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ORIGINAL RESEARCH

Characteristics of Japanese medical students associated with their intention for rural practice

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ABSTRACT

Introduction: In Japan, the maldistribution of physicians between urban and rural areas is increasing. It is important to know the practice location expectations of future physicians.

Methods: The study was designed as a cross-sectional survey. In 2009–2013, students at a medical school in Japan completed a questionnaire containing 50 items with four-point Likert scales. The students rated the importance of specified individual and occupational aspects. Furthermore, students were asked to state their intention to practice in a rural area.

Results: The study sample consisted of 368 students (88.2% response rate). Significant variables that were associated with a positively motivated intent for rural practice were 'presence of a role model' (odds ratio (OR), 5.42; 95% confidence interval (CI), 1.58–18.5), 'admission by school recommendation' (OR, 7.68; 95%CI, 2.14–27.6), 'growing up in a rural area' (OR, 6.16; 95%CI, 1.01–37.6), 'general medicine/family medicine as the first career choice' (OR, 5.88; 95%CI, 2.43–14.2), 'interest in the targeted population' (OR, 16.7; 95%CI, 3.97–69.9), 'memorable experience at a class or clinical rotation' (OR, 3.94; 95%CI, 3.73–416), and 'location of their medical school' (OR, 11.4; 95%CI, 2.79–46.2).

Conclusions: The present study suggests that medical schools might recruit students with characteristics associated with intention for rural practice.

Key words: attitudes, background factor, Japan, Japanese medical students, recruitment.

Introduction

In Japan, the shortage of physicians is well documented. There have been absolute and relative deficiencies in the number of physicians, and Japan is in the lowest group as ranked by the Organization for Economic Cooperation and Development (OECD)[1]. In addition, the gap in distribution of physicians between rural and non-rural areas has constantly been increasing since 1980[2], and there is maldistribution in the different specialties because few doctors choose specialties that cover a broad domain (eg general medicine/family medicine, internal medicine, pediatrics, surgery, and emergency medicine), which are needed especially in rural areas[3].

The Japanese government has recently implemented a form of rural quota at medical schools in all 47 prefectures. If the programs work successfully, the impact on the geographic distribution of physicians will be substantial[4]. In times of physician shortage, it is important for those seeking a career in medicine to know the expectations for future generation of physicians. In many other countries a lot of studies have been done to explore career choices of medical students[5-16]. In Japan, few studies have focused specifically on exploring characteristics and identifiers of medical students that will predict their intention to practise rurally[4,17-19]. Thus, identification of these relationships between various characteristics and intent for rural practice will assist Japanese medical schools to effectively recruit future rural physicians.

The purpose of this study was two-fold: to understand what career preferences medical students have at medical school and to determine the characteristics of medical students who intend to practice in a rural area.

Methods

Participants

This study was designed as a cross-sectional survey. Students from one Japanese regional university school of medicine were surveyed. From April 2009 to 2013 (in Japan, the academic year begins in April), a five-page entry questionnaire was administered within the first 4 weeks of the first semester of each medical school year.

Questionnaires

A self-administered questionnaire developed by Takeda et al[20] was used, enquiring about background factors and specialty preference. Sociodemographic questions regarding gender, age, academic year, type of high school, work experience before admission, relatives in the medical field, presence of a role model, scholarship, admission by school recommendation, admission by a special policy directly aimed to increase rural physicians as one main purpose (*chiiki-waku* in Japanese), and the area of living until the age of 18 years were included. Participants were asked to specify which of 14 medical specialties they intended to pursue: general medicine/family medicine, internal medicine subspecialty, surgery, pediatrics, obstetrics/gynecology, psychiatry, anesthesiology, emergency medicine, dermatology, orthopedics, ophthalmology, otolaryngology, urology and radiology, or 'other'. They were instructed to choose one as the most preferable specialty and other specialties 'under consideration', as many as applied. When 'other' was chosen for a non-listed specialty, the respondent was asked to specify which discipline they were choosing. They then indicated the degree to which their choice was influenced by 30 items (Table 1). The subscales of 'characteristics of the specialty' (10 items), 'personal experience' (3 items), 'experience at a medical school or during postgraduate training' (5 items), 'advice from others' (4 items), 'considering future work conditions' (8 items), and 'others'(1 item) cover reasons for choosing a specialty. The subscales of 'how important is the decision on where to practice in the future?' (20 items) describe the individual aspects. Influence of the responses to the subscales was rated on a four-point Likert scale (1='not at all'; 2='not particularly'; 3='fairly well'; 4='extremely well'). The authors defined 'no' as Likert scale from 1 to 2 and 'yes' from 3 to 4. The participants were asked whether they are willing to practice in a rural area (1='positively motivated'; 2='willing to work for a certain period of time'; 3='would rather avoid it'; 4='never').

Table 1: Reasons for choosing future career of participants by intent for rural practice

Characteristic	Total (*N*=368)	Intent for rural practice, *n* (%)			*p* for trend
		Positively motivated (*n*=66)	Certain period (*n*=208)	Avoid or never (*n*=94)	
Specialty of first career choice					
General/family medicine	69 (18,8)	20 (30.3)****	43 (20.7)***	6 (6.4)	<0.001
Other specialties	163 (44.3)	25 (37.9)	93 (44.7)	45 (47.9)	0.449
Characteristics of the specialty	163 (44.3)	25 (37.9)	93 (44.7)	45 (47.9)	0.449
Interest in clinical work of specialty	365 (99.2)	66 (100)	205 (98.6)	94 (100)	0.312
Interest in organs of specialty	263 (71.5)	47 (71.2)	146 (70.2)	70 (74.5)	0.747
Interest in target population (eg children, elderly)	252 (68.5)	52 (78.8)***	151 (72.6)***	49 (52.1)	<0.001
Interest in research or scientific aspects	272 (73.9)	49 (74.2)	151 (72.6)	72 (76.6)	0.763
Interested in surgical procedures or technologies	268 (72.8)	48 (72.7)	161 (77.4)*	59 (62.8)	0.030
Mastering a specialty	277 (75.3)	45 (68.2)	158 (76.0)	74 (78.7)	0.296
Have an aptitude for the specialty	311 (84.5)	54 (81.8)	181 (87.0)	76 (80.9)	0.312
Feel it rewarding to work in the specialty	357 (97.0)	66 (100)	201 (96.6)	90 (95.7)	0.265
Prospect for further development in the field	262 (71.2)	50 (75.8)	147 (70.7)	65 (69.1)	0.641
Highly respected in society	165 (44.8)	27 (40.9)	106 (51.0)**	32 (34.0)	0.018
Personal experience					
Suffer from an illness within that specialty	137 (37.2)	16 (24.2)*	83 (39.9)	38 (40.4)	0.055
Friend/family has an illness associated with specialized care	166 (45.1)	26 (39.4)	100 (48.1)	40 (42.6)	0.395
Became interested in the specialty before medical school	189 (51.4)	40 (60.6)	101 (48.6)	48 (51.1)	0.233
Experience at a medical school or during postgraduate training					
Memorable experience at a class or clinical rotation	290 (78.8)	58 (87.9)*	165 (79.3)	67 (71.3)	0.039
Received excellent teachings	303 (82.3)	57 (86.4)	169 (81.3)	77 (81.9)	0.632
Comfortable atmosphere at specialty department	295 (80.2)	56 (84.8)	161 (77.4)	78 (83.0)	0.305
Encounter with role model teachers	252 (68.5)	49 (74.2)	143 (68.8)	60 (63.8)	0.375
Encounter with role model junior doctors	183 (49.7)	35 (53.0)	105 (50.5)	43 (45.7)	0.628
Advice from others					
Advice/expectation of parents	134 (36.4)	18 (27.3)	78 (37.5)	38 (40.4)	0.208
Advice from senior students/residents	121 (32.9)	16 (24.2)	74 (35.6)	31 (33.0)	0.233
Advice from teachers/consultants	152 (41.3)	23 (34.8)	94 (45.2)	35 (37.2)	0.215
Influence of friends	91 (24.7)	15 (22.7)	53 (25.5)	23 (24.5)	0.901
Considering future work condition					
Job availability	198 (53.8)	29 (43.9)	117 (56.3)	52 (55.3)	0.205
Ease of opening a private practice	87 (23.6)	6 (9.1)*	58 (27.9)	23 (24.5)	0.007
Expectation to inherit a practice of parents/relatives	47 (12.8)	4 (6.1)	32 (15.4)	11 (11.7)	0.133
Expected income	148 (40.2)	14 (21.2)***	93 (44.7)	41 (43.6)	0.002
Length of working hours	177 (48.1)	26 (39.4)*	94 (45.2)*	57 (60.6)	0.013
Attainable lifestyle	237 (64.4)	39 (59.1)	135 (64.9)	63 (67.0)	0.572
Influence of future health care reform	137 (37.2)	23 (34.8)	75 (36.1)	39 (41.5)	0.603
Risk of malpractice law suits	136 (37.0)	20 (30.3)	78 (37.5)	38 (40.4)	0.414

P for trend from the χ^2 test for categorical variables. *p<0.05, **p<0.01, ***p<0.005, and ****p<0.001 vs 'avoid or never' group

Data analysis

Data are presented as the mean ± standard deviation (SD) unless otherwise specified. Statistical analysis was performed using IBM SPSS Statistics v21 (Statistical Package for the Social Sciences; http://www.spss.com). Differences were analyzed by one-way ANOVA test for continuing variables and the χ^2 test for categorical variables. Logistic regression analysis (backward elimination method) was used to evaluate the contribution of each confounding factor for the

participants' intent to practice in a rural area (eg 'positively motivated' or 'willing to work for a certain period' vs 'avoid' or 'never' groups). A value of $p<0.05$ was considered significant.

Ethics approval

The study was approved by the ethics committee of the Ehime University Graduate School of Medicine (2450960), and informed consent was obtained from all subjects.

Results

A total of 417 students completed the survey giving an 88.2% response rate (368 students). Characteristics of respondents and comparisons by practice intent are summarized (Table 2). Age of students opting for rural practice was significantly younger ($p=0.004$). Most students were in the first or second academic year ($p=0.005$) and had a higher rate for work experience before admission ($p=0.021$), relatives in the medical field ($p=0.015$), admission by school recommendation ($p=0.001$), admission by a special policy ($p=0.049$), and grew up in a rural area ($p=0.009$). There was no significant difference in intention for rural practice by gender, high school type, presence of a role model, or scholarship.

Reasons for the choice of specialty by the participants are summarized according to their intention for rural practice (Table 1). There were significant differences between students with and without the intention for rural practice. In particular, students with intent for rural practice had higher rates for selecting general medicine/family medicine as the first career choice ($p<0.001$), having interest in the target population (eg children, the elderly) ($p<0.001$) and surgical procedures or technologies ($p=0.030$), being highly respected in society ($p=0.018$), and having a memorable experience at a class or clinical rotation ($p<0.001$). However, fewer students with intention for rural practice were likely to be interested in ease of opening a private practice ($p=0.007$), expected income ($p=0.018$), and working hours ($p=0.013$).

Medical school students' opinions are summarized in relation to influences on their choice of practice and their opinion of physicians practising in a rural area (Table 3). Students intending rural practice were more likely to consider location of medical school ($p=0.002$) and availability of support from other doctors ($p<0.001$) as important, and less likely to consider educational environment for children ($p=0.003$), teaching opportunities ($p=0.011$), and income ($p<0.001$) as important.

Table 4 shows the odds ratios for each of the confounding variables by multivariate logistic regression analysis. Significant variables associated with positively motivated intent for rural practice are 'presence of a role model' (odds ratio (OR), 5.42; 95% confidence interval (CI), 1.58–18.5), 'admission by school recommendation' (OR, 7.68; 95%CI, 2.14–27.6), 'growing up in a rural area' (OR, 6.16; 95%CI, 1.01–37.6), 'general medicine/family medicine as a first career choice' (OR, 5.88; 95%CI, 2.43–14.2), 'interest in the targeted population' (OR, 16.7; 95%CI, 3.97–69.9), 'memorable experience at a class or clinical rotation' (OR, 3.94; 95%CI, 3.73–4.16), and 'location of their medical school' (OR, 11.4; 95%CI, 2.79–46.2). Significant variables associated with negative intent for rural practice were 'I suffer(ed) from an illness of the specialty' (OR, 0.28; 95%CI, 0.08–0.95), 'received excellent teachings' (OR, 0.02; 95%CI, 0.00–0.34), 'advice/expectation of parents' (OR, 0.29; 95%CI, 0.08–0.99), 'working hours' (OR, 0.14; 95%CI, 0.04–0.48), 'availability of nearby specialized hospitals for referrals' (OR, 0.14; 95%CI, 0.03–0.73), and 'income' (OR, 0.31; 95%CI, 0.10–0.98).

Discussion

The purpose of this study was to determine the characteristics associated with medical students who opt for rural practice. Some factors found to be important for recruiting in a rural area in previous studies[5,6] were also found to be important in this study. Medical students with 'presence of a role model', 'growing up in a rural area', 'admission by school recommendation', 'general medicine/family medicine as first

career choice', 'interest in the targeted population (eg children, the elderly)', 'memorable experience at a class or clinical rotation', and 'location of the medical school' are more likely to opt for rural practice. These suggest that students' characteristics may be strongly correlated with opting for rural practice and it is imperative that Japanese medical schools promote admission by school recommendation of such students in order to solve the shortage of physicians in rural areas.

With the continuing need for rural physicians, conditions associated with medical students' intention for rural practice need to be identified and addressed. The factor most often found to influence rural practice preference is having a rural background such as a 'rural origin'[7], 'growing up in a rural area'[8-10], and 'graduating from a rural high school'[10]. The present study supports these researches and most of these predictive factors can be identified at the time of admission to medical school. Thus, medical schools should actively recruit students who have lived in a rural area. However, recruitment of students with rural backgrounds may be difficult because there are a limited number of students from rural areas who are interested in becoming physicians[8].

The study data show that 'general/family medicine as the first career choice' is also important in opting for rural practice. Medical students understand that career choice of family/general medicine is necessary for rural practice, which is expected to cover a broad range of conditions. Rabinowitz demonstrated that students with an interest in family medicine who enter medical school are more likely than their peers to become family physicians or to practice in a rural area[11]. Moreover, in the choice of specialties, although many medical students frequently change their minds about the specialty they select, most students usually consider themselves as either generalists or specialists and their career choice of generalist is more consistent than that of other specialties[12,13]. In addition, medical students tend not to switch into family medicine if this choice had not been considered from the outset[12]. Thus, the percentage of students interested in family medicine as the first career choice reflect a preference for a career in family medicine at graduation[14].

'Presence of a role model' and 'memorable experience at a class or clinical rotation' were also strongly correlated with opting for rural practice. It is important for medical students to meet rural family physicians as role models. Exposure to rural practice in undergraduate medical education has been demonstrated as an encouraging factor for future rural practice[7,15,19]. The present study's results showed that opportunities for rural exposure in medical schools may be effective for recruitment. However, programs with short rural exposure are ineffective in shaping students' career choices and decisions on internship location[16]. Rural exposure at the undergraduate and graduate levels performed recently in Japanese medical schools is a short rotation (1 to 2 weeks), and the experience may be daunting.

'Admission by school recommendation' may increase interest in rural practice. This is a system in which students can enter a medical school on the assumption that they remain and work in a local prefecture after graduation, although this system is not binding. However, medical students' thoughts may be related to their intent for rural practice. In the present study, scholarship was not important for intent for rural practice because the duty after graduation is not necessarily followed by a scholarship system. On the other hand, programs such as debt cancellation of student loans may be useful in recruiting students to rural practice[8]. In Japan, Jichi Medical University (JMU) was established in 1972 to supply graduates to rural areas and has several unique characteristics aimed at motivating graduates to opt for rural practice, and has achieved its aim of supplying doctors to rural areas[4,21]. Therefore, the government has recently implemented a JMU-like contractual program as a form of rural quota at other medical schools in all 47 prefectures[4].

'I suffer(ed) from an illness of the specialty', 'received excellent teachings', 'advice/expectation of parents', 'working hours', 'availability of nearby specialized hospitals for referrals', and 'income' are characteristic backgrounds that were negatively associated with medical students' intention for rural practice. Medical students who opt for rural practice demonstrate flexibility, self-reliance, and internal motivation.

Table 2: Characteristics of participants by intent for rural practice

Characteristic	Total (*N*=368)	Intent for rural practice, *N* (%)			*p* for trend
		Positively motivated (*n*=66)	Certain period (*n*=208)	Avoid or never (*n*=94)	
Gender					
Male	227 (61.7)	41 (62.1)	127 (61.1)	59 (62.8)	0.958
Female	141 (38.3)	25 (37.9)	81 (38.9)	35 (37.2)	
Age (years)	21.4 ± 3.6	20.2 ± 2.5†	21.8 ± 3.9	21.5 ± 3.1	0.004
Academic year					
1st–2nd	179 (48.6)	44 (66.7)**	93 (44.7)	42 (44.7)	0.005
3rd–5th	189 (51.4)	22 (33.3)	115 (55.3)	52 (55.3)	
Public high school					
Yes	195 (53.0)	41 (62.1)*	113 (54.3)	41 (43.6)	0.059
No	173 (47.0)	25 (37.9)	95 (45.7)	53 (56.4)	
Work experience before admission					
Yes	17 (4.6)	0	15 (7.2)	2 (2.1)	0.021
No	351 (95.4)	66 (100)	193 (92.8)	92 (97.9)	
Presence of medical relatives					
Yes	162 (44.0)	19 (28.8)	102 (49.0)	41 (43.6)	0.015
No	206 (56.0)	47 (71.2)	106 (51.0)	53 (56.4)	
Presence of a role model					
Yes	152 (41.3)	34 (51.5)	85 (40.9)	33 (35.1)	0.114
No	216 (58.7)	32 (48.5)	123 (59.1)	61 (64.9)	
Scholarship					
Yes	115 (31.2)	28 (42.4)	61 (29.3)	26 (27.7)	0.093
No	253 (68.8)	38 (57.6)	147 (70.7)	68 (72.3)	
Admission by school recommendation					
Yes	71 (19.3)	17 (25.8)**	45 (21.6)**	9 (9.6)	0.017
No	297 (80.7)	49 (74.2)	163 (78.4)	85 (90.4)	
Admission by a special policy					
Yes	29 (7.9)	10 (15.2)*	14 (6.7)	5 (5.3)	0.049
No	339 (92.1)	56 (84.8)	194 (93.3.)	89 (94.7)	
Growing up in a rural area					
Yes	47 (12.8)	15 (22.7)***	26 (12.5)	6 (6.4)	0.009
No	321 (87.2)	51 (77.3)	182 (87.5)	88 (93.6)	

P for trend from one-way ANOVA test and multiple comparison with Bonferroni method for continuing variables, and the χ^2 test for categorical variables. †p=0.002 vs 'certain period' group. *p<0.05, **p<0.01, and ***p<0.005 vs "avoid or never" group.

Some limitations of this study must be considered. First, the cross-sectional study design does not eliminate potential causal relationships between characteristics of medical students and intention for rural practice. Second, the OR associated with rural upbringing was higher than has been reported in studies examining factors related to rural practice choice. This is possibly due to the fact that the characteristics evaluated in this study were based on intent rather than actual practice; rural upbringing may have a greater effect on intent than on final choice of practice[8]. Third, this study was on a limited number of students who belong to one regional university. Therefore, the students were more likely to choose rural practice than students from other schools. Fourth, this study measured students' intent for rural practice but not their actual choice of practice because students' intent was measured prior to residency. Fifth, as the authors used a self-administered questionnaire developed for fourth and sixth-year medical students[20], some of the characteristics examined appeared to be suitable for upper grade students (eg specialty choice) but not for undergraduate students. Sixth, the authors defined 'no' as the Likert scale from 1 to 2 and 'yes' from 3 to 4, and this may affect the interpretation of the results of this study. Future research using longitudinal data collection will enable the authors to monitor the relationship between early stated intentions, medical educational experiences, and actual behavior.

Table 3: Reasons for participants' choice of a practice location by intent for rural practice

Characteristic	Total (*N*=368)	Intent for rural practice, *N* (%)			*p* for trend
		Positively motivated (*n*=66)	Certain period (*n*=208)	Avoid or never (*n*=94)	
Hometown	308 (83.7)	49 (74.2)*	176 (84.6)	83 (88.3)	0.052
Hometown of partner	247 (67.1)	38 (57.6)	143 (68.8)	66 (70.2)	0.184
Parents' residence	260 (70.7)	40 (60.6)	156 (75.0)	64 (68.1)	0.067
Partner's career	256 (69.6)	39 (59.1)	151 (72.6)	66 (70.2)	0.114
Partner's preference	288 (78.3)	46 (69.7)	168 (80.8)	74 (78.7)	0.163
Educational environment for children	310 (84.2)	47 (71.2)***	178 (85.6)	85 (90.4)	0.003
Location of medical school	145 (39.4)	31 (47.0)***	91 (43.8)***	23 (24.5)	0.002
Location of teaching hospital where completed residency	190 (51.6)	31 (47.0)	113 (54.3)	46 (48.9)	0.484
Career development	250 (67.9)	38 (57.6)	150 (72.1)	62 (66.0)	0.079
Research environment	166 (45.1)	31 (47.0)	95 (45.7)	40 (42.6)	0.832
Teaching opportunities	85 (23.1)	11 (16.7)	60 (28.8)**	14 (14.9)	0.011
Availability of nearby specialized hospitals for referrals	305 (82.9)	55 (83.3)	173 (83.2)	77 (81.9)	0.959
Availability of support from other doctors	338 (91.8)	61 (92.4)	200 (96.2)****	77 (81.9)	<0.001
Community atmosphere	295 (80.2)	57 (86.4)	166 (79.8)	72 (76.6)	0.307
Climate and/or natural environment	270 (73.4)	52 (78.8)	156 (75.0)	62 (66.0)	0.141
Lifestyle	321 (87.2)	52 (78.8)	185 (88.9)	84 (89.4)	0.076
Income	234 (63.6)	28 (42.4) **	145 (69.7)	61 (64.9)	<0.001
Possibility of inheriting practice of parents/relatives	52 (14.1)	4 (6.1)	35 (16.8)	13 (13.8)	0.091
Assignment from department head	143 (38.9)	26 (39.4)	82 (39.4)	35 (37.2)	0.932

P for trend from the χ^2 test for categorical variables. *p<0.05, **p<0.01, ***p<0.005, and ****p<0.001 vs 'avoid or never' group.

Table 4: Multiple logistic regression models of confounding factors for intent for rural practice

Characteristics	Intent for rural practice	
	'Positively motivated' vs 'avoid or never' (*n*=160) OR (95%CI)	'Certain period' vs 'avoid or never' (*n*=302) OR (95%CI)
Gender (0=female, 1=male)	3.13 (0.93–10.6)	–
Academic year (0=1st–2rd, 1=3th–5th)	–	–
Work experience before admission	–	3.66 (0.69–19.4)
Presence of medical relatives	0.31 (0.09–1.07)	1.91 (1.03–3.55)
Presence of role model	5.42 (1.58–18.5)	–
Scholarship	–	–
Admission by school recommendation	7.68 (2.14–27.6)	–
Admission by a special policy		
Growing up in a rural area	6.16 (1.01–37.6)	2.83 (0.99–8.10)
General medicine/family medicine as first career choice	5.88 (2.43–14.2)	1.65 (1.09–2.51)
Interest in the targeted population (e.g. children, the elderly)	16.7 (3.97–69.9)	2.00 (1.08–3.71)
Interested in the surgical procedures or technologies	–	2.63 (1.36–5.09)
Have an aptitude for the specialty	–	–
Highly respected in society	–	1.72 (0.93–3.20)
Suffer from an illness that is cared by the particularly specialty	0.28 (0.08–0.95)	–
Became interested in the specialty before medical school	–	0.59 (0.32–1.08)
Memorable experience at a class or clinical rotation	3.94 (3.73–4.16)	3.01 (1.19–7.60)
Received excellent teachings	0.02 (0.00–0.34)	0.43 (0.16–1.18)
Comfortable atmosphere at the specialty department	4.56 (0.86–24.1)	–

Table 4: cont'd

Characteristics	Intent for rural practice	
	'Positively motivated' vs 'avoid or never' (*n*=160) OR (95%CI)	'Certain period' vs 'avoid or never' (*n*=302) OR (95%CI)
Advice/expectation of parents	0.29 (0.08–0.99)	0.47 (0.25–0.91)
Ease of opening a private practice	–	–
Expected income	–	–
Length of working hours	0.14 (0.04–0.48)	0.55 (0.30–0.99)
Influence of future health care reform	–	0.42 (0.22–0.80)
Partner's career	0.38 (0.12–1.20)	–
Location of medical school	11.4 (2.79–46.2)	1.91 (1.02–3.60)
Teaching opportunities	–	2.08 (0.95–4.54)
Location of teaching hospital where completed residency	0.35 (0.10–1.26)	–
Availability of nearby specialized hospitals for referrals	0.14 (0.03–0.73)	0.33 (0.11–0.96)
Availability of support from other doctors	–	12.2 (3.26–45.7)
Climate and/or natural environment	–	–
Income	0.31 (0.10–0.98)	–
Possibility of inheriting a practice of parents/relatives	–	–

CI, confidence interval. OR, odds ratio. –, was not retained in the final model by logistic regression analysis (backward elimination method).

Conclusions

The present study showed that in order to provide rural areas with physicians, Japanese medical schools might promote admission by school recommendation of students who display the characteristics that are associated with their intention for rural practice and give such students a memorable experience in their educational training.

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