Interventions to improve recruitment and retention of physicians in rural and remote Canada: A systematic review

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ABSTRACT

Introduction: Rural and remote regions of Canada struggle to attract and retain an adequate healthcare workforce to provide the healthcare needed by their local residents. The purpose of this systematic review is to explore current literature that has analyzed strategies for recruitment and retention of physicians to rural and remote regions in Canada.

Methods: Scopus and PubMed were searched for articles. To be included in the review, the titles yielded from the initial search had to be in English and meet one of the inclusion criteria: (1) address rural and/or remote healthcare, (2) focus on medical students or physicians, and (3) discuss recruitment or retention strategies. Titles were excluded if they discussed non-OECD countries or were not original journal articles. The final sample of articles were analyzed by both reviewers for content and emerging themes.

Summary of Results and Conclusion: The initial search yielded a total of 3397 titles for review. After applying criteria described above, 35 articles remained for review. A variety of recruitment and retention themes were identified targeting physicians before, during, and after their medical education. The most effective strategies consistently appear to be those aimed before medical education, specifically admitting medical students who have a rural background. This review aims to provide a summary of the currently available research to assist with evidence-based decision making to increase supply and retention of rural physicians.

Keywords: rural medicine; physician recruitment; physician retention; primary care

INTRODUCTION

Rural and remote regions of Canada struggle to attract and maintain an adequate healthcare workforce to provide for local residents. The 2016 Canadian census reported that 16.8% of the population lived in rural areas,¹ while only 8.2% of the country's physicians practiced outside urban centres.² Numerous interventions have been attempted in order to resolve this issue with varying degrees of success.^{3,4} In order to guide these interventions, many studies have been performed to determine which factors lead physicians to practice rural medicine.^{3,5,6}

This systematic review explores the current literature assessing barriers to the recruitment and retention of rural physicians as well as strategies used to attract medical students and physicians to rural

and remote regions within Canada. The purpose of this review is to provide Canadian governments, hospitals, and medical schools with a summary of current research to assist with implementation of evidence-based strategies aimed to increase the supply and retention of rural physicians.

METHODS

The search was performed using two databases: Scopus and PubMed. The authors (CL, JG) collaborated to build the search strategies for each database (Appendix 1 & Appendix 2).

Two reviewers screened the citations using the following inclusion criteria: the article was available in English, the title belonged to an original research article, and the article was studying an OECD nation. Additionally, the title had to display relevance to one of the following three search categories: (1) a focus on rural, regional, or remote geography, (2) the main group being studied consisted of medical trainees or physicians, or (3) the title demonstrated a focus on the recruitment or retention of medical personnel. The initial 50 titles were assessed for interrater reliability, while the remaining articles were screened by each reviewer independently.

A similar process was applied to the articles undergoing abstract review. The two authors independently applied inclusion and exclusion criteria to the first 50 abstracts. These criteria were the same as those applied to the titles with the added change that abstracts must contain all three of the search categories instead of just one. The remaining abstracts were divided between the two reviewers.

In an effort to narrow the scope of this review and to ensure its relevance to current Canadian populations, full articles were reviewed for the following: 1) published in the year 2000 or later, and 2) focus on Canadian populations. After applying the same procedures used previously for the initial 50 full-text articles, the remaining articles were screened by the reviewers independently.

RESULTS

The initial search yielded a total of 3397 articles (Figure 1). After applying these criteria to the first 50 titles, the reviewers had 92% agreement ($k = 0.839$). 1790 papers were excluded, leaving 1607 that proceeded to abstract review.

Screening of the first 50 abstracts yielded 94% agreement ($k = 0.840$), resulting in a remaining 212 articles that underwent full article review. After full-text review of the first 50 titles, the

Figure 1: Summary of search results

authors showed 95% agreement ($k = 0.899$). 52 articles were included and analyzed for content and emerging themes.

Several themes emerged (Table 1): interventions targeted before, during, and after the formal medical education of physicians.

A multitude of factors that contribute to rural and remote regions' struggles to attract and retain physicians were identified. Difficulties in the work environment included feeling professionally isolated without specialist and allied-health resources that are usually available in urban centre,⁷⁻¹⁰ poor access to continuing medical education,^{7,11} and having a large workload with significant time on-call.^{7,12,13} Many physicians find their spouses struggling to find work and enjoy their rural environment,^{7,12,14-20} and others struggled with privacy and confidentiality in the small-town environment.¹²

Before receiving medical education, physicians' intention to practice rurally^{7,21} and having a rural background²⁰⁻²⁸ were found to be significantly associated with future rural practice. During medical education, rural clinical experiences increased the likelihood of future practice.^{7,12,20-23,26,27,29-35} After physicians completed their medical education, a variety of interventions targeted them. These included access to specialists via telemedicine,^{8,33} access to quality continuing medicine education,^{17,27,32,33,36,37} having quality community resources,¹¹ and having appropriate work-life balance (eg limiting call to a maximum of one call shift every five days).^{15,37}

Other qualities that made rural practice more appealing to physicians included developing connections to the

Table 1. Emergent themes from full article review

Before Medical Education	During Medical Education	After Completion of Medical Education
+Select students for medical school from a rural background +Select students for medical school with intent to practice rurally +Perform outreach to students in rural areas	+Rural training and learning experiences during residency +Positive rural experience during medical education +Exposure to strong rural mentorship +Access to high quality continuing medical education (CME) +Financial incentives to practicing rurally	+Access to telemedicine supports +Provisional licensure to foreign trained physicians +Working in a community with good cultural and educational resources +Having positive professional relationships with specialist and generalist colleagues +Being able to have good work life balance +Access to high quality continuing medical education (CME) +Financial incentives to practicing rurally -Personal life factors -Rural work environment (e.g. isolation, high workload)

Note: "+" denotes an intervention positively affecting recruitment and retention, while "-" denotes a negative impact

community^{13,33,38} and community appreciation.^{7,15,38} Another way to address the lack of rural physicians was recruiting international medical graduates and foreign-trained physicians.^{39,40} A study of provisional licensure of foreign-trained physicians showed that they tended to remain in rural practice at a rate comparable with Canadian-trained physicians.³⁹ Finally, financial incentives have

been shown to improve recruitment and retention of rural physicians before,⁴¹ during,^{34,35} and after medical education.^{7,12,13,17,18,20,33,37}

DISCUSSION

This review provides a summary of the currently available research on strategies that have been used in Canada to recruit and retain physicians in rural and remote areas. These interventions ranged from targeting students prior to their acceptance into medical school, to strategies focusing on staff physicians who had completed their medical education.

The majority of the strategies reviewed focused on recruiting physicians after they had finished their training through use of financial incentives despite strong evidence that earlier intervention is a more effective approach.⁴² For example, early interventions before and during medical education are the basis of the admissions process and the structure of the undergraduate and postgraduate programs structure of the Northern Ontario School of Medicine (NOSM). NOSM gives admissions preference to students from rural Northern Ontario and requires a nine-month clinical rotation in a rural Northern Ontarian community. As of 2010, 70% of NOSM graduates chose to train in family medicine, with 67.5% of NOSM's Family Medicine Residency graduates practicing in Northern Ontario or other rural communities.²² This demonstrates the success of early interventions in achieving an increase in the number of locally practicing family physicians. Moreover, a study from Western University has shown that rural exposure during residency training rotations may increase the number of residents who ultimately choose to practice in a rural area.²⁹ Additionally, strategies aimed at attracting fully trained physicians after they have completed their training, such as financial incentives, have shown good short-term efficacy but poor long-term.⁴³ Unfortunately, the majority of the interventions reviewed in this article fall into this category.

This systematic review has several limitations. Though we narrowed the scope of our search to include only articles pertaining to Canada to ensure relevance to our research question, interventions conducted in other countries may have provided additional insight, though the differing rural demographics would present challenges for interpretation.

This review provides an overview of existing strategies that have been attempted to attract physicians to working in rural and remote environments in Canada. Future areas of research should focus on methods to improve equity throughout the medical school admissions process for students who grew up in a rural or remote environment. Additionally, many of the articles in this review lacked measures of the interventions' efficacy. Future studies should obtain measures of the impact their intervention had on long-term retention rates to provide a strong basis for larger scale interventions. Lastly, there are valuable lessons to learn from approaches other countries have taken in addressing the difficulties of recruiting and retaining physicians in non-urban areas. Additional study of methods used in countries facing similar issues may provide new insight.

APPENDIX 1. SCOPUS SEARCH STRATEGY

(TITLE-ABS-KEY (“medical student” OR “medical school” OR “medical education” OR “health student” OR “medical care” OR physician OR “medical trainee” OR “healthcare trainee” OR “health care trainee” OR “clinical school” OR “clinical placement”) AND TITLE-ABS-KEY (“rural health care” OR “rural healthcare” OR “rural population” OR “rural area” OR rural OR “medically underserved area” OR “rural medical workforce” OR “remote area” OR “rural exposure” OR “rural track”) AND TITLE-ABS-KEY (“health care planning” OR “health care need” OR “medical student recruitment” OR “physician supply” OR “retention” OR “recruitment” OR “physician retention” OR “physician recruitment”)) AND (LIMIT-TO (DOCTYPE , “ar”) OR LIMIT-TO (DOCTYPE , “re”)) AND (LIMIT-TO (SRCTYPE , “j”))

APPENDIX 2. PUBMED SEARCH STRATEGY

Rural population[mesh terms] OR rural health services[mesh terms] OR rural health[mesh terms] OR hospital, rural[mesh terms] OR rural[all fields] AND Student, medical[mesh terms] OR physicians[mesh terms] OR “medical student”[all fields] OR physician*[all fields] AND Retain[all fields] OR recruit[all fields] OR retent*[all fields] OR intent*[all fields]

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