



## Original article

# Comparison of attitudes toward community-based medicine between regional-quota and general-selected medical student in Japan

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## Abstract

**Objective:** This study compared the regional-quota and general-selected medical students' understanding, interest, and confidence in the community medicine practice and their attitudes toward the concept guidelines.

**Methods:** We conducted a Web-based questionnaire survey regarding the understanding, interest, and confidence in future community medicine practice and attitudes toward concept guidelines among medical students of all grades (regional-quota and general-selected: n=82 and n=617, respectively).

**Results:** The overall response rates were 68.5% (56/82) and 66.0% (409/617) in the regional-quota and general-selected groups, respectively. Although there was no significant difference between the groups in terms of understanding ( $P=0.998$ ), interest and confidence in future practice were significantly higher in the regional-quota group (both  $P<0.001$ ). There was no significant difference between the two groups for any of the six questions regarding community medicine guidelines.

**Conclusion:** The understanding of community medicine or its conceptual guidelines did not significantly differ between the two groups; however, interest and confidence in future practice were significantly higher in the regional-quota group. These results suggest that the regional-quota system positively upregulates the interest in community medicine, which could be associated with confidence in future practice. Comprehensive and longitudinal improvements in the regional-quota system may be effective in cultivating community medicine.

**Key words:** questionnaire survey, community medicine, regional-quota, medical student

(J Rural Med 2024; 19(1): 10–16)

## Introduction

Worldwide, healthcare is shifting from conventional medical care to community-based integrated care, which supports patients in the community<sup>1,2</sup>. Hence, the center of medical treatment is shifting from hospitals to communities. As the proportion of older adult patients with multimorbidity or chronic diseases is increasing globally, rel-

evant medical and healthcare approaches are warranted. These social contexts demand nurturing healthcare professionals with insights into community medicine, defined as the integration of health services and social welfare care in the community<sup>3,4</sup>.

Furthermore, the uneven distribution of physicians is a serious global problem. The World Health Organization (WHO) published global policy recommendations regarding access to health workers<sup>5</sup>. With changes in the medical system, medical education should also modify and cultivate doctors who can respond accordingly<sup>6</sup>.

To address this issue, the Japanese government implemented a regional-quota system (chiikiwaku)<sup>7</sup>. It allowed medical students to receive prior benefits, such as special entrance qualifications and scholarships, on the condition that they would work in a specified rural medical institution for a certain period of time after graduation and practice community medicine. To ensure the availability of doctors in the community, most medical schools include regional-

Received: June 26, 2023

Accepted: August 3, 2023

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quotas.

Studies have explored attitudes toward community medicine in medical student and trainee doctors<sup>8,9</sup>. However, no previous study has compared the confidence or attitude differences between regional-quota and general-selected medical students before graduation in medical students.

Therefore, we evaluated the attitude toward community medicine among Japanese medical students. We administered a questionnaire to medical students from all grades and compared the future institute or region where they wanted to work, and the attitude toward community medicine between the regional-quota and general-selected groups.

## Methods

### Ethical considerations

This study was approved by the Research Ethics Committee of the Faculty of Medicine, Kagawa University (No. 2023-013). Verbal informed consent was obtained from students by the medical teacher and clerks also handled the pre-survey process. All students were informed about the nature and purpose of the study and their anonymity was guaranteed. Students were also informed that they could withdraw from the study if they notified the investigator within a week after they responded to the survey. We also emphasized that withdrawing from the study would not impact their academic outcomes. The study sample included medical students in Japan aged >18 years<sup>10,11</sup>.

### Questionnaire survey development and study measures

We conducted a Web-based questionnaire survey regarding medical students' attitudes toward future workplaces or disciplines that they hoped for, and their understand-

ing, interest, and confidence in future community medicine practice. Our medical school comprised 82 regional-quota medical students (regional group) and 617 general students (general group).

Table 1 presents the questionnaire's contents. In theme 1, we asked the students regarding the future institutes or regions where they wanted to work. We clarified that regional-quota medical students could name the institutes or regions after their postgraduate mandatory period in the Kagawa Prefecture. In theme 2, their understanding, interest, and confidence in future community medicine practice were evaluated. We developed three questions based on the concept of outcome-based medical education or entrustable professional activity<sup>12,13</sup>. In theme 3, we evaluated their attitudes toward community medicine's concept guidelines from the Japanese Ministry of Health, Labour and Welfare<sup>14</sup>. Responses in themes 2 and 3 were rated on a 5-point Likert scale that ranged from 5=strongly agree to 1=strongly disagree. The questionnaire contents were evaluated by three medical education professionals. A pilot test was conducted by four medical clerks at our medical education center. The online survey was conducted in Japanese using the Google Form™ (Google LLC, Mountain View, CA, USA) over a 40-day period from April 27 to May 31, 2023.

### Regional-quota selection in entrance examination in the Kagawa University

The Kagawa Prefecture is located northeast of the Shikoku region. Takamatsu is the capital and largest city of the Kagawa Prefecture; other major cities include Marugame or Mitoyo. This prefecture has a population of 950,000 and is the smallest prefecture by geographic area, at 1,877 square kilometers. Medical care is relatively good because of road maintenance and emergency-care development.

**Table 1** Web-based questionnaire

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Theme 1. Basic questions
(a) Type of medical institute you want to work in the future.
(b) Regions where you want to work in the future.
Theme 2. Attitudes of medical students on understanding, interest, and confidence for future community medicine practice (5=Strongly agree, 4=Agree, 3=Somewhat agree, 2=Disagree, 1=Strongly disagree).
Q1: Do you have sufficient understanding of community medicine?
Q2: Do you have sufficient interest in community medicine?
Q3: Do you have confidence in providing future medical practices in community medicine?
Theme 3. Attitude toward community medicine concept guideline (5=Strongly agree, 4=Agree, 3=Somewhat agree, 2=Disagree, 1=Strongly disagree).
Q1: The community medicine policy classifies hospitals into four patterns: advanced acute, acute, convalescent, and chronic phases.
Q2: The central committee calculates the necessary number of beds for the four classified phases.
Q3: The central committee promotes the classification and adjustment of the number of hospital bed according to each medical care zone.
Q4: The central committee resolves various problems in the community according to the regional conditions.
Q5: Community medicine policies can contribute to the sustainability of medicine in each medical care zone.
Q6: Community medicine policy can contribute to the streamlining of medicine in each medical care zone.

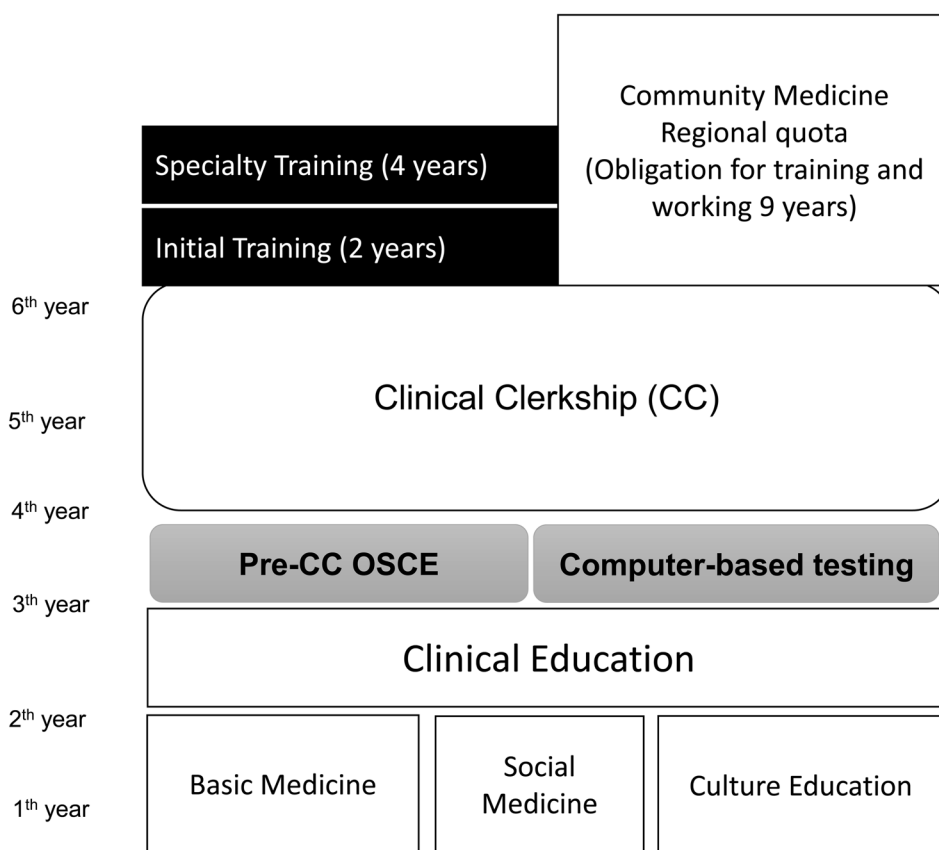
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As for the selection of regional-quota medical students, graduation from high schools in the Kagawa Prefecture is a prerequisite. Our university provides two patterns for the medical entrance examination. One is a written test, the same as for general-selected candidates. Another is a recommendation by a specific high school in the Kagawa Prefecture and interview by our medical school. Graduation from a high school in the Kagawa Prefecture is not essential for general selection. Approximately 70% of our medical school students are from outside the Kagawa Prefecture, that is, general-selected candidates.

After admission, they receive a scholarship (approximately \$900/month) from the Kagawa Prefectural Government, which is responsible for securing medical care in the prefecture's rural areas. After graduation, all regional-quota candidates—they comprise approximately 10% of all Kagawa University medical students—are obligated to work for nine years in rural medical institutions assigned by the prefectural government. This system is common in Japan, with minor variation from university to university. The regional-quota system in our university is only for the Kagawa Prefecture.

## Medical education curriculum and career map in the Kagawa University

Figure 1 shows a conventional career map for Japanese medical doctors and the duties of the regional-quota candidates, which can also be applied to our medical school. Japanese medical schools have a six-year study program. Students enter medical schools after graduating from high schools and clearing an entrance exam. As with other medical schools in Japan, medical students at the Kagawa University complete all basic and clinical medicine lectures and skill training before they begin clinical clerkship in the latter part of their fourth grade. After graduation, a few students do not major in clinical medicine and opt for basic research or social medicine. We give all medical students lectures on community medicine from the 1st year onward and students undergo at least two weeks of community hospital training during the latter part of clinical clerkship. Although specific medical teachers take care of regional-quota students, we do not conduct any specific formal lecture for these students. Medical teachers for community medicine regularly conduct informal seminars and mentoring sessions for regional-quota medical students.



**Figure 1** Career timeline and obligated working period of regional-quota candidates in our (Kagawa) university.

## Statistical analyses

Statistical analyses were performed using JMP Pro version 13.2.1 (SAS Institute Inc., Cary, NC, USA)<sup>14</sup>. Results were compared using a chi-squared test. Data were presented as mean ± SD. Statistical significance was set as  $P < 0.05$ .

## Patient and public involvement

Neither the participants nor the general public were involved in the design, execution, reporting, or dissemination of the study.

## Results

Table 2 presents the number of responses from each grade and response rate. The overall response rates were 68.5% (56/82) and 66.0% (409/617) in regional-quota and general-selected groups, respectively.

Figure 2 shows the workplace or region where the students wanted to major. Over 75% students in both the groups

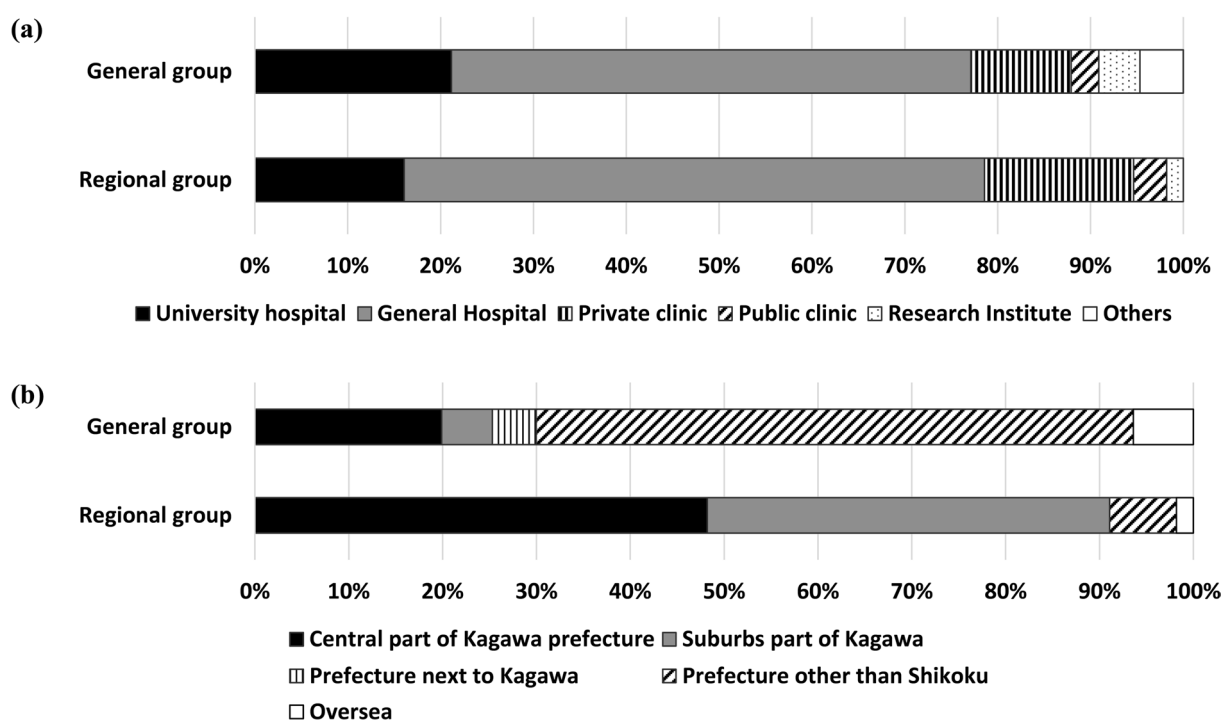
wanted to work in a university or general hospital. Regarding the region, most students in the regional-quota group desired working in the Kagawa Prefecture, whereas only 25% showed this preference in the general-selected group.

Table 3 shows students' understanding, interest, and confidence in future community medicine. Although there was no significant difference in understanding community medicine between the two groups ( $P = 0.998$ ), interest and confidence in future practice were significantly higher in the regional-quota group compared to the general-selected group (both  $P < 0.001$ ).

Table 4 shows their attitudes toward community medicine guidelines. The attitudes did not significantly differ between the groups on any of the six points. Additionally, we compared the attitude between regional and general groups in each grade, but the tendency remained the same in the whole year analysis.

**Table 2** Background information

	Regional group N=82 (1st /2nd /3rd /4th /5th /6th Grade)	General group N=617 (1st /2nd /3rd /4th /5th /6th Grade)
Number of medical students	15/18/13/10/13/13	97/111/107/97/99/106
Number of respondents	13/10/10/8/5/10	94/66/72/57/61/59
Total response rate (%)	68.3 (56/82)	66.0 (409/617)



**Figure 2** Desire for (a) workplace and (b) region in the regional-quota (R group) and general-selected (G group) medical students.

**Table 3** Attitude of medical students regarding the understanding, interest, and confidence in community medicine practice (5=Strongly agree, 4=Agree, 3=Somewhat agree, 2=Disagree, 1=Strongly disagree)

	Regional group	General group	<i>P</i> -value
Q1: Understanding	1/26/21/8/0	14/131/141/111/10	0.998
Q2: Interest	18/31/5/2/0	26/190/107/55/28	<0.001*
Q3: Confidence	14/35/6/1/0	27/189/149/29/14	<0.001*

**Table 4** Attitude toward community medicine concept guideline (5=Strongly agree, 4=Agree, 3=Somewhat agree, 2=Disagree, 1=Strongly disagree)

	Regional group (Grades)	General group (Grades)	<i>P</i> -value
Q1	6/21/28/1/1	37/143/216/10/2	0.801
Q2	7/25/22/1/1	44/142/205/10/3	0.499
Q3	8/25/20/1/2	41/150/204/7/4	0.180
Q4	10/22/22/1/1	44/154/196/8/4	0.518
Q5	9/23/21/2/1	45/147/201/9/3	0.429
Q6	10/23/20/1/2	46/150/191/14/6	0.286

## Discussion

Community medicine refers to a care approach wherein communities comprehensively address the healthcare requirements of citizens and collaborate with external medical institutes for this purpose<sup>15</sup>. Older adults lose access to medical care because of their loss of mobility, especially in rural areas with minimal public transportation<sup>16</sup>. Hence, comprehensive care is crucial in enabling them access healthcare and maintain their health<sup>17</sup>. Furthermore, for effective and comprehensive care, medical trainees should be educated, including on the perspectives of citizens.

Community-based medical education is a practical method to teach trainees about primary healthcare and care in medical institutions outside medical and tertiary hospitals<sup>18</sup>. It is especially significant in the contexts of aging societies. Thus, medical students and resident doctors can acquire practical knowledge, expertise, and relevant attitudes regarding clinical reasoning, inter-profession collaboration, and community medicine not taught in medical universities<sup>19</sup>. Medical education can actively involve citizens within communities to teach comprehensive care to medical trainees. When administering comprehensive care, trainees must deal with various health problems experienced by older people<sup>20</sup>, which can lead to frailty, requiring management through multi-disciplinary community collaboration<sup>21</sup>. Citizens can modify the process of managing their health problems, and this can be learned through participation. Aging societies require medical trainees who understand comprehensive care<sup>22, 23</sup>.

In our study, although the understanding of community

medicine or its guidelines did not differ between the groups, interest and confidence in future practice was significantly higher in the regional group than in the general group. As our university provided only regular mentoring and not a specific class for regional-quota students, the difference could be attributed to their self-awareness of being selected as regional-quota students. Another possibility can be attributed to the regional-quota entrance examination<sup>24</sup>. Deep consideration and thinking on community medicine during entrance examination preparation may have become a seed of awareness toward community medicine.

To further cultivate motivation toward community medicine in regional-quota students, some regular training or lectures on community medicine may be effective<sup>25</sup>. For example, career design and lifelong learning training for regional-quota medical students may induce awareness toward community medicine.

This study has several limitations. First, as the data were obtained from a single institution, our findings may not be generalizable. A nation-wide attitude survey regarding community medicine and comparison between regional-quota and general-selected groups are required in the future. Second, the definition of community medicine in this study was relatively narrow. As the term community medicine includes both primary care provided mainly at clinics and small or medium-sized hospitals and supporting medical care in a certain municipality, including large hospitals, concise explanation of the definition might be effective. Third, we conducted only a quantitative analysis using a Likert scale on the awareness of or attitudes toward community medicine. Hence, performing quantitative analyses, such as interviews or a text-mining analysis, is warranted<sup>26</sup>. Fourth, we included both sexes in this analysis. A sex difference analysis in the context of medical practice or training environments may be of interest<sup>27</sup>.

Nevertheless, the present results suggest that the regional-quota system positively upregulates interest in community medicine, which could be associated with confidence in future practice. To promote the regional-quota system, facilitating active learning regarding the future possibilities may be effective<sup>28, 29</sup>. Simulation-based future career design can generate concrete images of students' future in community medicine.

## Conclusion

This study conducted an attitude survey regarding community medicine among Japanese medical students. Comparison of the regional and general groups revealed little difference between the two groups in terms of understanding of community medicine or its guideline. However, interest and confidence in future practice was significantly higher in the regional group. These results suggest that the regional-quota system positively upregulates interest in community medicine, which could be associated with confidence in future practices. Comprehensive and longitudinal improvements in the regional-quota system may be effective in cultivating community medicine.

**Conflict of interest:** The authors have no affiliation with any manufacturer of any device described in the manuscript and declare no financial interest in relation to the material described in the manuscript.

**Funding:** The work was supported by the Establishing Bases for Fostering Medical Personnel in the Post-COVID Era Project by Japanese Ministry of Education, Culture, Sports, Science and Technology.

**Ethics approval and consent to participate:** This study was approved by the Research Ethics Committee of the Faculty of Medicine, Kagawa University (No. 2023-013).

**Data availability statement:** Data can be provided upon reasonable request.

**Author contributions:** N.K. performed the study, statistical analysis, and wrote the manuscript; M.Y. prepared the manuscript, provided critical comments, and approved the final version. All authors have read and approved the manuscript's final version.

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