

# Effects of community-oriented education using team-based learning on students' motivation to practice community health care

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## Abstract

**Objectives:** The aim of this study was to investigate changes in health university students' attitudes toward community service before and after a community-oriented education program using team-based learning (TBL).

**Methods:** A community-oriented educational program using TBL was carried out with a total of 529 3rd- and 4th-year students in seven faculties of two departments at Fujita Health University, and a questionnaire survey was conducted before and after the program. There were eight questions on students' attitude toward community service.

**Results:** Responses with no missing information from 431 students were used in the analysis. There were significant increases in the number of positive responses to three questions after TBL. The item "I think there are things that university students can do as members of the community" increased from 81.9% before TBL to 86.5% after, "I can form specific images of activities that benefit the community" increased from 46.0% before to 70.3% after, and "In the future I want to participate in activities that benefit the community" increased from 74.7% before to 80.3% after.

**Conclusion:** The results suggest that this community-oriented educational program using TBL raised the motivation of university students in medical and health science programs to practice community health care.

**Keywords:** Community-oriented education, Team-based learning, Public health, Interprofessional education

## Introduction

As Japan faces major social changes including the rapid aging of society and a declining birthrate, there is concern about weakening ties in local communities,<sup>1</sup> and efforts centered on local governments have been undertaken to resolve issues faced by individual communities and revitalize them.<sup>2</sup> Universities are also seen as a valuable local resource, and university operations and education with ties to the local community are seen as important.<sup>3</sup>

Fujita Health University is a comprehensive health university with two departments and seven faculties: the Faculty of Medicine in the School of Medicine, and the Faculty of Medical Technology, Faculty of Nursing, Faculty of Rehabilitation, Faculty of Clinical Engineering, Faculty of Radiological Technology, and Faculty of Medical Management and Information Science in the School of Health Sciences.<sup>4</sup> Seeking ways to coordinate its operations with the community, the University has concluded a general agreement with the city of Toyoake, Aichi Prefecture, where it is located, and begun partnership activities to enhance community public health and welfare.

For students to carry out community service activities, they need to understand community needs and create and implement activities that respond to those needs. It is therefore necessary to cultivate students' ability to see the current situation and

issues in a community and create methods to resolve them. From a practical standpoint, however, with a limited teaching staff, it is difficult to implement educational programs for activities in partnership with people in the community. Moreover, there are few reports on efforts by students from all school departments.

Since its establishment in 1971, our university has provided an original, university-wide class subject called "Assembly." In this lesson, all 1st- and 2nd-year students in all schools and faculties are divided into teams regardless of faculty, and together undertake activities with teaching staff. The aim is to develop a foundation for team medicine. Since 2013, a new Assembly lesson has been added for 3rd-year and higher students in all schools and departments, in which interprofessional education preparatory training is carried out. The aim is for students to experience going beyond departmental barriers to uncover and find solutions to patients' health problems so that they will see the importance of this approach. In this class, adopting the technique of team-based learning (TBL),<sup>5</sup> teams made up of students from different faculties are formed and work to resolve a given problem.<sup>6</sup> Additionally, utilizing the ties between the university and community, community residents' health problems have been adopted as topics since 2015. Community-oriented learning has been introduced in which students propose specific measures to resolve issues from the perspective of what students can do as members of the community.

In this study, we investigated the changes in attitudes toward community service of university students studying medical and health science before and after implementation of a community-oriented educational program using TBL.

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## Methods

### Subjects

The city of Toyoake, Aichi Prefecture, where the university is located, was chosen as the target area because it was thought to be a place that all students had experienced. Toyoake is a city with a population of about 68,000 located on the east edge of the major city of Nagoya, and has developed as a bedroom community of the Nagoya metropolitan area.

A total of 529 students from the two schools and seven faculties of Fujita Health University participated, including all 3rd-year students from the Faculty of Medicine in the School of Medicine and the Faculties of Nursing, Clinical Engineering, and Radiological Technology of the School of Health Sciences, some 4th-year students from the Faculty of Rehabilitation and all 4th-year students from the Faculties of Medical Technology and Medical Management and Information Science in the School of Health Sciences. All TBL students were subjects for the analysis except those who missed classes on the days the Assembly lessons were held.

### Community-oriented education using TBL

Assembly lessons were held for 4 hours on June 10, 2015 (TBL Day 1), 4 hours on June 19 (TBL Day 2), and 3 hours on June 26 (general presentation meeting). TBL was used as the educational method.<sup>7</sup> There were 5–6 people on each team, and a total of 89 teams were formed. The teams were composed so that students from the seven faculties of both schools were mixed together. The teams were separated into five classrooms and TBL was conducted simultaneously. Two or three teachers were in charge of the operations in each classroom. The question “What can I do as a member of the community to promote health among community residents?” was the theme. An Assembly committee selected from teaching staff from all departments refined and prepared the teaching materials.

An orientation class was held 1 week before TBL Day 1 in

each faculty. So that students would understand the current situation and issues in Toyoake, a Municipal Health Promotion Plan made for Toyoake residents<sup>8</sup> was distributed to students beforehand and they were encouraged to study it. Teaching staff selected from all faculties prepared problems that would be interesting for students from all faculties. Opinions were sought from all faculty members participating in the class, and the teaching materials were repeatedly refined and then finalized.

TBL Day 1 consisted of a readiness assurance process with an individual readiness assessment test, a team readiness assessment test, and application activities. The Day 1 applied tasks were to “Understand the current situation and issues in Toyoake” and “Think, as a team, of measures to resolve the issues in Toyoake.”

On TBL Day 2, application activities and peer evaluation were conducted. The peer evaluations were returned to the students after several days. The application activities on Day 2 were to plan measures to resolve the issues in Toyoake and to diagram the plan on paper and give a presentation. Finally, an outstanding plan was selected by student votes in each classroom.

A general conference was held in a large hall with a capacity of 2,000 people, with presentations of outstanding plans from a total of 11 teams selected from the individual classrooms. The Mayor of Toyoake, the head of the Toyoake health promotion department that created the Municipal Health Promotion Plan, five public health nurses, and about 15 Toyoake residents also attended.

On TBL Day 2, a learning task in which students made posters with specific ideas and gave presentations on them was incorporated in the TBL, based on the premise that it was part of an actual program to resolve health issues in community residents.

Table 1. Changes in students' attitudes to community service before and after TBL

n=431(%)

Questions	Before TBL	1: Strongly disagree	2: Disagree	3: Somewhat disagree	4: Somewhat agree	5: Agree	6: Strongly agree	Significant difference
	After TBL							
1. I think it is important to do things that are beneficial for the community	Before TBL	3(0.7)	6(1.4)	26(6.0)	133(30.9)	187(43.4)	76(17.6)	0.007
	After TBL	2(0.5)	5(1.2)	33(7.7)	156(36.2)	171(39.7)	64(14.8)	
2. I think there are things that university students can do as members of the community	Before TBL	6(1.4)	14(3.2)	58(13.5)	167(38.7)	146(33.9)	40(9.3)	0.017
	After TBL	4(0.9)	7(1.6)	47(10.9)	168(39.0)	163(37.8)	42(9.7)	
3. I think it is important to understand the people living in a community in order to conduct activities that benefit the community	Before TBL	3(0.7)	6(1.4)	23(5.3)	160(37.1)	175(40.6)	64(14.8)	0.651
	After TBL	2(0.5)	9(2.1)	23(5.3)	156(36.2)	185(42.9)	56(13.0)	
4. I think it is important to understand the current situation in a community in order to conduct activities that benefit the community	Before TBL	3(0.7)	6(1.4)	19(4.4)	155(36.0)	181(42.0)	67(15.5)	0.723
	After TBL	1(0.2)	6(1.4)	20(4.6)	151(35.0)	184(42.7)	69(16.0)	
5. I think it is important to identify issues in a community in order to conduct activities that benefit the community	Before TBL	3(0.7)	5(1.2)	23(5.3)	161(37.4)	173(40.1)	66(15.3)	0.916
	After TBL	1(0.2)	7(1.6)	20(4.6)	157(36.4)	184(42.7)	62(14.4)	
6. I think it is important to use all of the abilities I have acquired to resolve issues in the community	Before TBL	4(0.9)	6(1.4)	32(7.4)	161(37.4)	171(39.7)	57(13.2)	0.487
	After TBL	1(0.2)	7(1.6)	27(6.3)	158(36.7)	186(43.2)	52(12.1)	
7. I can form specific images of activities that benefit the community	Before TBL	23(5.3)	50(11.6)	160(37.1)	119(27.6)	58(13.5)	21(4.9)	<0.001
	After TBL	9(2.1)	20(4.6)	99(23.0)	163(37.8)	111(25.8)	29(6.7)	
8. In the future I want to participate in activities that benefit the community	Before TBL	16(3.7)	11(2.6)	82(19.0)	184(42.7)	103(23.9)	35(8.1)	0.007
	After TBL	7(1.6)	16(3.7)	62(14.4)	179(41.5)	133(30.9)	34(7.9)	

Wilcoxon's signed rank test with paired samples

### Questionnaire survey

The questionnaire was based on those used in previous studies<sup>9,10</sup> and created with content matching the aims of this study and, specifically, implementing TBL as a form of community-oriented learning. During preparation, the questionnaire was examined by three specialists in medicine and healthcare education and checked by the Assembly committee before being finalized. The survey consisted of the same questions before and after TBL. There were eight questions on students' values with regard to community service, the importance of understanding the community, and changes in motivation to practice community health care.

The eight questions are shown in Table 1. The responses were scored on a 6-point Likert scale of "1: Strongly disagree," "2: Disagree," "3: Somewhat disagree," "4: Somewhat agree," "5: Agree," and "6: Strongly agree."

approved by the Medical Research Ethics Committee of Fujita Health University (Approval no.: 13-209).

### Results

The questionnaire was distributed to all 529 TBL participants before TBL and was collected from all 529 participants (100% response rate). For the post-TBL survey, the questionnaire was distributed to 515 participants on TBL Day 2 and responses were received from 450 (response rate 87.4%). Of these, 19 were excluded for incomplete responses and the analysis was done with the remaining 431 participants (valid response rate 95.8%). The respondents comprised 184 males and 247 females. Their ages and university departments are shown in Table 2.

#### Changes in attitude to community service

Table 2. Basic attributes

		n=431(%)	
Sex	Male	184	42.7%
	Female	247	57.3%
Age	Mean ± SD	21.4 ± 2.1	
	(range)	(20-33)	
School and Faculty	School of Medicine		
	Faculty of Medicine, 3rd year	107	
	School of Health Sciences		
	Faculty of Medical Technology, 4th year	84	
	Faculty of Nursing, 3rd year	78	
	Faculty of Radiological Technology, 3rd year	48	
	Faculty of Rehabilitation, 3rd year	41	
	Faculty of Clinical Engineering, 3rd year	43	
	Faculty of Medical Management and Information Science, 4th year	30	

There was an orientation before the TBL and the questionnaire was given at the end of TBL Day 2.

### Statistical analysis

The subjects for analysis were limited to those who completed the questionnaires both before and after TBL.

The number of responses by level and the percentage for each of the eight questions were analyzed. The total percentages for the responses "4. Somewhat agree," "5. Agree," and "6: Strongly agree" were aggregated as responses showing a positive attitude. To compare before and after TBL, statistical analysis was done with Wilcoxon's signed-rank test with paired samples in a non-parametric test of the scores before TBL and at the end of Day 2. The statistical software SPSS Statistics Ver. 23 (IBM Corporation) was used with statistical significance set as <0.05.

### Ethical considerations

To participate in the questionnaire survey that was done for the study, subjects were given an explanation in writing of the study's purpose, methods, and content. It was explained to students that participation in the study was voluntary, that they would suffer no disadvantage whatsoever by refusing to participate, and that they could withdraw at any time even after giving consent to participate in the study. This study was

The results for students' values with respect to community service, importance of understanding the community, and changes in motivation to practice community health care before and after community-oriented learning with TBL are shown in Table 1. The positive response rate to three items increased significantly after TBL, and the positive response rate to one item decreased significantly. The percentage of subjects who responded positively to "2. I think there are things that university students can do as members of the community" was 81.9% before TBL, and increased to 86.5% after TBL. The percentage of positive responses to "7. I can form specific images of activities that benefit the community," was 46.0% before TBL, and increased dramatically to 70.3% after TBL. Before TBL, 74.7% responded positively to "8. In the future I want to participate in activities that benefit the community" and this increased to 80.3% after TBL. However, the percentage of positive responses to "1. I think it is important to do things that benefit the community," which was 91.9% before TBL, decreased to 90.7% after TBL. The scores for responses to the statement "It is important to do things that benefit the community" significantly decreased after TBL. The number of subjects giving negative responses of "1: Strongly disagree," "2. Disagree," and "3. Somewhat disagree" increased slightly from 35 to 40 subjects. The positive responses to "4. Somewhat agree" increased from 133 to 156 subjects,

while the positive responses to “5: Agree” and “6: Strongly agree” decreased from 187 to 171 participants and 76 to 64 participants, respectively.

## Discussion

With regard to the motivation to practice community health care after TBL, the dramatic increase in positive responses to “7. I can form specific images of activities that benefit the community,” and “8. In the future I want to participate in activities that benefit the community” seem to indicate that the motivation to practice community health care increased after TBL. Thus, thinking specifically about the question “what activities can I do to resolve health issues of community residents?” in both the advance learning and team learning sessions is thought to have enhanced students’ ability to imagine specific activities. This clearer image of activities is thus thought to have increased students’ motivation to practice community health care.

With regard to questions measuring the level of understanding of the community, there was no significant difference in the responses to “3. Importance of understanding community residents,” “4. Importance of understanding the current community situation,” “5. Importance of discovering community issues,” and “6. Importance of resolving community issues with the use of my own abilities” before and after TBL. It is suspected that the lack of significant changes in the responses to these questions after TBL was a result of the fact that the 3rd- and 4th-year students who were the subjects of this study had learned considerable content related to community health and health care in other classes and already had an understanding of their importance before participating in TBL.

The significant decrease in the scores for responses to the statement “It is important to do things that benefit the community” may have been a result of the change in the motivation of students who held a positive view of community service from the beginning. Although students may have held community service in high regard before TBL, they may have had only a vague grasp of what benefit to the community actually meant. After TBL, their thinking about community service may have become more practical, and led to reconsideration of their own activities. It thus seems that for students, examining what is beneficial for the community was an opportunity to think about the meaning and value of community service.

The educational technique of TBL is spreading rapidly in the field of medical professional education.<sup>5</sup> The effectiveness of TBL derives from strong cohesion and developed trust among learning team members.<sup>7</sup> This is also useful in the practice of interprofessional education. The healthy exchange of opinions in TBL, in which one listens to the ideas of others and others listen to one’s own ideas, is also helpful<sup>11</sup> and is thought to be effective in the practice of community-oriented learning. In our program, much time is devoted to communication among students in the form of exchanges of ideas within teams, presentations, and question-and-answer sessions in the classroom. This is thought to have resulted in active expression of opinions within teams, stronger teamwork in the investigation process, a better understanding of the current situation and issues in the local city, and a deepened interest in the community. The students in this study from multiple disciplines gained a greater understanding of local issues by exchanging and sharing opinions and addressing

issues regarding community service activities as a team. Based on this interaction and the findings above, we believe that the understanding the students gained about their community from the advance learning, together with the sharing of knowledge and interaction led to a heightened interest in matters affecting the community.

Opportunities for active participation by students and incorporation of an incentive structure for a sense of accomplishment are important in TBL.<sup>11</sup> The cooperative work of students in preparing the posters provided the students an experience of accomplishment, and is thought to have been effective in raising their motivation to practice community health care.

In the future, we hope to provide students with opportunities to put their ideas into practice. In Western countries, there are reports of efforts to incorporate service-learning into population health education curricula for medical university students.<sup>12,13</sup> While the composition of those curricula varies, many include community assessments. Issues in the community are ascertained and activities to promote health are undertaken in coordination with the community. Students at our university who participated in TBL gained knowledge on health in the community and an understanding of social resources, and learned the importance of assessing community needs. As a next step, students will create multiple programs for community residents in cooperation with the local government using what they learned in TBL, for which we will need to structure educational activities to be implemented in the community.

The findings of the present study suggest that community-oriented learning using TBL increased the motivation to practice community health care in university students of medical and health science.

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## Conflict of Interest

The authors have no conflicts of interest to disclose.

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