




## PRELIMINARY REPORT

# Investigating the perceptions of career development as the Japanese regional quota medical students and graduates in A prefecture

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## Abstract

**Background:** There are few reports about the perceptions of the regional quota called *Chiikiwaku* medical students and graduates.

**Method:** Eighty-four medical students and 41 graduates were enrolled in A prefecture. The questionnaire comprised 22 items scored on a 7-point Likert scale, focusing on perceptions of merit and demerit of *Chiikiwaku*. The data were collected online.

**Results:** *Chiikiwaku* students scored higher on an item such as 'regional quotas are a solution to the doctor shortage'. *Chiikiwaku* graduates felt more burdened than *Chiikiwaku* students.

**Conclusion:** Our results suggested that the perception of *Chiikiwaku* was different between *Chiikiwaku* students and graduates.

## KEYWORDS

*Chiikiwaku*, community medicine, development of *Chiikiwaku* questionnaire, Japanese regional quota system, perception of *Chiikiwaku*

## 1 | BACKGROUND

The urban–rural inequity of physician distribution still exists across Japan.<sup>1</sup> Thus, since 2008, Japan has executed an original regional quota system named *Chiikiwaku* for medical schools that requires doctors to work for a certain period in the future in areas with physician shortages.<sup>2</sup> *Chiikiwaku* system varies by university and municipality regarding available scholarships and obligation years.

In A prefecture, scholarships are available, and obligation period is 9 years. *Chiikiwaku* students in many of universities and municipalities are required to work in doctor shortage areas for nine mandatory years; however, if they are unable to work at the expected hospitals, they have to leave *Chiikiwaku* and refund their scholarships, including interests. Despite positive reports that *Chiikiwaku* physicians are working as expected in physician shortage areas,<sup>3</sup> there are concerns that these physicians are not functioning in actual clinical

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practice as expected, with long duty periods, disengagement from the system, and increasing vacancy rates in *Chiikiwaku* programme in medical schools.<sup>4</sup>

In Japan, the issue of *Chiikiwaku* doctors leaving their obligations before the end of their mandate has been raised,<sup>5</sup> and a national survey of *Chiikiwaku* students regarding their obligations and leaving is currently being conducted.<sup>6,7</sup> The need for career support has also been acknowledged, as many of those who leave cite a mismatch in their preferred career path. Prefectures are supposed to formulate career development programmes based on the issues discussed at the regional medical countermeasures council to 'secure doctors in doctor shortage areas' and 'ensure opportunities for developing and improving the skills of doctors dispatched to doctor shortage areas'.<sup>8</sup>

In response to those needs, career development programmes have become available in all 47 prefectures, but it is unclear how *Chiikiwaku* students and graduates perceive this system. This pilot study aimed to investigate the perceptions of *Chiikiwaku* students and graduates regarding their career development.

## 2 | METHODS

### 2.1 | Questionnaire

Since there is no reliable questionnaire that focuses on the perception of *Chiikiwaku* regarding career development, we developed a questionnaire focusing on the career development-related advantages and disadvantages of being a *Chiikiwaku* doctor. The original version of the questionnaire had 22 items scored on a 7-point scale, with '1' indicating a response of 'I do not think so at all' and '7' indicating a response of 'I strongly think so' in Japanese, referring to the 'National Survey on Medical Students' Perceptions of Community Medicine and Their Career Choices' (Maeno et al.).<sup>7</sup> We focused on what respondents might perceive as advantages and disadvantages of *Chiikiwaku* in their career development (Table 1).

### 2.2 | Respondents

All four medical schools in A prefecture have *Chiikiwaku* system, and the number of *Chiikiwaku* students and graduates exceeded 250 in 2020.<sup>9</sup> *Chiikiwaku* students and graduates in A prefecture are distributed across a metropolis of 2.3 million people and suburbs with tens of thousands of inhabitants. The study was conducted from October to December 2020. The survey was disseminated three times: at the start of the study, 2 weeks later, and just before the deadline. The data were collected by sending an email comprising documents explaining the study aim and requesting participation. The participants answered via a Google form uniform resource locator (URL). Completion of the questionnaire served as a substitute for obtaining written consent. Missing values were not handled. This study was approved by the ethical committee of two universities (approval numbers: 2020-0140-2 and 2020-137).

TABLE 1 A questionnaire of perception regarding *Chiikiwaku*.

Question items
1. I feel encouraged in my career development to have <i>Chiikiwaku</i> fellows.
2. I feel that the scholarships offered by the <i>Chiikiwaku</i> are an advantage.
3. When I applied for my university, I felt that choosing <i>Chiikiwaku</i> would be advantageous for my success.
4. I am concerned about the number of mandatory years I have to complete for the <i>Chiikiwaku</i> .
5. I feel uneasy because the image of the doctor I want to be is different from the image of the doctor required for <i>Chiikiwaku</i> .
6. I have a role model medical doctor who I want to be.
7. I believe that working as <i>Chiikiwaku</i> doctors is one of the solutions to the recent shortage of medical doctors and the uneven distribution of medical doctors in the region.
8. I feel insecure about balancing family life (marriage, childbearing, etc.) with being a <i>Chiikiwaku</i> doctor.
9. I am worried that my desired specialty will be different from the specialty required for <i>Chiikiwaku</i> .
10. I feel at ease by talking with my <i>Chiikiwaku</i> seniors, classmates, and juniors who are also from the same university.
11. I feel at ease by talking with my <i>Chiikiwaku</i> seniors, classmates, and juniors who are from other universities.
12. I am worried that the career development of <i>Chiikiwaku</i> doctors will be delayed compared to that of ordinary doctors.
13. I am concerned that being a <i>Chiikiwaku</i> doctor will delay me from obtaining a medical specialty.
14. I think there are restrictions by being a <i>Chiikiwaku</i> regarding marriage and childbearing.
15. I would like to work as a doctor or researcher abroad, and I am concerned about the number of mandatory years for <i>Chiikiwaku</i> .
16. I would like to apply to graduate school and am concerned about the conflict with the number of years required for <i>Chiikiwaku</i> .
17. I would like to have a different experience and make a different contribution, so I feel that I would benefit from <i>Chiikiwaku</i> .
18. I prefer not to tell people I belong to <i>Chiikiwaku</i> when I meet them for the first time.
19. I feel that <i>Chiikiwaku</i> restricts my hobbies and club activities.
20. I have never been particularly aware of any differences in being a <i>Chiikiwaku</i> from non- <i>Chiikiwaku</i> students or doctors.
21. I am concerned that I will not be able to meet the required competencies to practice as a <i>Chiikiwaku</i> doctor.
22. I would like to contribute, or am already contributing, to community health care as a <i>Chiikiwaku</i> doctor.

### 2.3 | Statistical analysis

The score of each question item was compared between *Chiikiwaku* students and graduates using the Mann-Whitney *U* test. We checked the commonality of question items and the internal consistency of the questionnaire. A *p*-value < 0.05 was considered statistically significant. Statistical analysis was performed using IBM SPSS version 27 (IBM Inc.; Armonk, NY, USA).

Question item (22 items)	Median (IQR 25, 75) of <i>Chiikiwaku</i> students (n = 57)	Median (IQR 25, 75) of <i>Chiikiwaku</i> graduates (n = 18)	p value
1	6.00 (4.00, 7.00)	5.00 (4.75, 6.00)	0.256
2	6.00 (4.00, 7.00)	4.00 (2.00, 5.00)	0.004*
3	3.00 (2.00, 5.00)	3.50 (1.00, 4.25)	0.985
4	5.00 (4.00, 7.00)	5.50 (4.00, 7.00)	0.461
5	3.00 (2.00, 5.00)	4.50 (2.75, 6.25)	0.091
6	3.00 (2.00, 4.00)	2.50 (2.00, 4.00)	0.843
7	5.00 (4.00, 6.00)	4.00 (2.00, 5.00)	0.001*
8	6.00 (4.00, 7.00)	5.00 (3.00, 6.00)	0.355
9	5.00 (3.00, 6.00)	4.50 (3.75, 7.00)	0.885
10	6.00 (5.00, 7.00)	5.00 (4.00, 6.25)	0.397
11	4.00 (3.00, 5.00)	4.00 (2.75, 5.00)	0.252
12	5.00 (2.50, 6.00)	5.00 (2.75, 6.25)	0.487
13	5.00 (2.00, 6.00)	5.00 (3.00, 6.00)	0.478
14	5.00 (3.50, 6.00)	4.00 (2.75, 5.25)	0.153
15	2.00 (1.00, 5.00)	3.00 (1.00, 5.00)	0.628
16	2.00 (1.00, 4.00)	4.50 (1.00, 6.25)	0.069
17	4.00 (2.00, 6.00)	3.00 (1.00, 4.25)	0.047*
18	2.00 (1.00, 5.00)	3.00 (1.00, 4.00)	0.854
19	1.00 (1.00, 3.00)	1.00 (1.00, 2.00)	0.594
20	3.00 (3.00, 6.00)	3.00 (2.00, 4.25)	0.109
21	4.00 (2.00, 5.00)	5.00 (2.00, 5.00)	0.950
22	6.00 (4.50, 7.00)	4.50 (4.00, 5.25)	0.010*

\* $p < 0.05$ .

### 3 | RESULTS

The response rates of all participants, medical students, and graduates were 60% (75/125), 67.8% (57/84), and 43.9% (18/41), respectively. There were 40 males, 32 females, and 3 who did not indicate their sex. Seventeen respondents were < 20 years old, 38 were between 20 and 24 years old, 17 between 25 and 29 years old, 1 between 30 and 34 years old, 1 between 35 and 39 years old, and 1 did not indicate the age. Of the 18 graduates who responded, 12 were junior residents and the others were senior residents. Table 2 demonstrates the medians, quartiles, and results of the two-group comparison of the questionnaire between *Chiikiwaku* students and graduates. *Chiikiwaku* students had significantly higher scores for question items 2, 7, 17, and 22 compared to *Chiikiwaku* graduates ( $p < 0.05$ ).

The commonality of question items 2, 3, 6, 19, 20, and 21 was < 0.4. Accordingly, these were deleted, and 16 items remained in the questionnaire.

Internal consistency was calculated based on Cronbach's alpha coefficient of all 16 items, which was 0.72.

### 4 | DISCUSSION

Compared to the graduates included in this pilot study, *Chiikiwaku* students felt that the scholarship provided was an advantage, considered

TABLE 2 The results of two-group comparison between *Chiikiwaku* students and graduates using Mann–Whitney *U* test.

the *Chiikiwaku* system as one of the solutions to the shortage of doctors and uneven regional distribution, and had a sense of mission to contribute to community healthcare. *Chiikiwaku* students also regarded each other as peers. The reason for higher scores of 'camaraderie in *Chiikiwaku*' and 'sense of mission to contribute to community healthcare' among medical students than graduates was considered that many *Chiikiwaku* graduates have concerns about life events such as marriage and child rearing, as well as the difficulty of balancing graduate school and study abroad with the fulfillment of obligations as previously reported.<sup>10</sup> Our results also showed that they also felt more burdened than medical students. Thus, *Chiikiwaku* programme provider should provide formal opportunities for *Chiikiwaku* graduates to contact their *Chiikiwaku* peers and mentors.

The Cronbach's alpha coefficient of the 16 items used was > 0.7 in the current study, indicating that the questionnaire was reliable in terms of internal consistency.<sup>11</sup> This questionnaire has a total of 16 items. Further research for development on the questionnaire of *Chiikiwaku* perception should be done.

#### 4.1 | Limitations

The lower-than-expected number of participants was possibly caused by the fact that the survey was ultimately limited to two universities. Further, the low response rate of *Chiikiwaku* graduates was

possibly influenced by the fact that their contact information had changed and were unavailable.

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## CONFLICT OF INTEREST STATEMENT

M.S, N.T, and K.M are members of the Graduate School of Medicine Endowed Chairs in Nagoya University, which is endowed by Aichi prefecture government and Nagoya city government. The other authors declare no conflicts of interest associated with this manuscript. Kei Miyazaki is an Editorial Board member of Journal of General and Family Medicine and a co-author of this article. To minimize bias, they were excluded from all editorial decision-making related to the acceptance of this article for publication.

## ETHICS APPROVAL STATEMENT

The subjects were informed by email, that their participation in the study was voluntary, they would have no disadvantage if they decided not to answer the questionnaire, and that their privacy would be protected because it was an anonymous online questionnaire.

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