Regarding familiarity with team-based learning, 203 (91.4%) students had heard of such a term, whereas 19 (8.6%) had never heard of this term. A total of 189 (85.1 %) students had understanding of TBL,182 (82%) participants had at some point in time practiced team-based learning whereas 40 (18%) had never practiced TBL in their lives. The preference of number of fellows/team members in a group varied with 82 (36.9%) students preferring four team members, followed by 53 (23.9%) students who preferred five

Table-1: Students responses on knowledge, practices and satisfaction regarding team-based learning.

Sr. No	Questions	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
Overall satisfaction with team experience						
1.	Do you think working in team is a valuable experience?	0.9%	6.3%	5.9%	54.5%	32.4%
2.	Do you think that the other team members and you have equally contributed?	4.1%	9.5%	17.1%	53.2%	16.2%
3.	Do you think the team has worked well together?	1.4%	3.6%	14.9%	55.0%	25.2%
4.	Do you think that the other team members have respect for you?	1.4%	1.4%	13.1%	59.0%	25.2%
5.	Do you think team work is a productive use of course time?	0.5%	1.8%	9.5%	50.0%	38.3%
Impact of team on Quality of learning						
6.	Do you think the team helped you to understand course material more than studying alone?	1.8%	6.8%	5.9%	42.8%	42.8%
7.	Do you think that when you are in team you have learned a lot?	0.9%	3.2%	6.8%	49.1%	40.1%
8.	Do you think that being part of team helps you to improve your grades?	1.8%	5.9%	13.5%	48.7%	30.2%
Compliance with PEER Evaluation						
9.	Do you think your peers are fair to judge your contribution in a team?	1.4%	9.9%	27.9%	54.1%	6.8%
10.	Do you think peer evaluation motivates you to work harder?	1.8%	6.8%	9.0%	60.8%	21.6%
11.	Do you think peer evaluation motivates you to work more collaboratively?	1.4%	5.4%	10.4%	63.1%	19.8%
12.	Do you think you like the use of peer evaluation as a part of your team?	1.8%	7.7%	20.3%	54.5%	15.8%
Impact of team on clinical reasoning ability						
13.	Do you think being a team member has helped you to become better problem solver?	0.9%	1.8%	7.2%	55.0%	35.1%
14.	Do you think team makes good decision?	2.7%	4.1%	19.8%	50.0%	27.9%
15.	Do you think team discussion has improved your ability to solve problem?	0.9%	3.6%	6.3%	55.9%	33.3%
Professional development						
16.	Do you think it helps you to develop skills to work with others?	0.9%	0.5%	4.5%	47.8%	46.4%
17.	Do you think it helps you to develop cooperative leadership skills?	0.0%	4.1%	7.2%	46.4%	42.3%
18.	Do you think it helps you to develop more respect for the opinions of others?	0.9%	2.3%	4.1%	55.4%	37.4%
19.	Do you think it helps you to enhance the sense of who you are?	2.3%	2.3%	9.5%	52.7%	33.3%

members in a group. Majority of the sample, 151 (68.1%), reported the preferred duration of a team-based activity to be 1-2 hours.

Cronbach's alpha of 0.738-0.819 in all subscales demonstrated satisfactory internal consistency of all subscales evaluating different domains of team work. The percentages of individuals' responses in all questions of each category are elaborated in Table-1.

◆ Overall satisfaction with team experience: An observation of overall mean scores for the statements in this category suggested that the study participants were "uncertain" regarding their satisfaction levels with team experience (mode=3, median=3.36, IQR=0)

◆ Impact of team on quality of learning: Overall mean scores for the statements in this subscale indicated that the study participants "agreed" that the presence of a team helped them to understand course material better, enhanced learning and improved their grades (mode= 4, median= 4.33, IQR= 1)

◆ Compliance with peer evaluation: Mean scores in this category demonstrated that majority of the students "agreed" and complied to peer evaluation as part of the team and helped in motivation to work harder within a team (mode=4, median= 4.00, IQR=1)

◆ Impact of team on clinical reasoning ability: Overall mean scores for statements in this subscale showed that the study participants "agreed" that working in a team had positive impacts on their problem solving and decision making abilities (mode=4, median= 4.00, IQR=1)

◆ Professional development: Observation of mean scores in this category depicted that majority of the participants "agreed" that working in a team helps in professional development by expanding the cooperative leadership skills and developing respect for everyone's opinions within a team (mode=4, median= 4.25, IQR=1)

Discussion

Team-based learning has been advocated as the latest and more effective education technique, but not commonly practiced in rehabilitation sciences. In the current study, we found that most of the participants were familiar with the concept of team-based learning. Regarding overall satisfaction with the team experience, it was observed that most of the students were either not very clear or were satisfied with working in a team, considering it a valuable and productive use of their time. These results support the results of a similar study by Beven et al, on physical therapy students' perceptions of TBL in gross anatomy according to which the DPT students assessed their experience with TBL to be quite positive in terms of satisfaction and preference for mode of learning.[8]

As for the quality of learning, the perception of most of the students was that being in a team had always helped them understand the course contents better and improve their grades. Similar results were observed by Dhiren Punja et al, who applied TBL to first-year medical students and found that participation in team-based learning significantly improved the exam scores and enhanced their mastery over the contents as compared to non-TBL group.[9] However, in contrast, there was no significant difference in exam scores and grades observed between TBL and non-TBL groups in a study by Malone et al.[10] The difference might be due to the vast variety of subjects and mode of learning in different fields of study such as use of recall questions in exam or application of practical knowledge.[11]

An additional component of working and learning within a team during TBL is peer evaluation. In the current study, maximum number of students believed that peer evaluation is justified as a source of motivation and hard work for all the team members, in turn promoting active learning. A study by Rachel E. Stein et al also found that TBL increased accountability as this element required the students to assess and rank their team members' performance along with rationale. It also leads to enhanced learning at individual level as now the students are bound to prepare for the upcoming class otherwise it would affect the whole team's performance.[12]

A vast majority of students in our study agreed or strongly agreed that clinical reasoning and problem-solving abilities are greatly improved by working in a team. Similar results were shown by Deardorff AS et al in their study with 84% of their students agreeing or strongly agreeing to the higher impact of TBL on problem-solving and critical reasoning skills as compared to other teaching methods.[13] Professional development comprising multiple attributes is also thought to have improved after learning in a team environment. This holds true not just at undergraduate but at postgraduate level as well. A study by Judy Currey et al on critical care nurses depicted that after practicing TBL, the postgraduate students perceived their professional development and growth to be accelerated.[14] Thus, team based learning could function as a very effective teaching and learning tool for uplifting the skills and other attributes of students.

Conclusion

Based on the results of this study on physical therapy students' positive attitudes, knowledge and practices

regarding team-based learning, it is concluded that TBL could be highly useful, active learning strategy inculcating multiple skills among undergraduate students such as enhanced learning, problem-solving, clinical reasoning, motivation, team spirit, cooperative leadership skills and professional development. Hence, it should be introduced in undergraduate physical therapy curriculum supplementary to traditional lecture-based teaching.

Disclaimer: None to declare.

Conflict of Interest: None to declare.

Funding Disclosure: None to declare.

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