

ORIGINAL RESEARCH

Exploring rural medical education: a study of Canadian key informants

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ABSTRACT:

Introduction: Recruiting and retaining primary healthcare professionals is a global healthcare problem. Some countries have been using medical education as a strategy to aid in the recruitment and retention of these healthcare professionals. The purpose of this study is to engage with key informants and explore the learning processes that support medical students to prepare for a rural career.

Methods: Seven key informants with extensive experience in rural medical education participated in semi-structured interviews. The interviews were audio-recorded and professionally transcribed. Transcripts were analyzed using thematic analysis.

Results: Four key themes were identified. Respondents discussed

Keywords:

Canada, medical education, medical students, rural education, rural recruitment.

the different ways they conceptualized 'rural'. Informants suggested that relationships could either be barriers or facilitators to rural practice and that certain educational strategies were necessary to help train students for rural careers. Finally, informants discussed different characteristics that rural physicians need.

Conclusion: The finding of this study suggests that preparing students for rural practice requires a multifaceted approach. Specifically, using certain educational strategies, pre-selecting or developing certain characteristics in students, and helping students develop relationships that attach them to a community or support working in a rural community are warranted.

FULL ARTICLE:

Introduction

Health inequities as a result of geographic location persist across the world. Individuals living in rural areas are generally less healthy than individuals living in more urban areas^{1,2}. Reliable comprehensive primary health care can help to close this gap. However, the short supply of these healthcare workers in rural areas has been an ongoing issue. For example, almost 20% of all Canadians live in rural or remote communities, while only 14% of family physicians are considered rural health professionals³ and similar results have been found in the USA⁴. To address the lack of available rural health services and prevent further health inequities, it is critical to focus on the challenge of recruiting and retaining family physicians in medical schools.

In Canada, there are no standardized requirements for applying to medical school. Instead, each school has unique requirements that may include certain scores on the medical college admission test, reference letters, a specific grade-point average, an autobiographical sketch, essay response questions, or an interview process. After completing an undergraduate degree in medicine, students enter a matching process where they may have to submit reference letters, test scores, a curriculum vitae, a personal letter, or complete an interview. They are then matched to a specific residency and, upon completion of the residency and associated exams, they can then practice as a licensed physician⁵. Most rural physicians practice family medicine, characterized by a broad scope of practice and a commitment to community needs³. Often described in terms of relationality, patient-centeredness, complex practice, and holistic care^{6,7} generalist medicine has often struggled against specialist medicine, which is seen as more prestigious and attractive⁸. As a result, in 2016 a collaborative taskforce was convened to look at the evidence for advancing rural medicine in Canada and develop recommendations: a Rural Roadmap for Action³. While policy, access, and research recommendations were all listed, the call to advance educational practices to improve rural competencies was identified as a priority recommendation.

Over the past two decades, researchers in nursing, social work, and medicine have been working to articulate rural competencies that are developed through education⁹⁻¹¹. This work builds from the idea that health professionals wishing to practice in low-resource, underserved communities, or who see a diverse patient base, may encounter challenges that require additional skills and attitudes. Internationally, Canada, Australia, and the USA have contributed to this literature by defining contextual and clinical competencies for rural physicians^{3,12,13}. Most recently, Longenecker et al (2018) re-examined their list of rural competencies through a national survey in the USA. While adaptability, living with scarcity and limits, resilience, integrity, reflective practice, and collaboration and community responsiveness had been identified as domains of rural competence in the first survey in 2015–2016, redoing the study brought to light new domains, comprehensiveness and agency/courage¹². To identify strategies for cultivating rural interest in medical schools, Thach et al (2018) conducted 20 interviews with medical schools in four different countries. While developing rural competence was identified as a key strategy, the study provided limited insight into how to develop this competence – a common gap in the literature¹⁴.

While competence is a key focus of the medical education literature, insight can also be gleaned from the field of professional identity. For example, recent studies have found that developing a rural identity is integral to developing a rural physician identity, which contributes to a rural affinity¹⁵. Such work has identified key factors that contribute to the development of a rural identity in medical school, such as rural roots and positive rural exposure in undergraduate and postgraduate medical education. Additionally, literature that examines the non-bioscientific knowledge required in medical training could provide pedagogically useful ways for teaching the underpinnings of rural competence¹⁶. Ultimately, to prepare students for rural life and leadership, there is a need to better understand the complex factors that contribute to the development of non-medical rural competencies, attitudes, and identities within local programs but within a national landscape.

In Canada, socially accountable medical schools (medical schools reoriented towards addressing priority health needs) have been identified as a key path for improving the inequitable distribution of physicians in Canada^{17,18}. These socially accountable medical schools represent an effort to move past small-scale recruitment and retention efforts (ie singular rural placements) in rural settings towards system-level upstream thinking with the potential for greater impact. With a growing number of socially accountable medical schools in Canada and beyond, and early evidence that such schools are positively impacting their rural health systems, published research that examines how to effectively prepare medical students with the competencies, attitudes, and identities to practice in rural settings is needed¹⁹.

The social accountability mandate in association with the complexity of rural medical education leads to our current research question: what are the learning processes that support medical students to prepare for a rural career? With an increasingly urgent demand for rural physicians, this paper can inform researchers, medical school administrators, and policymakers about effective educational strategies to prepare future physicians for rural careers.

Methods

Participants were recruited through relevant Canadian networks (National Medical Education Research Center Directors Network, the National Social Accountability Network within Association of Faculties of Medicine of Canada, and the Society of Rural Physicians of Canada) and a snowball sampling recruitment technique was used by asking initial participants for any other potential participants they would recommend. Participants were selected or recommended based on their affiliation with rurally focused medical institutions or their expertise in rural medical education. Prior to participation in the study, respondents were sent a letter of information and a list of potential questions, and key informants were invited to provide any relevant documentation related to rural medical education. These materials were reviewed before the interviews to allow for questions related to specific processes and learning outcomes. Basic demographic information was collected at the start of the interview (gender, role, years in medical education). The final sample consisted of seven in-depth interviews with medical educators and institutional leaders from across Canada.

Data collection

A semi-structured phone interview guide was designed to prompt a conversation around learning processes and outcomes in rural medical education. The interview guide was based on a literature review on educational strategies used to effectively prepare students for rural careers. Each interview lasted 30–45 minutes, and all participants gave informed consent before taking part in the study. Some of the questions/requests were 'Describe the educational strategies that your program is using to effectively prepare students for rural careers', 'What are the qualities of students that go on to have successful rural careers?', 'What are the most important factors in preparing students for rural

careers?', 'What are the internal and external barriers for students taking on rural careers?', and a question asking interviewees if they felt anything else was relevant or needed to be added to the conversation. Immediately after each interview, detailed field notes were taken describing the moderators' initial reactions, quality of data, and other general feelings.

Data analysis

Key informant interviews were audio-recorded, professionally transcribed, and anonymized. After each interview, the researcher-recorded field notes were added to each transcription. A thematic analysis was conducted using successive rounds of coding and following the general steps proposed by Braun and Clarke (2006)²⁰. The researcher immersed themselves in the data by both listening and reading through the interviews and transcripts. The first read and listen were used to gain familiarity with the data. During the second read, the researcher proceeded to develop codes and subthemes by examining specific words, phrases, or sentences. From the initial codes, the researcher generated the first iteration of an evolving codebook. A second member of the research team confirmed the codes. After this process, the researcher grouped codes to create and define themes. Finally, the themes were named and defined²⁰. To maintain rigor the following strategies were used: multiple researchers, data sources and theoretical triangulation, purposive sampling, detailed field notes and audit trail²¹.

Ethics approval

Ethics submission was approved Lakehead University Research Ethics Board (ROMEO # 1467737), in compliance with the Helsinki Declaration.

Results

The key informants included four males and three females with an average of 22 years of experience in medical education. Affiliations included site director, associate professor, professor, and chief of surgery. Key informants were asked about medical education approaches to help prepare students for rural careers. In the data, four main themes were selected: framing rural teaching matters, anchoring relationships for all, resilience and suffering as lenses for rural teaching and learning, and recruiting and retaining the right learners. The following section will describe each theme with quotes from the interview. The names associated with each quote have been replaced with a pseudonym.

Theme 1: Framing rural teaching matters

Discussions on how the informants conceptualized 'rural' started most of the interviews. Informants admitted that defining and conceptualizing 'rural' is a constant challenge, but the programmatic designations can be separated based on three defining features: geography, population size, and type of medical practice. One of the geographic definitions consisted of 'anything outside of urban centres' (Jessica). Some informants used population size as one informant said, 'For me rural is basically anything under about 15 000' (Amy) while another informant

(Ryan) used anything less than 20 000 people. Some informants also referred to a programmatic designation based on the type of medical practice in the community, as one informant said:

To me rural depicts more of a practice pattern than a population size. And so communities in which the medical services are predominantly provided by primary care physicians where they cover the emergency room, do hospital care, ambulatory care, nursing homes, you know all that sort of thing, to me a rural pattern practice. (Chris)

The participant further explained this by re-iterating that a designation of 'rural' could encompass a practice where the primary care physician provides the bulk of the service and physicians lack access to 'the full range of laboratory services, the CT and MRI scans and all sort of the bells and whistles.' (Chris)

Theme 2: Anchoring relationships for all

The interviews with the key informants revealed that having or developing relationships in the community were potential facilitators or barriers to rural practice. For example, having established relationships (friends, family, or community) or bringing relationships to a rural community (partner, colleague) were identified as facilitators. These relationships were identified as important to ground physicians in the community, as one informant said:

And I think you know it is hard, we've had ... physicians join our practice, you know as single physicians without any real connection to the community and without any family in town and I think it's really hard to establish a rural career without kind of having some type of, something that anchors you. And so I think the people that are the most successful were the ones that establish really strong relationships and it doesn't have to be kind of a partner relationship but something that connects them to the community and to the people in the community. (James)

Relationships also came up in the context of rural exposure. It was identified that rural exposure in medical training is important for all students because it allows students (particularly non-rural students) to develop rural relationships and deepen their understanding of the rural context. In particular, it was identified that, when students are finally in practice, those that practice in non-rural areas will have a better understanding and be more supportive of what rural colleagues faced:

And so that's really the important thing because not only is it teaching people who will never work in rural sites what it is to be rural, but they also get a chance to see the struggles. So that when they are attendees, when they are practicing if they get a call from a rural colleague they won't be like 'uhhh why are you calling me? Oh my god I don't want to talk to you' because they'll understand what it's like to be isolated and be in an environment where you are resource limited. (Whitney)

Theme 3: Resilience and suffering as lenses for rural teaching and learning

The key informants highlighted the importance of learning that takes place in and with rural communities. The opportunities identified were predominantly in the form of longitudinal integrated clerkships or other shorter educational placements in rural settings that combined important doing, reflection, and action cycles. When asked about educational strategies that work for preparing students for rural careers, one informant emphasized, 'I think there's sort of three basic things. Experiential learning, experiential learning and experiential learning' (Allan). While rural exposure was deemed important it was the focus on experiential learning, particularly intentional contextualized learning, that embedded reflection and action, which were important ingredients for rich teaching and learning opportunities. Key informants elaborated on the importance of these intentional contextualized experiences and how they can expose the strengths and resilience of rural medicine and reduce urban bias. For example, as one informant explained:

Well, I think one of the big elements of that is the integration of the students into the community, so they get a real sense of understanding what it means to be a real practitioner in a rural area by getting involved in the events of the town. (Whitney)

Informants specifically identified how intentional contextualized learning can help address some of the negative attitudes about rural practice and rural medicine. As described by one participant, rural medicine is not often treated with the same respect as urban-based medicine and so these opportunities can help address this issue:

To be honest, I think that the most important thing for any school trying to educate students is to keep the academic bias out of your education program because it creates a very negative perception of rural medicine. So many of the doctors that we have teaching in the university settings are very focused on university settings like big city medicine and maybe not representing their rural colleagues in the best light. (Whitney)

This was reiterated when another informant said:

... the rural practitioners or the rural focused student really suffers because I've had students told they would never be allowed to teach if they were rural or be allowed to research if they were rural. (Ryan)

Another informant described the importance of intentional contextualized learning so students can understand disease beyond just its biomedical components towards more contextualized and community-based understanding of disease:

You almost are required to see the sufferer, that is the patient, that's the origin of the word, the sufferer in the context in which they live. Not only within their spousal relationships, not only within their family, but within what one might call their neighbourhood and are thereby, by virtue of the kinds of folks suffering with various things, are in a sense required to

contextualize their alcoholism, to contextualize their broken bone even, to be confronted with the social determinants of health. (Allan)

The role of suffering was mentioned by several participants, and it was used to refer to a deepening understanding of rural medicine and the conjoint contextual endurance of both patients and health professionals. For students, to be witness to both the shared resilience and suffering was felt to provide a rich teaching and learning environment for learners and opened up doors for enhanced preparedness within the rural context that provides rich experiential learning opportunities.

Theme 4: Recruiting and retaining the right learners

Finally, informants spent time describing the specific attributes that they felt medical students need to have successful rural careers. Based on the seven participants, four specific attributes were identified: independence, confidence, social accountability, and the ability to understand team dynamics.

- Independence was discussed as exploring and taking on new and exciting opportunities as compared to other learners who may prefer the comfort of staying at home in a predictable and comfortable environment:

... they're the independent learners. They're the ones that have had experiences in life that give them more resilience or they're more likely to be the rational risk takers, going out and seeing how the community works rather than staying at home and insisting on their Starbucks. (Ryan)

- Confidence encompassed an ability to apply your knowledge in different scenarios that may not have been taught in a classroom or clinical setting:

So you have to be willing to step out on a limb and say yeah I've never done that before but I think I can do it because I've got the basic skill sets to do so. (Whitney)

- Social accountability was framed as having a service ethic. Students had to understand medicine as a field where you are motivated to help others: 'You have to be willing to serve others. You know it's a place where you can't be self-centred' (Jessica). The social accountability aspect was further described by another informant:

Well the internal barriers is students coming in without having a service ethic. We did a study on our students on the first six months after they entered and it was just one class but only about 15% of the class knew medicine as a service profession, the rest came in with the idea it was either science or a means to an end for themselves. (Ryan)

- Understanding team dynamics covered that you had to be both a leader and a team player. As one informant said, 'I'd add leadership training because in rural areas you're often on all the committees or you know the leadership roles that need to be filled now are by us' (Jessica). However, a different informant said:

Thinking of yourself as more of team player than as a leader which in a lot of cases surgeons are sort of taught to expect that they're the top of the food chain which in rural communities doesn't usually happen. You have to learn to work with less capable assistants, so you have to be innovative. (Whitney)

Discussion

The present analysis suggests that preparing medical students for future rural careers relies on a complex interplay between developing and/or relying on supportive relationships, medical school learning strategies, and individual characteristics. Key informants discussed the importance of developing relationships that can ground you in the community as well as the importance of having relations with others who understand and can be supportive of the uniqueness and challenges of rural practice. In addition, there was evidence that some of the learning strategies used in medical education were important for preparing students for rural careers but that they need to go beyond rural exposure to intentional contextualized learning. Finally, informants identified specific attributes that rural physicians should already possess and/or need to develop to have a successful career as a rural physician. These results suggest that multi-faceted approaches that target the development of specific character traits or attributes, rural placements, and consider factors beyond medicine are warranted to prepare students for rural careers.

In describing the meaning of being rural, informants used common categorizations of population size and geographic location, but one uncommon usage was a programmatic designation based on the type of practice. Using a programmatic designation based on type of practice might help to elucidate certain findings, but it will continue to be limited by certain types of measurement bias. While no definition of rural will adequately appease all stakeholders, the continued absence of a consistent programmatic designation may limit the usefulness of work being done in rural medical education. Future research needs to incorporate the different viewpoints of key informants and create a common understanding of 'rural'.

As has been presented in previous literature, key informants mentioned that having supportive relationships was crucial for preparing students for rural careers²². The relationships do not need to take a specific form (eg romantic, friendship, or familial), but they need to anchor someone to the community – the stronger the relationship, the stronger the attachment. New physicians need these supportive relationships to help anchor individuals in the community and combat loneliness until a new social support network can be formed. Living in a rural area can be

challenging as it has been described as isolating and lonely²³. However, educational strategies have been shown to be successful in helping reduce feelings of loneliness²⁴. These strategies should be incorporated into rural medical education. It was also suggested that this firsthand rural experience would improve professional networks between physicians practicing in rural and non-rural areas. For example, urban physicians with rural exposure in their medical training might be more willing to collaborate with a rural colleague as they would understand the challenges their rural colleagues were facing. Another strategy that medical schools have used that has shown some success is selecting applicants who grew up in a rural community³. It is possible that these students go back to the rural community where they grew up and already have anchoring relationships.

What can be concluded from the data is that a rural experiential learning opportunity was a necessity to prepare students for rural careers. The importance of these placements has been described at length in the literature^{3,25,26}. However, the key informants in this study provided much richer descriptions of the benefits of their placements that move beyond the simplistic idea that 'practicing here will prepare you to work here.' For example, one informant discussed that one of the significant elements of rural experiential learning happened outside the hospital. These discussions highlighted that students needed to become part of the community to best understand what it meant to be a rural practitioner through reflection, and action cycles. More importantly, the key informants drew an important link between experiential learning and teaching productive suffering in rural contexts imbued with strength and resilience. In other words, students need to bear what others suffer to understand fully how suffering works in the context of its existence to develop compassion and deep understanding for the role of place in medicine²⁷.

A sense of place and belonging are important aspects of rural medical practice, but when medical students enter rural communities, they are often primarily focused on developing important clinical skills and researching various illnesses or diseases, making it difficult to establish a sense of belonging^{28,29}. It is critical that students engage with the rural communities during their placement and reflect on these rural experiences. This deeper level of engagement and the development of a sense of belonging is often connected to place-based learning theory. Place-based learning argues that education should be for and about somewhere³⁰. Ross et al (2020) describe the five dimensions of place-based education in a rurally focused medical school. To engage with all five dimensions, students must spend time in the community. For example, as part of the political dimension students need to understand community healthcare needs and engage in advocacy. This learning can only be done through community engagement and not learned by reading a textbook³¹. To encourage future rural practice, medical education needs to ensure educators understand place-based learning theory and move community integration from the hidden curriculum into the curriculum by having direct learning objectives to allow students in rural communities the time and motivation to develop a sense of

belonging. A similar suggestion was made by Ross et al (2019) in their work examining medical students and preceptors who take part in community experiential placements³² and by Thach et al (2018) in their work interviewing program administrators in the USA, Canada, Australia and South Africa¹⁴.

This study also finds that some of the key informants had to counter a deficit model of rural medicine as students had already negatively framed rural medicine before they had a chance to work in a rural area. For example, a study on metropolitan students taking a rural health module suggested that students had negative preconceived notions about living and practicing in a rural area. These fears included clinical isolation and small-town living³³. This deficit is potentially compounded as most rural physicians specialize in family medicine, which is seen as a less prestigious type of medical practice⁷. The key informants from the present study suggested that, in some instances, negative perceptions stemmed from the urban campus where they were trained, thus arguing for the need for intentional contextualized learning in rural contexts to reduce urban bias. While much has been written about the impact of positive and negative framing³⁴, if students are coming into rural placements with perceptions that rural practice is deficient in some ways, it may be difficult to change their attitudes or opinions over the course of a short experiential placement. Rural medical professionals need to be included in the leadership, research, and teaching staff at medical schools so students can see that rural physicians are important and valued within the healthcare system. Additionally, rural medical education needs to be framed using a strength-based approach so students are familiar with the unique opportunities that only rural medicine can offer.

Researchers have suggested potential characteristics that rural physicians need to be successful. Longenecker et al (2018) identified adaptability, agency and courage, collaboration and community responsiveness, comprehensiveness, integrity, abundance in the face of scarcity and limits, reflective practice, and resilience as rural competency domains²⁰. Similarly in the present study, key informants suggested that being a team player and confidence were important characteristics for rural physicians. One unique factor identified was social accountability. One medical institution, the Northern Ontario School of Medicine (NOSM), was established on a social accountability mandate and the school is dedicated to improving the health of people living in Northern Ontario. This definition was further described at a clinical level by two rural doctors from NOSM in a digital storytelling project where they discussed taking on additional learning based on emergent health issues in their rural community³⁵. NOSM has seen positive results in preparing students for rural careers, and part of this success can be attributed to their focus on social accountability³⁶. NOSM implements social accountability in their medical training by selecting students who come from rural, remote, Aboriginal, or francophone communities and using a distributed medical education model where learners are taught in rural communities and where they can understand social determinants of health at the local level³⁷. There is potential linkage between social accountability and what Longenecker et al (2018) identifies as

community responsiveness as they all share a similar principle of doctors pushing themselves to meet the needs of their community. However, in Longenecker's work this gets tied in with collaboration, whereas in the present study social accountability was a defining characteristic. With many schools taking on the challenge of becoming socially accountable, future longitudinal research is needed on understanding the relationship between students' characteristics at entry to medical school (recruitment characteristics) or changes in characteristics during medical school (ie during training), and retention (practice in rural locations)^{17,18}.

This study identified various factors that are important to incorporate into the learning process when preparing medical students for rural careers. One key limitation of this study is that interviews were only conducted with university-affiliated informants. A discussion paper by Strasser and Strasser (2020) suggested that the most successful models of education and training include community engaged education³⁸, the present study could be missing the community voice. As seen in the theme of 'suffering', community engagement can add to the voice by enduring a full understanding of rural practices; community-

engaged education submerges the learners in the rural contexts of health to develop the necessary passion and compassion for comprehensive care.

Conclusion

This study suggests that preparing students for rural careers is a multifaceted process influenced by many factors including interpersonal relationships, medical education curriculum, and personal characteristics. To address these factors in medical education, there is a need to continue to refine the selection process based on certain characteristics (ie social accountability), be more intentional about the use of place-based learning, and create learning outcomes that are related to the known challenges of rural living. Some of these factors have been identified in published literature; however, most previous studies have reduced these factors into simplistic cause-and-effect models. To build on this research and embrace the complexity of preparing students for rural careers future research, complex systems theory could be used. This theory is garnering attention in the medical education field and could help in improving understanding of how to support medical learners in their preparation for rural careers.

REFERENCES:

- 1 DesMeules M, Pong R, Lagace C, Heng D, Manuel D, Pitblado R, et al. How healthy are rural Canadians? An assessment of their health status and health determinants. *Community Health* 2006; 1-182.
- 2 Pong RW, Desmeules M, Lagacé C. Rural–urban disparities in health: how does Canada fare and how does Canada compare with Australia? *Australian Journal of Rural Health* 2009; **17(1)**: 58-64. DOI link, PMid:19161503
- 3 Bosco C, Oandasan I. *Review of family medicine within rural and remote Canada: education, practice, and policy*. Mississauga, ON: College of Family Physicians of Canada, 2016.
- 4 Rosenblatt RA, Hart LG. Physicians and rural America. *Western Journal of Medicine* 2000; **173(5)**: 348. DOI link, PMid:11069878
- 5 The Association of Faculties of Medicine of Canada. *Future MD Canada*. Available: web link (Accessed 12 December 2021).
- 6 McWhinney IR. The importance of being different. *British Journal of General Practice* 1996; **46(408)**: 433-436.
- 7 Rainsberry P, Nasmith L, Weston WW, Busing N, Fowler N, Goertzen J, et al. The times, are they a-changin'? *Canadian Family Physician* 2018; **64(11)**: 798-800.
- 8 Creed PA, Searle J, Rogers ME. Medical specialty prestige and lifestyle preferences for medical students. *Social Science and Medicine* 2010; **71(6)**: 1084-1088. DOI link, PMid:20674118
- 9 National Rural Health Association. *Graduate medical education for rural practice*. 2008. Available: web link (Accessed 6 May 2022).
- 10 O'Sullivan D, And DR, Young S. A framework for the use of competencies in rural social work field practice placements. *Australian Social Work* 1997; **50(1)**: 31-38. DOI link
- 11 Hurme E. Competencies for nursing practice in a rural critical access hospital. *Online Journal of Rural Nursing and Health Care* 2009; **9(2)**: 67-81. DOI link
- 12 Longenecker RL, Wendling A, Hollander-Rodriguez J, Bowling J, Schmitz D. Competence revisited in a rural context. *Family Medicine* 2018; **50(1)**: 28-35. DOI link, PMid:29346700
- 13 Australian College of Rural and Remote Medicine. *Rural generalist curriculum*. 2021. Available: web link (Accessed 6 May 2022).
- 14 Thach SB, Hodge B, Cox M, Parlier-Ahmad AB, Galvin SL. Cultivating country doctors: preparing learners for rural life and community leadership. *Family Medicine* 2018; **50(9)**: 685-690. DOI link, PMid:30307586
- 15 Parlier AB, Galvin SL, Thach S, Kruidenier D, Fagan EB. The road to rural primary care: a narrative review of factors that help develop, recruit, and retain rural primary care physicians. *Academic Medicine* 2018; **93(1)**: 130-140. DOI link, PMid:28767498
- 16 Kuper A, Veinot P, Leavitt J, Levitt S, Li A, Goguen J, et al. Epistemology, culture, justice and power: non-bioscientific knowledge for medical training. *Medical Education* 2017; **51(2)**: 158-173. DOI link, PMid:27862175
- 17 Boelen C, Pearson D, Kaufman A, Rourke J, Woollard R, Marsh DC, et al. Producing a socially accountable medical school: AMEE Guide No. 109. *Medical Teacher* 2016; **38(11)**: 1078-1091. DOI link, PMid:27608933
- 18 Murray RB, Larkins S, Russell H, Ewen S, Prideaux D. Medical schools as agents of change: socially accountable medical education. *Medical Journal of Australia* 2012; **196(10)**: 1-5. DOI link, PMid:22676883

- 19** Hogenbirk JC, Timony PE, French MG, Strasser R, Pong RW, Cervin C, et al. Milestones on the social accountability journey. *Canadian Family Physician* 2016; **62**: 138-145.
- 20** Braun V, Clarke V. Using thematic analysis in psychology. *Qualitative Research in Psychology* 2006; **3**: 77-101. DOI link
- 21** Baxter J, Eyles J. Evaluating qualitative research in social geography: establishing 'rigour' in interview analysis. *Transactions of the Institute of British Geographers* 1997; **22(4)**: 505-525. DOI link
- 22** Cameron PJ, Este DC, Worthington CA. Professional, personal and community: 3 domains of physician retention in rural communities. *Canadian Journal of Rural Medicine* 2012; **17(2)**: 47-55.
- 23** Hays RB, Veitch PC, Cheers B, Crossland L. Why doctors leave rural practice. *The Australian Journal of Rural Health* 1997; **5(4)**: 198-203. DOI link, PMID:9444118
- 24** Lindsay EK, Young S, Brown KW, Smyth JM, Creswell J. David. Mindfulness training reduces loneliness and increases social contact in a randomized controlled trial. *Proceedings of the National Academy of Sciences of the United States of America* 2019; **116(9)**: 3488-3493. DOI link, PMID:30808743
- 25** Worley P, Prideaux DJ, Magarey A, Strasser RP, Silagy CA. Why we should teach undergraduate medical students in rural communities. *Medical Journal of Australia* 2000; **172**: 615-617. DOI link, PMID:10914111
- 26** Rourke J. WHO recommendations to improve retention of rural and remote health workers – important for all countries. *Rural and Remote Health* 2010; **10(4)**: 1654. DOI link, PMID:21105750
- 27** Ross BM, Daynard K, Greenwood D. Medicine for somewhere: the emergence of place in medical education. *Educational Research and Reviews* 2014; **9(22)**: 1250-1265.
- 28** Dyrbye L, Shanafelt T. A narrative review on burnout experienced by medical students and residents. *Medical Education* 2016; **50(1)**: 132-149. DOI link, PMID:26695473
- 29** Cameron PJ, Este DC, Worthington CA. Physician retention in rural Alberta: key community factors. *Canadian Journal of Public Health* 2010; **101(1)**: 79-82. DOI link, PMID:20364544
- 30** Sobel D. *Place-based education: connecting classrooms and communities*. Great Barrington, MA: Orion, 2004.
- 31** Ross B, Cameron E, Greenwood D. Remote and rural placements occurring during early medical training as a multidimensional place-based medical education experience. *Educational Research and Reviews* 2020; **15(3)**: 150-158. DOI link
- 32** Ross BM, Cameron E, Greenwood D. A qualitative investigation of the experiences of students and preceptors taking part in remote and rural community experiential placements during early medical training. *Journal of Medical Education and Curricular Development* 2019; **6**: 238212051985931. DOI link, PMID:31286059
- 33** Bourke L, Wright J. Perceptions of rural practice among metropolitan medical students undertaking a rural health module. *MedEdPublish* 2015; 1-7. DOI link
- 34** Tversky A, Kahneman D. The framing of decisions and the psychology of choice. *Science* 1981; **211(4481)**: 453-458. DOI link, PMID:7455683
- 35** Cheu H, Strasser R. *NOSM digital stories: group competency community, adaptiveness and clinical courage*. 2020. Available: web link (Accessed 6 May 2022).
- 36** NOSM University. *Social accountability: addressing the priority health concerns of Northern Ontario*. 2018. Available: web link (Accessed 15 January 2021).
- 37** Strasser R, Hogenbirk JC, Minore B, Marsh DC, Berry S, McCready WG, et al. Transforming health professional education through social accountability: Canada's Northern Ontario School of Medicine. *Medical Teacher* 2013; **35(6)**: 490-496. DOI link, PMID:23496120
- 38** Strasser R, Strasser S. *Reimagining primary health care workforce in rural and underserved settings*. 2020. Available: web link, DOI link (Accessed 6 May 2022).

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