Mixed-Method Outcome Evaluation of a Community-Based Education Program for Medical Students

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Background: Although community-based training is included in medical undergraduate education in Japan, little assessment of the outcomes of community-based education programs has been performed. The aim of this study was to investigate the outcomes of a community-based education program using a mixed method.

Methods: The study design utilized both qualitative and quantitative methods (mixed method). The subjects (n = 278) were fifth-grade medical students who were involved in the program from 2008 to 2010 inclusive. We collected two types of data: a six-item pre-and-post questionnaire (quantitative) and an open-ended questionnaire (qualitative) to evaluate the impressions this experience left on the students.

Results: Pre-and-post questionnaires were completed by 263 (95%) of 278 subjects; on all items, the scores of the post-data were significantly higher than that of pre-data (P < 0.001). From the responses given by 139 respondents (total 181, 77%) in the open-ended questionnaire survey, 10 themes were extracted: 1. Inter-professional cooperation; 2. Role and cooperation among university hospitals, community hospitals, clinics, and welfare facilities; 3. Patient-centered medicine; 4. Trust-based relationships; 5. Competency in general medicine; 6. Professionalism; 7. Medical management; 8. Communication; 9. Common diseases; and 10. Long-term care.

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Conclusions: We found that medical students gained four major perspectives from their experiences: Inter-professional cooperation, trust based relationships, roles of community hospitals and clinics, and patient-centered medicine, respectively. Our findings suggest this program contributed significantly to their understanding of community medicine.

Keywords: community-based medical education, evaluation, mixed method

BACKGROUND
There is a worldwide trend toward the reform of medical education and clinical training, and one of the key recommendations is to increase students’ orientation toward primary health care. The Alma-Ata Declaration on Primary Health Care in 1978 suggested that the concept of primary health care was the key strategy to achieving health for all. This declaration means that the development of primary health care plays an important role in health promotion around the world. In addition, the 34th World Health Organization Assembly in 1981 suggested the adoption of a global strategy for reorientation of national health systems based on primary health care. Furthermore, it acknowledged the need for appropriate training of health personnel so that they are prepared for the tasks they will have to perform. This is now one of the key agendas in medical education worldwide.

Influenced by this trend, community-based education is now incorporated in the model core curriculum in Japan. In addition, because the collapse of community medicine has become a serious problem in Japan, community-based training is currently emphasized in medical undergraduate education. In 2010, the Japan Society for Medical Education announced a proposal for improving community-based education. This proposal described that community-based education should be promoted by medical schools and communities, and medical students should be motivated to contribute to community medicine and community-based education, which offers good opportunities for medical students to learn professionalism. Therefore, future expansion of community-based education is expected in Japanese medical undergraduate education.

However, relatively few reports have documented the outcomes of community-based education programs. It is unknown whether the numbers of medical students interested in primary health care, the goal of the Alma-Ata Declaration, has increased. In a literature review, we found that most studies had used either the qualitative or quantitative method. However, recently the use of mixed-method research has increased in the field of health sciences. Mixed-method research is defined as a combination of qualitative and quantitative methods conducted by a researcher or research team for the broad purpose of gaining a complete understanding or corroboration within a single study or closely related studies, and is designed to paint a more comprehensive picture than any single method. Because few mixed-method studies have investigated the outcomes of community-based education programs, we used this mixed-method to investigate what medical students had learned from a community-based education program.

METHODS
Setting and subjects
This mixed-method study design utilized both qualitative and quantitative data with the aim of achieving convergent validity, which is known as cross-method triangulation. The study subjects included 278 fifth grade medical students, who were involved in the program from 2008 to 2010, inclusive. The Department of General Medicine, Faculty of Medicine, Saga University, has been organizing community-based education programs for fifth grade medical students since 1998. The purpose of this program is to have medical students gain an understanding of community medicine. It involves groups of between 10 to 13 medical students on a rotating schedule (one week in a clinic followed by a second week in a community-based hospital). In 2008, six clinics and seven community hospitals participated in this program which increased to nine clinics and eight community hospitals in 2009, respectively. Initially, staff of the Department of General Medicine outlined
the goals of the program to the students. After the first week, the staff asked for the students’ views on the program up to that point, in addition to their goals for the following week. After the second week, the group members discussed with the staff what they had learned. This program primarily included the observation of a variety of clinical practices, such as outpatient practice, inpatient management and house visits. In addition, in some clinics, some of medical students had an opportunity to take patients’ histories.

Data collection
We collected two types of data: a pre-and-post questionnaire (quantitative) and an open-ended questionnaire (qualitative).

- Pre-and-post questionnaire
We delivered pre- and post-self-evaluation questionnaires before and after the two-week program, respectively. The questionnaires were developed referring to the model curriculum of the Liaison Council of Primary care Education11 (Table 1).

- Open-ended questionnaire
In 2009 and 2010, after the two-week program, the open-ended questionnaire was given to the students. We asked only one question: “What aspect of this program impressed you the most?”

Data analysis
- Pre-and-post questionnaire
To investigate changes in the students’ perception, we compared the pre- and post-evaluation questionnaires by the Wilcoxon signed-rank test. Data was analyzed with PASW Statistics 18 for Windows (SPSS Inc., Chicago, IL, USA).

<table>
<thead>
<tr>
<th>Items</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I can describe the roles of family doctors.</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>2. I can describe the differences of encountered diseases and clinical problems between those in clinics and those in university hospitals.</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>3. I can describe the importance to make problem-lists regarding diseases and people.</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>4. I can explain the need to solve problems by respecting the patients’ values and their families’ thoughts.</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>5. I can describe how feature of communities influence the patients’ diseases and patients’ behavior and course of practice.</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>6. I can describe the importance of cooperation between clinics and university hospitals.</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

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- Open-ended questionnaire
Qualitative thematic analysis was utilized. Identifiers and names were removed from the descriptions.12 The first and second authors independently read and coded all transcripts, and then discussed, identified, and agreed on the coding of the descriptors.

This study was approved by the Institutional Review Board of Faculty of Medicine, Saga University. Data were accessible only to the researchers and individual respondents.

RESULTS
Of the 278 students, 263 students (95%) completed the pre-and-post questionnaires. From 181 respondents, 139 responses were collected (77%) in the open-ended questionnaire survey.

Characteristics of respondents who returned the pre-and-post questionnaire are shown in Table 2.

Pre-and-post questionnaire
On all items, the degrees of post data were significantly greater than that of the pre data ($P < 0.001$) (Figures 1–6).
Table 2. Characteristics of respondents who returned the pre-and-post questionnaire

<table>
<thead>
<tr>
<th>Year</th>
<th>Number (Male:Female)</th>
<th>Mean Age (Range)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>97 (55:42)</td>
<td>24 (23–44)</td>
</tr>
<tr>
<td>2009</td>
<td>90 (42:48)</td>
<td>24 (23–30)</td>
</tr>
<tr>
<td>2010</td>
<td>91 (47:44)</td>
<td>24 (23–45)</td>
</tr>
<tr>
<td>Total</td>
<td>278 (144:134)</td>
<td>24 (23–45)</td>
</tr>
</tbody>
</table>

Open-ended questionnaire

From the 139 respondents, 163 factors were extracted and categorized into 10 themes, as follows (number of factors in parentheses).

1. Inter-professional cooperation (39)
2. Roles of and cooperation among university hospitals, community hospitals, clinics, and welfare facilities (29)
3. Patient-centered medicine (23)
4. Trust-based relationships (22)
5. Competency in general medicine (14)
6. Professionalism (11)
7. Medical management (11)
8. Communication (5)
9. Common diseases (5)
10. Long-term care (4)

Examples of responses are given within quotation marks.

1. Inter-professional cooperation

   Many medical students recognized the importance of relationships between doctors and co-medical staff when interacting with patients. “It was very impressive that doctors, nurses, care workers, physical therapists, occupational therapists, and speech–language–hearing therapists were all involved in treating the same patients.”

2. Roles and cooperation among university hospitals, community hospitals, clinics, and welfare facilities

   Some students appreciated that the roles of community hospitals and clinics differed from those of university hospitals. In addition, they were aware of the importance of cooperation among university hospitals, community hospitals, clinics, and welfare facilities.

   “I discovered the roles of clinics, community hospitals, and university hospitals and how they cooperated with each other. I believe that all such types of facilities are necessary to practice community based medicine.”
3. Patient-centered medicine

Some students recognized that patients live in communities; therefore, they described the medical treatment considering their needs and backgrounds.

“Doctors need to consider not only treatments but also the patients’ values. In addition, we should consider how terminal-care patients spend their final days. I was given a good opportunity to experience comprehensive care.”

“I learned that doctors form close relationships with patients because they need to consider the patients’ needs and living environments.”

4. Trust-based relationships

Some students perceived the importance of trust-based relationships not only between doctors and patients but also among health care facilities to provide patients with primary care.

“… I really realized the importance of trust-based relationships between doctors and patients because if such relationships were to be destroyed, patients would not tell the doctors their symptoms or ask questions. A trust-based relationship contributes to the patient’s treatment.”

“I strongly recognized that several clinics and community hospitals cooperated for the benefit of the patients. I felt that a trusting relationship among health care facilities is very important.”

5. Competency in general medicine

Some students described the importance of a wide range of clinical competencies.

“Within the limitations of the available equipment, the doctors must diagnose diseases and judge what to do next.”

“Doctors in clinics have made an effort to learn the discipline of medicine so that they can treat patients with a variety of symptoms. I understood the requirements placed on family doctors.”

6. Professionalism

Some medical students were impressed by the doctors who devoted themselves to patient care.

“Enthusiasm of the doctor was the most impressive aspect for me. He visited his patients’ homes and applied the best practice.”

7. Management in medicine

A few students saw the influence on practice of medical management first hand.
“Because the Japanese economic condition is severe, I now understand the difficulties involved in medical management. Purchasing medical equipment appeared problematic.”

8. Communication
A few students learned that effective communication between doctors and patients and between doctors and co-medical workers is essential in the field of health care.
“Communication with patients was impressive, especially verbally. Although it is certain that history-taking is useful in making a diagnosis, I think that good communication often leads to successful treatment.”

9. Common diseases
Some students realized that clinics dealt with a wider spectrum of diseases compared with large university hospitals.
“There were many patients with chronic diseases, fever, or abdominal pain, etc., compared with the university hospital.”

10. Long-term care
Some students recognized the importance of long-term care because many patients had chronic diseases.
“I realized how important it is to consult a doctor regularly and to reduce the patients’ waiting time.”

DISCUSSION
The aim of this mixed-method study was to investigate what medical students had learned from a community-based education program. The results showed a marked difference between pre- and post-questionnaire responses, and 10 themes were identified regarding the issues that impressed the students the most. Four major themes were identified from the analysis of pre-and-post and the open-ended questionnaires.

1. Inter-professional cooperation
As students seemed to understand that patients have many types of health problems and that patients’ needs should be respected judging from the results of Items 3 and 4, we believe that the students fully recognized that the presence of doctors alone is inadequate in the clinical workplaces and that inter-professional cooperation is also required to deal with the patients’ needs. It has been reported that medical students perceive the needs of inter-professional cooperation in community medicine. Our findings indicate that medical students realized the importance of inter-professional cooperation over any existing workplace culture. From the analysis of the open-ended questionnaire, it was assumed that the reasons why the students recognized this were as follows: 1) the close relationship between doctors and patients and 2) relatively small organization of community hospitals and clinics. Although much attention has been paid to inter-professional education in medical education, there are relatively few reports of inter-professional education in the community-based setting. Our findings will encourage the contribution of community-based medical education in inter-professional education.

2. Trust-based relationships
The fourth theme has been reported in other countries besides Japan. Furthermore, the eighth theme seemed to support this theme because communication is essential to establish trust-based relationships. It is thought that community-based education programs provide medical students with circumstances where they become fully aware of the importance of trust-based relationships between doctors and patients from the result of Item 4, and among health care facilities from the result of Item 6, regardless of any difference in culture and health care delivery systems. The factors contributing to understanding of this theme warrant further studies, such as cross-cultural studies.

3. Roles of community hospitals and clinics
Through Item 1 and the second theme, we can assume that in this program, medical students discovered the roles of community hospitals and clinics. We realize that one facility alone cannot satisfy the patients’ needs because of the diversity of those needs (Item 3), the health care systems (Item 6), and a variety of common and chronic diseases (Item 2; 5th, 9th, and 10th themes). Although one Japanese study reported...
that students are able to understand the importance of cooperation among health care facilities, our findings revealed that they understood that each university hospital, community hospital, or clinic has an important role and that one institute cannot be considered to be of paramount importance through the results of Item 1, 2, and 6 and the second theme. Furthermore, we anticipate that this community-based education program will increase the learners’ awareness of the fact that “relationships with others” is important in clinical medicine. In addition, they recognized that trust was established as an essential component in developing relationships among facilities. Further studies are required to investigate why and how students realize this and which components of this program contribute to their learning.

4. Patient-centered medicine
From the third theme, the students seemed to learn the meaning of patient-centered medicine. Students realized that the patients’ values should be respected in clinical practice. Subsequently, the medical students seemed to perceive that two important aspects of patient-centered medicine are to 1) respect the patients’ values and their families’ (results of Item 4), and 2) to consider the influence of the community that patients live in (results of Item 5). From the fourth theme, students seemed to realize that patient-centered medicine is based on a trust relationship between doctors and patients. This theme has also reported by several previous studies. Miyata et al performed a study using significant event analysis to examine what medical students had learned from a two-week attachment in community medicine. They reported that students gave their impressions of the medical system, the role of physicians, patient-centered care, role models, and clinical ethics, and the impressions of most students were in the form of comments and generalizations. Howe asserted that the rationale behind community-oriented medical education is a more patient-oriented perspective. Our findings are consistent with these studies.

Further studies are required to investigate how students perceive patient-centered medicine with regard to trust-based relationships and what factors contribute to their understanding.

The use of both quantitative and qualitative methods provided us with a comprehensive picture of the students’ views. Other programs or sessions could also be evaluated using this mixed method in the field of medical education.

Our findings provide us with evidence that this type of community-based education program is effective in terms of understanding community medicine. Our findings also support the belief that this program is consistent with the concept of primary health care in achieving the “Health For All” goal. However, it is unknown whether the behavior of medical students who participated in this program was changed. In terms of Kirkpatrick’s learning evaluation model, the design of this study is on the appropriate level of evaluation of learning. Future research should focus on the objective evaluation of the learners’ behavior to objectively evaluate the outcomes of community-based education in the long term.

Limitations
This study has two main limitations. First, as only one university runs this program, it is unknown whether the results could be generalized, and cross-sectional studies would be required to confirm this generalization. Second, because this survey was not conducted anonymously, the results may have intrinsic bias.

CONCLUSION
We evaluated the outcomes of a community-based education program using a mixed method. Our findings suggest this program contributes to a better understanding of community medicine by the medical students. Further research is required to study the outcomes of community-based education.

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Conflict of interest
There is no conflict of interest with regard to this study.

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