

Evaluation of a pre-professional pathway program: perspectives of former students in the rural pre-medicine program at Selkirk College

Évaluation d'un programme de parcours pré-professionnel : points de vue d'anciens étudiants du programme pré-médical en milieu rural du Selkirk College

Sara McEwen,¹ Jonathan Vanderhoek,¹ Takaia Larsen¹

¹Rural Pre-Medicine Program, Selkirk College, British Columbia, Canada

Correspondence to: Sara McEwen; email: sara.mcewen@gmail.com

Published ahead of issue: Sept 19, 2023; CMEJ 2023 Available at <https://doi.org/10.36834/cmej.76951>

© 2023 McEwen, Vanderhoek, Larsen; licensee Synergies Partners. This is an Open Journal Systems article distributed under the terms of the Creative Commons Attribution License. (<https://creativecommons.org/licenses/by-nc-nd/4.0>) which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is cited.

Abstract

Background: Having a rural background is one of the most predictive factors in eventually having a rural practice, but people from rural areas face several barriers to post-secondary education. Pre-professional rural pathway initiatives are a potential solution. The Rural Pre-Medicine Program (RPM) at Selkirk College, British Columbia was developed to provide students with the credits necessary to apply to medicine and other health professional programs, an introduction to rural healthcare issues, and a unique and comprehensive support program to enable success.

Methods: We administered a cross-sectional survey to former students who left the program from its inception in September 2014 to May 2020 to explore the extent to which program aims are being met.

Results: The response rate was 49.4% (40/81). Respondents agreed the program increased their skills, their understanding of rural healthcare issues, and enhanced their competitiveness for applying to health professional programs. Most agreed the program increased their future rural work intentions. Respondents suggested that academic programming be more flexible to allow for more varied post-program pathways.

Conclusion: This survey provides preliminary evidence the RPM Program is on track to increase the number of people with a rural affinity who prepare to become health professionals.

Résumé

Contexte : Le fait d'être issu d'un milieu rural est l'un des facteurs les plus prédictifs d'une pratique future dans un tel milieu. Toutefois, les habitants des régions rurales sont confrontés à plusieurs obstacles à l'accès à l'éducation postsecondaire. Les initiatives de parcours pré-professionnels en milieu rural sont une solution potentielle à ce problème. Le programme Rural Pre-Medicine (RPM) du Selkirk College, en Colombie-Britannique, a été conçu pour fournir aux étudiants les crédits nécessaires pour faire une demande d'admission en médecine et dans d'autres programmes de formation professionnelle en santé, une introduction aux enjeux des soins de santé en milieu rural et un programme de soutien unique et complet pour favoriser la réussite.

Méthodes : Nous avons mené une enquête transversale auprès d'anciens étudiants ayant quitté le programme entre septembre 2014, année de sa création, et mai 2020 pour déterminer dans quelle mesure les objectifs du programme sont atteints.

Résultats : Le taux de réponse a été de 49,4 % (40/81). Les répondants ont reconnu que le programme leur avait permis d'améliorer leurs compétences, de mieux comprendre les enjeux liés aux soins de santé en milieu rural et de rendre plus compétitive leur candidature aux programmes de formation professionnelle en santé. La plupart d'entre eux ont déclaré que le programme les avait confortés dans leur intention de travailler en milieu rural. Ils ont recommandé de rendre le cursus plus souple pour permettre des débouchés plus variés pour les diplômés.

Conclusion : Les résultats de cette enquête semblent indiquer que le programme RPM permettrait d'augmenter le nombre de candidats à un métier de la santé attirés par le milieu rural.

Introduction

Having a rural background and exposure to rural healthcare during training are among the most important factors in whether someone chooses to practice rurally.^{1,2} People from rural areas face barriers to accessing post-secondary education compared to their urban counterparts, including a lack of role models, lower levels of educational attainment within the family and community, fewer academic and extracurricular opportunities, and economic disadvantages.^{3,4} One solution is to introduce supportive rural pathway initiatives earlier in the educational process. The RPM Program is a 90-credit (3-year) pre-professional program that provides an early introduction to rural healthcare issues.⁵ The program has a unique, comprehensive non-academic support component that includes regular one-on-one check-ins, development of professional and learning skills, mentoring, and preparation for admissions to health programs including interview and standardized test training. Students obtain an Associate of Science (AS) degree after two years, and the Advanced Diploma in Rural Pre-Medicine (ADRPM) if they complete a third year.

The program goal is to increase the number of students with a rural affinity¹ who are preparing for careers as health professionals. Specific aims are to enable students to develop academic qualifications and non-academic skills needed during training, gain an understanding of rural healthcare, be competitive when applying to professional programs, and consider a future rural career. To better understand if the program is meeting these aims, we sought the perspectives of former students. We had four objectives:

1. Estimate the importance of rural education,
2. Estimate the program's contribution to skill development, understanding of rural healthcare practice, and competitive applications to professional health programs,
3. Describe post-program pathways and future rural intention,
4. Gain an understanding of program experiences.

Methods

As part of a broader pragmatic mixed-methods program evaluation,⁶ we administered an anonymous cross-sectional survey to all students who completed or withdrew from the program from its inception in September 2014 to May 2020. Survey questions consisted of multiple choice and Likert-type statements ranked on a 5-point scale from *strongly disagree* to *strongly agree*, as well as open-ended questions about program experiences. To maintain anonymity and increase response rate, a Survey Monkey[®] link was provided and no personal identifiers collected. Some questions were posed only to AS and ADRPM completers. To capture multiple post-program applications, participants were asked separately about applications to medical school, other health professional programs, and health-science-related degrees. Finally, the survey had questions about specific program content not reported here. The program evaluation was approved by Selkirk College's Research Ethics Board (#2021-012).

Data analysis

We calculated response rates for the whole group and program completion subgroups. We used Chi-square analysis to check for between-group differences and calculated frequencies, proportions, and 95% confidence intervals (binomial exact calculations). Analysis was done with Microsoft[®] Excel[®] for Microsoft 365 MSO (Version 2211) and Sample Size Calculators⁷ for confidence intervals.

The first author used conventional content analysis to analyze open-ended, qualitative data.⁸ Codes were refined and grouped as broader categories and subcategories based on discussion among all authors.

Results

We invited 81 former students and 40 (49.4%) responded. Table 1 displays response rates by overall group and subgroups; the AS and ADRPM response rates were significantly higher than the total group and the Incomplete group was significantly lower. Thirty-three (33/40; 83%) respondents identified as coming from a rural background versus six (6/40; 15%) not rural and one (1/40; 3%) non-respondent (data not displayed).

¹Our working definition of *rural affinity* is those who identify as having a rural background, and those from larger centres who are attracted to a rural lifestyle.

Table 1. Response rates

	Invited # (%)	Responded # (%)	Response rate by group	Chi-Square (p-value)*
Incomplete	46 (56.8%)	11 (27.5%)	23.9%	12.5 (.0004) ^s
AS	8 (9.9%)	7 (17.5%)	87.5%	4.5 (.03) ^s
ADRPM	27 (33.3%)	21 (52.5%)	77.8%	7.3 (0.007) ^s
Not Answered		1 (2.5%)		
Whole Group	81 (100.0%)	40 (100.0%)	49.4%	

*Individual goodness-of-fit tests comparing observed responses to expected responses based on Whole Group response rate; s=significant at $p < .05$

Table 2 displays frequency counts, proportions, and 95% confidence intervals for the multiple choice and Likert-type statements, grouped by study objective (See Appendix A).

Rural education

Of the AS and ADRPM respondents, 44% (12/27) agreed/strongly agreed they are “pursuing a career in health care because the RPM Program was available in my community.” Eighty-one percent (22/27) would want to spend at least half of their education in a rural setting.

Skills, rural understanding and applications

All respondents were asked to categorize their future academic and career intentions, and 85% (33/39) reported they intend to continue “further education related to the RPM Program.” Most AS and ADRPM graduates agreed the program increased their skills; responses ranged from 93% who agreed/strongly agreed there were improvements in their interview skills to 78% in agreement their writing skills had improved. AS and ADRPM graduates were asked about post-RPM applications (data not displayed). Of the ADRPM respondents, 17/21 (81%) applied to medical school, 15/21 (71%) applied to health sciences programs, 5/21 (24%) applied to other health professional programs, and 4/21 (9%) applied to non-health-related programs. Of those who applied to medical school, 11/17 (65%) reported being invited to interview and 7/17 (41%) reported receiving an offer of acceptance. Of those who applied to other health professional programs, 3/5 (60%) reported being accepted. More AS respondents applied to health science degree programs (5/7; 71%) than to medical school (1/7; 14%), other health professional programs (2/7; 29%), or non-health related programs (1/7; 14%).

Rural intentions

Sixty-three percent (63%) agreed/strongly agreed “RPM increased the likelihood that I will work, study, or live in a rural area in the future.”

Program experiences

Student experiences derived from open-ended qualitative data were categorized as RPM context and student learning and growth. In terms of *RPM context*, it was described as a specialized program, in a small community, offering small class sizes with good access to faculty, and with a wide variety of extra support for students. Several respondents reported that they appreciated the small class sizes as it allowed for better access to faculty, additional support, and the ability to make personal connections with staff. Others reported having challenges making connections. Respondents from all three completion groups indicated a desire for greater flexibility or course selection within the program and more formalized post-program pathways and transfer options.

In the *learning and growth* category, respondents wrote about learning within a small cohort, adapting to high workloads, experiences with student support and non-academic programming. RPM was described as a competitive program with a heavy workload. Students adapted by developing skills in time management, self-care, and work-life balance. Some reported becoming more well-rounded and self-reflective. Conversely, some adapted less well and reported high stress, “drowning in hard sciences,” time burden, and feeling depleted. Community experiences and non-academic programming such as field trips, hospital visits and health professional guest speakers were highly valued to gain insight into potential future careers.

Discussion

Responses from former students suggest the RPM Program is on track to prepare more people with rural affinities to become health professionals. Suggestions for program improvements from students who withdrew early and from graduates largely focused on making the academic programming more flexible to allow for multiple pathways to a wide variety of health professions.

A 2020 meta-analysis of pathway programs concluded rural background and rural experience during training were independently associated with an increased likelihood of rural practice for general practitioners, and the effect of multiple factors may be cumulative.¹ The RPM Program capitalizes on the accumulation of factors while also filling a gap by providing a pathway program at the pre-professional level, where few others exist. Most respondents indicated they would not have attended if such a program did not exist locally. Thus, the program may

not only plant seeds about rural careers in those already considering healthcare but may further increase numbers by attracting students who would not otherwise have initiated post-secondary education.

Most respondents reported an intention to work rurally and return, at least part-time, to their home region. The RPM Program may enhance rural intention through its focus on factors identified as important in the “ruralization” of health professionals’ horizons: preparation and support, rural lifestyle, and socialization.⁸ While it is too early for most former RPM students to know where they will eventually work, evidence from other programs suggests rurally focused training leads to more rural healthcare professionals. A study of practice locations of the Northern Ontario School of Medicine’s first class found an increased likelihood of graduates working in the same or similar regions.⁹ A study from rural Alabama demonstrated a correlation between the number of students who participated in pre-professional pathway programs in specific counties and the number of health professionals who returned to work there.¹⁰ The RPM Program has the potential to have a long-term positive impact on rural health human resources.

Limitations

The survey was anonymous to improve response rate and forthrightness of answers, but this approach did not allow identification of specific cohorts to see how responses changed as the program evolved, or to get specific information about population subgroups (e.g., Indigenous students). The response rate from people who did not complete the program was low, and that group was not asked all survey questions. The results remain relevant, as the open-ended questions included insights from students who withdrew, largely related to increasing the flexibility of the academic program. Additional research that builds on these findings and seeks input from students who withdrew early, as well as subgroups of students (e.g., Indigenous), will be important for efforts to improve retention and overall program experience.

Conclusion and future directions

Former students perceive the RPM Program is increasing rural access to a health professional preparatory program, increasing relevant skills and knowledge, improving the competitiveness of health professional program applications, and developing future rural work intentions. As a result of recommendations from this survey, the program designed curriculum changes that allow for

increased flexibility for students. These come into effect in Fall 2024. A multi-faceted long-term program evaluation is underway to better understand factors impacting retention, monitor program quality, and understand how best the program can play a role in increasing rural, remote, and Indigenous healthcare access. The program evaluation also includes a follow-up survey administered to former students 3, 6, and 9 years after leaving the program, to monitor post-program academic and career pathways.

Conflicts of Interest: The authors have no conflicts of interest to declare.

Funding: This research is unfunded.

Acknowledgements: Financial and development support for the RPM Program was received from British Columbia’s Joint Standing Committee on Rural Issues, the Columbia Basin Trust, and the Kootenay Boundary Division of Family Practice. The Selkirk College RPM Program faculty and Ashley Engel, Institutional Research, contributed to the development of the survey.

References

- Ogden J, Preston S, Partanen RL, Ostini R, Coxeter P. Recruiting and retaining general practitioners in rural practice: systematic review and meta-analysis of rural pipeline effects. *Med J Aust.* 2020; 213(5):228–36. <https://doi.org/10.5694/mja2.50697>.
- Asghari S, Kirkland M, Blackmore J, et al. A systematic review of reviews: recruitment and retention of rural family physicians. *Can J Rural Med.* 2020;25(1):20-30. https://doi.org/10.4103/CJRM.CJRM_4_19.
- Rourke J. Strategies to increase the enrolment of students of rural origin in medical school: recommendations from the Society of Rural Physicians of Canada. *Can Med Assoc J.* 2005; 172(1):62–5.
- Whalen D, Harris C, Harty C, Green A., Faour E., Thomson K, Ravalia M. Should I apply to medical school? High school students and barriers to application. *Canadian Journal of Rural Medicine.* 2016; 21(2):46-50. PMID: 26986684.
- McEwen S, Larsen T, Lund E, Vanderhoek J. Supported rural pre-medicine: a descriptive evaluation of a novel undergraduate program’s first cohorts. *Can Med Ed J* 2021;12(6):114-6. <https://doi.org/https://doi.org/10.36834/cmej.72358>.
- Crane M, Bauman A, Lloyd B, McGill B, Rissel C, Grunseit A. Applying pragmatic approaches to complex program evaluation: a case study of implementation of the New South Wales Get Healthy at Work program. *Health Promot J Austr.* 2019; 30(3):422–32. <https://doi.org/10.1002/hpja.239>.
- Kohn M, Senyak J. Sample Size Calculators [website]. UCSF CTSI. 2021. Available at <https://sample-size.net/confidence-interval-proportion/> [Accessed on January 13, 2023]
- Hsieh H-F, Shannon SE. Three approaches to qualitative content analysis. *Qual Health Res.* 2005; 15(9):1277-1288 <https://doi.org/10.1177/1049732305276687>.

9. Smith T, Cross M, Waller S, Chambers H, Farthing A, Barraclough F, et al. Ruralization of students' horizons: insights into Australian health professional students' rural and remote placements. *J Multidiscip Healthc*. 2018;11:85–97. <https://doi.org/10.2147/JMDH.S150623>.
10. Hogenbirk JC, Strasser RP, French MG. Ten years of graduates: a cross-sectional study of the practice location of doctors trained at a socially accountable medical school. *PLoS One*. 2022;17(9):e0274499. <https://doi.org/10.1371/journal.pone.0274499>.
11. Wheat JR, Leeper JD. Pipeline programs can support reforms in medical education: a cohort study of Alabama's rural health leaders pipeline to engage community leaders. *J Rural Health*. 2021;37(4):745–54. <https://doi.org/10.1111/jrh.12531>.

Published ahead of issue

Appendix A.

Table 2. Frequency counts, proportions, and 95% confidence interval for Likert statements and multiple-choice items

Rural education								
I am pursuing a career in health care because RPM was available in my community (n = 27)	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	N/A	Desirable Answer	95% CI
	7 (26%)	5 (18%)	5 (18%)	5 (18%)	4 (15%)	1 (4%)	12 (44%)	.25 - .65
If it were up to you, how much of your education would you like to pursue in a rural setting? (n = 27)	A lot (> half)	As much as possible	About half	A little (<half)	As little as possible	Prefer not to answer		
	6 (22%)	6 (22%)	10 (37%)	4 (15%)	1 (4%)	0 (0%)	22(81%)	.62- .94
I feel that attending a college in a rural setting helped me succeed along my educational pathway (n = 27)	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	N/A		
	11 (41%)	11 (41%)	3 (11%)	1 (4%)	1 (4%)	0 (0%)	22 (81%)	.62- .94
Skills, rural understanding, applications								
I have skills such as communication skills, analytical thinking, and leadership skills that will help in my future career (n = 27)	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	N/A	Desirable Answer	95% CI
	10 (37%)	12 (44%)	4 (15%)	0 (0%)	0 (0%)	1 (4%)	22 (81%)	.62- .94
I have improved interview skills (n = 27)	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	N/A		
	14 (52%)	11 (41%)	2 (7%)	0 (0%)	0 (0%)	0 (0%)	25 (93%)	.76-.99
I have improved writing skills (n = 27)	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	N/A		
	8 (30%)	13 (48%)	6 (22%)	0 (0%)	0 (0%)	0 (0%)	21 (78%)	.58-.91
I am better prepared to write a standardized test as part of an admission process (e.g., MCAT®) (n = 27)	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	N/A		
	10 (37%)	12 (44%)	2 (7%)	2 (7%)	0 (0%)	1 (4%)	22 (81%)	.62- .94
I have a better understanding of the urban-rural differences in health care such as differences in health services, lifestyles, etc (n = 27)	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	N/A		
	12(44%)	12 (44%)	2 (7%)	1 (4%)	0 (0%)	0(0%)	24 (89%)	.71-.98
I have a greater appreciation for the unique characteristics of rural compared to urban practice, e.g. greater emphasis on generalist vs specialist practice (n = 27)	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	N/A		
	9 (33%)	14 (52%)	3 (11%)	0 (0%)	0 (0%)	1 (4%)	23 (85%)	.66-.96
I have a better understanding of the benefits of being a health practitioner in a rural area such as deeper connections with patients (n = 27)	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	N/A		
	8 (30%)	15 (56%)	3(11%)	0(0%)	1 (4%)	0 (0%)	23 (85%)	.66-.96
I have a better understanding of the challenges faced by health practitioners in rural areas such as working in isolation (n = 27)	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	N/A		
	14 (52%)	10 (37%)	2 (7%)	0 (0%)	0 (0%)	1 (4%)	24 (89%)	.71-.98
I am better equipped to work appropriately and effectively with members of different cultural traditions (n = 27)	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	N/A		
	8 (30%)	14 (52%)	4 (15%)	1 (4%)	0 (0%)	0 (0%)	22 (81%)	.62- .94
I have a deeper understanding of Indigenous ways of knowing and being (n = 27)	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	N/A		
	11 (41%)	14 (52%)	1 (4%)	1 (4%)	0 (0%)	0 (0%)	25 (93%)	.76-.99
I am a more competitive applicant to professional health programs	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	N/A		
	9 (33%)	11 (41%)	5 (18%)	2 (7%)	0 (0%)	0 (0%)	20 (74%)	.54-.89

because of the academic programming in RPM (i.e. courses) (<i>n</i> = 27)								
I am a more competitive applicant to professional health programs because of the non-academic programming (e.g. MMI prep) (<i>n</i> = 27)	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	N/A		
	10 (37%)	9 (33%)	6 (22%)	0 (0%)	2 (7%)	0 (0%)	19(70%)	.50-.86
Rural Intentions								
RPM has increased the likelihood that I will work, study or live in a rural area in the future (<i>n</i> = 27)	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	N/A	Desirable Answer	95% CI
	8 (30%)	9 (33%)	7 (26%)	3 (11%)	0 (0%)	0 (0%)	17 (63%)	.42-.80
If you did spend your future career in a rural community, would your intention be to (<i>n</i> = 23)	Return to home community	Mixture of time in home community and other	Move to another rural community	Undecided				
	10 (43%)	3 (13%)	2 (9%)	8 (35%)			13 (56%)	.34-.77
How much of your future career would you like to spend in a rural community (not just in British Columbia, anywhere in the world) (<i>n</i> = 26)	All my future career in rural	majority of my future career in rural	Undecided	Majority of my future career urban	All my future career in urban			
	3 (11%)	12 (46%)	8 (31%)	3 (11%)	0 (0%)		15 (58%)	.37-.77
We are interested in your future education or career plans. What do you intend to do in the near future? (<i>n</i> = 39)	Continue ED related to RPM	Continue further ED not related to RPM	Seek employment related to RPM	Seek employment not related to RPM				
	33 (85%)	5 (13%)	1 (3%)	0 (0%)			33 (85%)	.69-.94

Published ahead of time