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The difference between medical students interested in rural family medicine versus urban family or specialty medicine

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Objective: To determine how first-year medical students interested in rural family medicine in Canada differ from their peers.

Method: From 2002 to 2004, first-year students ($n = 2189$) from 16 classes in 8 Canadian medical schools ranked intended career choices and indicated influences on their choices using Likert scales. We used t tests and χ^2 tests to determine demographic influences and factor analysis, and we used analysis of variance to examine associated attitudes.

Results: Of the 1978 surveys returned (90.3%), 1905 were used in the analysis. Rural family medicine was ranked first by 11.1%, varying from 4.7% to 20.2% among schools. Students interested in rural family medicine were more likely to have grown up rurally, graduated from a rural high school and have family in a rural location than others ($p < 0.001$). They were more likely to be older, in a relationship, to have volunteered in a developing nation and less likely to have university-educated parents than those interested in a specialty ($p < 0.008$). Attitudes of students choosing family medicine, rural or urban, include social orientation, preference for a varied scope of practice and less of a hospital orientation or interest in prestige, compared with students interested in specialties ($p < 0.001$).

Conclusion: Medical schools may address the rural physician shortages by considering student demographic factors and attitudes at admission.

Objectif : Déterminer ce qui distingue de leurs pairs les étudiants de première année de médecine qui s'intéressent à la médecine familiale en milieu rural au Canada.

Méthode : De 2002 à 2004, les étudiants de première année ($n = 2189$) de 16 classes de 8 facultés de médecine canadiennes ont classé leur choix de carrière éventuel et indiqué les facteurs qui ont influencé leur choix en utilisant des échelles de Likert. Nous avons utilisé des tests t et des tests de χ^2 pour déterminer les influences démographiques et l'analyse des facteurs, et nous avons analysé les études connexes au moyen d'une analyse de variance.

Résultats : Sur les 1978 questionnaires reçus (90,3 %), 1905 ont servi à l'analyse. La médecine familiale en milieu rural a été le premier choix de 11,1 % des répondants (pourcentage variant de 4,7 % à 20,2 % entre les facultés). Les étudiants intéressés par la médecine familiale en milieu rural étaient plus susceptibles que les autres ($p < 0,001$) d'avoir grandi en milieu rural, d'avoir obtenu leur diplôme d'une école secondaire rurale et d'avoir de la famille en milieu rural. Ils étaient plus susceptibles d'être plus âgés, de vivre avec un(e) partenaire et d'avoir fait du bénévolat dans un pays en développement, et moins susceptibles d'avoir des parents ayant fait des études universitaires que les étudiants intéressés à une spécialité ($p < 0,008$). Les attitudes des étudiants qui choisissent la médecine familiale, en milieu rural ou urbain, comprennent l'orientation sociale, la préférence pour un champ de pratique varié et le fait d'être moins orientés vers l'hôpital et moins intéressés par le prestige que les étudiants qui privilégient une spécialité ($p < 0,001$).

Conclusion : Les facultés de médecine pourraient s'attaquer aux pénuries de médecins en milieu rural en tenant compte, au moment de l'admission, des caractéristiques démographiques des étudiants et de leurs attitudes.

INTRODUCTION

The decline in medical student interest in family medicine as a career choice is well-documented in Canada and worldwide.^{1,2} This is a concern in Canada as family physicians provide most of the care in rural locations.³ Approximately 25.5% of Canadians live in rural areas,⁴ but of Canada's 31 286 physicians practising family medicine, only 4962 (15.9%) of them practise in rural areas.⁵ Another contributor to the rural physician shortage is the perception that rural medicine carries a heavier work burden at a time when students may be more interested in work balance and lifestyle.⁶ Also, women are less likely to choose rural medicine. With increasing proportions of women in medicine, this shortage is likely to intensify.⁷ Admission committees concerned with the social accountability of medical schools may be interested in knowing what factors are associated with student interest in a career in rural medicine. This may assist admission committees in the appropriate selection of incoming students to meet rural health care needs.

Known predictors for students choosing family medicine as a career choice include female sex, older age and concern about medical lifestyle.⁸ The students also have a "societal orientation," a desire for a "varied scope of practice" and are less likely to be "hospital oriented."¹ Students who choose to specialize may be more "abstract" in their thinking and more "conscientious" and "rule-bound."⁸ Students choosing specialties are also more likely to be male and to have a father practising medicine.⁸ The predictors of an interest in a family medicine career are not specific to an interest in rural family medicine.

There is strong evidence that students who have a rural background are more likely to enter rural medicine either as general practitioners or specialists, regardless of the time spent in the rural area as a child.⁸⁻¹⁰ Students with a rural background are more likely to be both interested in rural practice and currently practising rural family medicine than their urban-raised peers.^{11,12} Furthermore, those choosing family medicine (rural or urban) as a probable career on entry into medical school are more likely to have lived in smaller communities at the time of high school completion.¹ However, rural background is not necessary for an interest in rural family medicine, as 34%–67% of rural doctors have urban backgrounds.¹³

Australian students intent on rural general practice value the nature of the community and a sense of belonging more highly than their urban counterparts. Students intending to practise in urban areas

cite income, access to facilities, and family and professional needs as more important, compared with their peers who intend to go into rural practice. These findings may not be applicable in Canada as the perception that urban general practitioners earn more money than rural ones may not be true in Canada.¹⁴ In this study, we explore how medical students with an interest in rural family medicine differ from their peers interested in urban family medicine or in specialty practice in Canada.

METHODS

We collected data from first-year medical students in 16 classes who commenced medical school from 2002 to 2004, inclusive. There were 3 classes each from the University of British Columbia and the University of Calgary; 2 classes each from the University of Toronto, McMaster University, Queen's University and the University of Western Ontario; and 1 class each from the University of Ottawa and the University of Alberta.

The students were asked to complete a 6-page entry questionnaire developed by Wright and colleagues¹ within 1 month of beginning medical school. Students were asked to rank their top 3 career choices from the following 9 options: emergency medicine, urban family medicine, rural family medicine, internal medicine, obstetrics and gynecology, pediatrics, psychiatry, surgery and "other," with a space to list their other fields of interest. Career choices were then expressed as 3 groups: rural family medicine, urban family medicine and specialty medicine. Students were asked to both rank and indicate the degree to which 27 attitudinal variables (Box 1) influenced their first-ranked choice using a 5-point Likert-type scale ranging from 1 (no influence) to 5 (major influence). Demographic data were collected.

Analysis

Statistical analysis was conducted using SPSS Version 11.0 (SPSS, Inc., Chicago, Illinois). Rates, *t* tests and χ^2 tests were used to compare demographics according to career choice. Factor analysis was used to identify groupings of the attitudinal variables that influenced career choice. Items with an Eigen value greater than 1 were retained. The minimum factor loading was set at 0.5. The mean value of Likert scale items that loaded on each factor was calculated for each student. Analysis of variance, followed by the Scheffé post-hoc test, was then carried

out to assess differences among the 3 career choice groups for each of the 6 resulting attitudinal factors.

RESULTS

We asked 2189 students to complete the questionnaire. We received 1978 surveys, with a response rate of 90.3%. Incomplete surveys were excluded. There were 60 surveys without a specific career preference indicated and 13 respondents who were unsure of a specific career preference at the time. The final sample of 1905 was included in the analysis.

Career choice

Of the total sample, 11.1% named rural family medicine as their first career choice (Table 1). The proportion of students choosing family medicine varied greatly among medical schools (4.7%–20.2%) (Table 2).

Demographics

The demographic profiles of students interested in rural family medicine, urban family medicine or a

specialty are shown in Table 3. Students who identified rural family medicine as their first choice of career were significantly less likely to be single than students identifying other career choices. They were also more likely than other students to have completed high school in a town with a population below 50 000, to have spent more than one-half of their childhood in a rural community, to have parents, grandparents and siblings still living in a rural community, and to show a desire to work in a rural community after graduation. In addition, students who identified rural family medicine as their first choice of career were older, less likely to have university-educated parents and less likely to have family or friends practising medicine than students who identified a specialty as their first choice of career. They were also less likely to be female than students who identified urban family medicine as their first choice of career.

The proportion of students who had done volunteer work in certain fields also differed according to career choice (Table 4). Students who ranked rural family medicine as their first choice were less likely to have undertaken volunteer work within hospitals and more likely to have undertaken volunteer work in developing nations than those choosing a specialty.

Box 1. Possible influences on first choice career

1. Wide variety of patient problems
2. Narrow variety of patient problems
3. Good match to career
4. Interesting patient population
5. Focus on in-hospital care
6. Focus on patients in the community
7. Focus on urgent care
8. Focus on non-urgent care
9. Immediate results of interventions
10. Adequate income to eliminate debt
11. High income potential
12. Long-term relationship with patients
13. Status among colleagues
14. Acceptable on-call schedule
15. Don't like uncertainty
16. Prefer medical to social problems
17. Emulate a known physician
18. Interest in research
19. Social commitment
20. Stable and secure future
21. Health promotion is important
22. Acceptable hours of practice
23. Flexibility inside medicine
24. Flexibility outside medicine
25. Keep all options open
26. Past experience with physician
27. Short postgraduate training

Table 1. Students' top choice of career

Career choice	No. of students (and %), n = 1905
Internal medicine	426 (22.4)
Surgery	323 (17.0)
Pediatrics	303 (15.9)
Urban family medicine	284 (14.9)
Rural family medicine	211 (11.1)
Emergency	110 (5.8)
Obstetrics and gynecology	77 (4.0)
Psychiatry	62 (3.3)
Other	109 (2.7)

Table 2. Students' career choice according to medical school

Medical school	Career choice; no. (and %) of students		
	Rural family medicine	Urban family medicine	Specialty
University of British Columbia	64 (15.1)	79 (18.7)	280 (66.2)
University of Calgary	25 (8.6)	43 (14.7)	224 (76.7)
University of Alberta	7 (6.0)	9 (7.7)	101 (86.3)
University of Toronto	17 (4.7)	52 (14.4)	293 (80.9)
University of Ottawa	13 (10.5)	27 (21.8)	84 (67.7)
McMaster University	39 (20.2)	26 (13.5)	128 (66.3)
Queen's University	22 (12.0)	26 (14.2)	135 (73.8)
University of Western Ontario	24 (11.4)	22 (10.4)	165 (78.2)

In addition, they were more likely to have done volunteer work in sports than those interested in urban family medicine.

Attitudes

With factor analysis we determined how the 27 items influencing students' career choice grouped together to create a smaller number of underlying factors. Twenty-two items clustered into 6 factors (medical lifestyle, social orientation, prestige, hospital orientation, role model and varied scope of practice) explained 52.9% of the variance. The 6 factors and

respective items that composed each factor are presented in Box 2.

With respondents grouped according to first career choice, a comparison of their mean factor scores is shown in Table 5.

DISCUSSION

The proportion of students choosing a career in family medicine (rural or urban) on entry to medical school in this study was 26%, similar to the 26.4% of students choosing family medicine as their first choice in the Canadian Resident Matching

Table 3. Demographic differences according to career choice

Demographic	Career choice; % of students*			p value
	Rural family medicine, n = 211	Urban family medicine, n = 284	Specialty, n = 1410	
Age, yr	25.9	24.7	—	0.101
	25.9	—	23.7	< 0.001
	—	24.7	23.7	< 0.001
Female sex	60.8	72.0	—	0.009
	60.8	—	53.7	0.055
	—	72.0	53.7	< 0.001
Relationship status (single)	54.5	65.6	—	0.013
	54.5	—	74.0	< 0.001
	—	65.6	74.0	0.004
Premedical education (science)	90.1	90.8	—	0.784
	90.1	—	92.0	0.367
	—	90.8	92.0	0.535
Postgraduate education	14.7	20.4	—	0.101
	14.7	—	19.9	0.075
	—	20.4	19.9	0.828
Parental education (university educated)	66.5	71.8	—	0.204
	66.5	—	77.5	0.001
	—	71.8	77.5	0.039
Family or friends in medicine	33.2	37.3	—	0.340
	33.2	—	40.7	0.037
	—	37.3	40.7	0.288
Family or friends in family medicine	23.7	23.9	—	0.949
	23.7	—	18.7	0.083
	—	23.9	18.7	0.040
Population of town where high school was completed < 50 000	53.6	15.2	—	< 0.001
	53.6	—	18.3	< 0.001
	—	15.2	18.3	0.217
Rural childhood (> 50%)	56.3	14.6	—	< 0.001
	56.3	—	17.8	< 0.001
	—	14.6	17.8	0.193
Rural parents	57.8	18.7	—	< 0.001
	57.8	—	18.6	< 0.001
	—	18.7	18.6	0.975
Rural grandparents	37.9	16.5	—	< 0.001
	37.9	—	19.1	< 0.001
	—	16.5	19.1	0.318
Rural siblings	33.2	10.2	—	< 0.001
	33.2	—	10.6	< 0.001
	—	10.2	10.6	0.858
Proposed work community (< 50 000)	69.6	6.3	—	< 0.001
	69.6	—	7.2	< 0.001
	—	6.3	7.2	0.674

*Unless otherwise indicated.

Service in 2004 (CaRMS 2004).¹⁵ Interest in rural family medicine on entry to medical school across the country ranged from 4.7% at the University of Toronto to a high of 20.2% at McMaster University. This may be owing to a self-selection process or to the number of students from a rural background who are enrolled at each university.¹⁶ A percentage of students interested in rural medicine identified emergency medicine as a secondary career option, which may suggest perceived similarities between the 2 disciplines or awareness that running the emergency department in a small-town hospital is the responsibility of the family physicians. Although the individual students choosing family medicine may differ from entry to graduation, Colquitt and colleagues¹⁷ reported that the best predictor of eventual practice of family medicine is interest at matriculation. Others¹⁸ credit postadmission recruitment. It may be important to differentiate students who express an interest in family medicine or generalism on entrance to medical school from those who express interest during an interview. So far, the data show that career interest expressed at an interview may not actually reflect students' true interests.⁹

Our research confirmed the findings of other studies. We found that students interested in rural family practice are more likely to have spent most of their childhood living in a rural community and to have graduated from high school in a smaller community than those interested in either urban family medicine or a specialty. It is not surprising then that students interested in rural practice are also more likely to have parents or grandparents living in a rural community than those interested in urban family or specialty medicine.

A sex imbalance across career choices is apparent

early in medical training, with more men than women interested in rural family medicine or a specialty, while urban family practice appeals to more women than men. Past research has shown this imbalance to persist throughout medical school and into practice.⁵

In contrast with other studies, we found no difference in age between students interested in rural family medicine and their urban peers interested in family

Box 2. The factors and underlying influences on career choice

Factor 1: Medical lifestyle

- 24. Flexibility outside of medicine
- 22. Acceptable hours of practice
- 23. Flexibility inside of medicine
- 14. Acceptable on-call schedule
- 25. Keeping options open

Factor 2: Social orientation

- 21. Health promotion important
- 12. Long-term relationship with patients
- 6. Focus on patients in the community
- 19. Social commitment
- 4. Interesting patient population

Factor 3: Prestige

- 11. High income potential
- 10. Adequate income to eliminate debt
- 13. Status among colleagues
- 20. Stable/secure future

Factor 4: Hospital orientation

- 7. Focus on urgent care
- 5. Focus on in-hospital care
- 9. Results of interventions immediately available
- 16. Prefer medical to social problems

Factor 5: Role model

- 26. Meaningful past experience with physician
- 17. Emulate a physician

Factor 6: Varied scope of practice

- 1. Wide variety of patient problems
- 2. Narrower variety of patient problems*

*Recorded in reverse order as going in opposite direction to other influence in factor.

Table 4. Differences in volunteer work according to career choice

Type of volunteer work	Career choice; %			Results of χ^2 tests; <i>p</i> value
	Rural family medicine, <i>n</i> = 211	Urban family medicine, <i>n</i> = 284	Specialty, <i>n</i> = 1410	
Work within hospitals	64.5	69.0	—	0.286
	64.5	—	73.4	0.007
	—	69.0	73.4	0.130
Work in developing countries	27.0	23.9	—	0.437
	27.0	—	19.1	0.008
	—	23.9	19.1	0.065
Work with sports	53.6	38.7	—	0.001
	53.6	—	48.5	0.172
	—	38.8	48.5	0.003
Work with people with physical disabilities	40.3	45.4	—	0.254
	40.3	—	38.4	0.608
	—	45.4	38.4	0.028

medicine. Younger students were more likely to consider longer training programs. There may be an interaction of age and rural background. Age increased with the proportion of childhood spent in a rural community, and we know that the rurally raised student is also more likely to choose rural family medicine. Consequently, the older the student, the more likely they are to be from a rural area and the more likely they are to choose rural family medicine.

Students interested in rural family medicine are more likely to be in a relationship than those interested in urban family medicine. Students interested in rural medicine are both older and more likely to be in a relationship than those interested in a specialty. This may explain findings that spouses influence practice location of family medicine graduates.¹⁹

Students interested in the specialties were more likely to have a parent with a university education than those interested in either a rural or an urban family medicine career. They were also more likely to have family or friends practising medicine than students interested in rural family medicine. Expectations for a specialty career might be related to anticipated prestige associated with longer, or a perception of more difficult, training. Further investigation is needed to understand this finding.

"Medical lifestyle" was a more important influence on students choosing rural family medicine, compared with those choosing a specialty, but it was a less important influence compared with students choosing urban family medicine. Thus students interested in rural family medicine value lifestyle but also recognize that work and practice realities of rural medicine are less predictable than urban family practice. Both family medicine groups ranked "social orientation" and "varied scope of practice" as important, attesting to perceptions of family medicine as a varied practice meeting the needs of a community. Those interested in a specialty gave priority to "prestige" and "hospital orientation," which may be attributes perceived in specialty practice and not

a motivating factor for students interested in family medicine.^{12,20}

Students interested in rural family medicine were more likely to have participated in volunteer work in a developing nation than those interested in a specialty; however, an extended period of time spent living or travelling in a developing country was not associated with that career choice. We hypothesize that this relationship may have to do with the interest and possibly the skills obtained while volunteering in developing nations, as most medical work in developing nations is in primary care because resources for secondary and tertiary care are limited. Thus students who are interested in rural medicine may have experience in developing countries where they are exposed to the need for primary care and understand that providing comprehensive care is possible in locations without specialists. In addition, they were less likely to have volunteered in a hospital than students interested in the specialties and more likely to have volunteered in sports than their urban colleagues interested in family medicine. This suggests an appreciation for the opportunities available in a rural setting.

Overall, the response rate in this study was high and included students from 3 western medical schools and 5 eastern medical schools, which supports the generalizability of results to the entire Canadian medical education community.

Limitations

This study is limited owing to its cross-sectional design. Students' first choice of career on entry into medical school may not reflect their ultimate career choice. The survey instrument may not be sensitive enough to detect attitudinal differences between students interested in rural and urban family medicine, as most of the differences noted were demographic. Further studies exploring the values associated with career choice might uncover more complex influences

Table 5. Mean factor scores according to first choice of career (5-point Likert scale)

Factor name	Career choice; mean score			Results of ANOVA	
	Rural family medicine, <i>n</i> = 211	Urban family medicine, <i>n</i> = 284	Specialty, <i>n</i> = 1410	F	<i>p</i> value
Medical lifestyle	3.71	3.97	3.46	46.04	< 0.0005
Social orientation	4.20	4.12	3.35	221.90	< 0.0005
Prestige	1.71	1.85	2.10	25.49	< 0.0005
Hospital orientation	2.32	2.26	3.08	163.31	< 0.0005
Role model	2.81	2.82	2.72	0.89	0.415
Varied scope of practice	4.32	4.12	3.11	244.27	< 0.0005

ANOVA = analysis of variance.

on career choice among medical students. Finally a larger sample size, including all Canadian medical schools, would strengthen our findings.

CONCLUSION

Students who indicate rural family medicine as a first career choice on entry to medical school are more likely than the others to have lived most of their childhood in a rural community, graduated from a rural high school and have family living in a rural location. They are also more likely to be older, male, be involved in a relationship, less likely to have a parent with university education, more likely to have volunteered in a developing nation and more likely to volunteer in sports. Attitudes of students choosing family medicine, rural or urban, include more of a social orientation and less of a hospital orientation, a preference for a varied scope of practice and a lower interest in prestige than students interested in a specialty. Lifestyle is important to students interested in family medicine, but less so for rural-oriented students. While many factors may influence students' final career choice, medical schools can address the shortage of rural physicians by attending to demographic factors and the attitudes of students at admission to select students likely to fill this need.

Competing interests: None declared.

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