

**Factors that Influence Canadian Physician Assistants to Practice Rurally:
A Survey Response**

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Abstract

A shortage of healthcare professionals is considered to be a driving force behind access barriers in rural Canada. The use of Physician assistants (PAs) as healthcare providers in remote areas can help mitigate this shortage. There is currently no research available on rural Canadian PAs to assess factors that influence the choice to practice rurally. This study examined specific factors influencing currently practicing rural Canadian PAs to choose their rural practice. This study also assessed whether a rural upbringing or participating in a rural rotation positively related to choosing to practice medicine rurally.

This is a cross-sectional descriptive study conducted through an electronic survey. The primary outcomes of this study included examining the significance of 12 factors on the choice to practice rurally as well as whether completing a rural rotation or having a rural upbringing significantly correlated to rural practice.

The top three factors most significantly influencing a PAs decision to practice rurally were (1) increased level of autonomy, (2) type of practice, (3) scope of practice. There was a positive relationship between having a rural upbringing and practicing rurally ($X^2 (1, N = 61) = 30.47, p < .001$). There was no relationship between completing a rural rotation and practicing rurally.

It concluded individuals are more likely to choose rural practice if they had a rural upbringing. Canadian PA schools wishing to increase recruitment and recruitment to rural services can use the above results. Prospective employers can also use the above results to help attract more PAs to rural opportunities.

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Introduction

Canadian Healthcare – Rural versus Urban

Rural Canadians often encounter a lack of access to adequate healthcare services in their communities. The shortage of primary care physicians and other healthcare professionals may contribute to the barrier of obtaining healthcare in remote areas (1). Although rural Canadians constitute one-fifth of Canada's population, only 8% of physicians practicing in Canada serve rural communities (2). Moreover, in a 2018 Canadian study, it was further found that there was a threefold gap in physician numbers as well as twice as many nurses when comparing urban to their rural counterparts (3). These significant differences in the

distribution of healthcare workers promote several health disparities that exist between rural and urban Canadians.

The rural population in Canada is older, less affluent, have higher death rates and shorter life expectancies than urban Canadians (1,2). Similarly, a 2006 study demonstrated that rural Canadians typically were of lower socioeconomic status, obtained less education and exhibited poor health behaviours. More specifically, rural residents were found more likely to be overweight, smoke, and have higher blood pressures than their urban counterparts (3,4).

Many initiatives have started in an attempt to increase recruitment and retainment of family physicians and other healthcare professionals in rural areas. Some of these strategies include providing student loan forgiveness for primary care physicians and nurses for those choosing to practice rurally (5). The vast majority of provinces in Canada also provide monetary incentives or bonuses for physicians that opt to practice in a remote community (6,7,8). Additionally, there is also the University of Manitoba International Medical Graduate (IMG) Program that requires a return of service in rural and northern Manitoba (9). Another proposed strategy to mitigate the imbalance in the availability of healthcare workers in remote communities would be to maximize the use of non-physician providers such as physician assistants.

History of Physician Assistants

In the United States, the physician assistant (PA) profession began in the 1960s to help combat the shortage of physicians in the country. PAs are medically trained professionals that practice medicine within a formalized relationship with physicians to deliver quality healthcare to patients (10). PAs perform medical histories and physical exams, order diagnostic tests, develop and manage treatment plans, as well as prescribe medications (11). In Canada, PAs were formally introduced in 1984 by the Canadian Armed Forces (12). The Province of Manitoba introduced PA Regulations in 1999 with the first licensed PAs beginning practice in 2003. Currently, approximately 750 certified PAs are practicing in Canada within a variety of specialties.

Rural Physician Assistants in the United States

In the United States, PAs are viewed as a way to increase access to care in rural areas. According to the American Academy of Physician Assistants in 2017, one in eight PAs worked in a rural location, and one in three rural PAs practice primary care (13). Multiple American studies report the expanded scope of rural PA practice as one of many contributing factors influencing job satisfaction and choice of practice location.

The Journal of Rural Health in 2011, published that PAs are a cost-effective solution to increasing access to care in underserved areas (14). One of the main incentives of employment for PAs in remote areas was a broader scope of practice when compared to their urban counterparts (14). Other significant factors that influenced PAs to choose rurally included a strong desire to serve the needs of the smaller community, the type of practice and the characteristics of the supervising physician (15, 16). Support for the PA's significant other and their possible spousal opportunities held the most weight when deciding where to practice (17). Moreover, the strongest predictor of job satisfaction of a rural PA was related to community

satisfaction (16). Contrarily, particular concerns that negatively influenced job satisfaction included the lack of educational opportunities and isolation from peers that PAs faced in remote communities. Many rural practicing PAs felt that they often had to go outside of their formal scope of practice to meet the needs of their patients. This responsibility was taxing to the PA's sense of role (14). Other studies also looked at the possible association between having a rural upbringing and ultimately choosing to practice medicine rurally. In 2012, Smith, Muma, Burks, and Lavoie presented that a PA's rural upbringing was more likely to contribute to practice in a rural setting than those that did not (17).

Purpose of the Study

In the wake of the current shortage of primary health care professionals in rural areas, PAs will play a significant role in providing health care services to underserved populations in Canada. As the need for PAs in rural settings grows, it is necessary to investigate the factors that influence Canadian PAs to choose rural practice. The purpose of this study was to examine specific factors that had influenced currently practicing rural PAs to choose rural practice. Additionally, this study also served to assess whether having a rural upbringing or participating in a rural rotation is positively related to choosing to practice rurally. To the best of our knowledge, this is the first study that uses the Canadian PA population as the study population.

The significance of this study lies in its ability to inform potential employers about the perceived barriers and incentives that current PAs are encountering while working in rural areas. Moreover, the results of this study may help PA programs that wish to increase the number of graduates that practice medicine rurally. Ultimately, this will hopefully serve as a tool to increase recruitment and retainment of Canadian PAs in rural areas.

Study Objectives

The primary objective of this study is to determine the factors that influence Canadian PAs to choose to practice rurally. Another primary objective is to assess whether having a rural upbringing or participating in a rural rotation was positively related to opting to practice rurally. The secondary objectives of this study include determining the current distribution of PAs practicing in rural Canada as well as examining the areas or specialties in which Canadian PAs are practicing. Do rural PAs mainly practice in primary medicine, or do they work in other specialties?

Methods

This study used a cross-sectional, electronically distributed survey using the SurveyMonkey platform. Participants were recruited through the Canadian Association of Physician Assistant's Facebook page as well as from various provincial PA Facebook pages. Additional recruitment of participants through the Canadian Association of Physician Assistants email list occurred, targeting PAs with their CCPA designation. Non-certified PAs were excluded from the survey.

The survey's initial question asked the respondent to confirm their CCPA designation. The second inquired about whether the participant had a rural, suburban or urban upbringing. As the definition of rural in Canada is often dependant on the varying ages of the respondents and upbringing, self-classification was chosen as the best method to employ. This self-classification method has also been used

widely in many similar studies in the United States (14,18). The questionnaire then asks whether the respondent participated in a rural rotation during their education as a PA student. The following question asks about the current PA's field of practice. The opening part of the survey allowed participants to self-assess whether rural upbringing and rural rotation are associated with choosing a rural location to practice as well as the current distribution of PAs that practice in Canada.

Rurally practicing respondents completed the survey's next stage and ended for those answering no to rural practice. As of 2016, Statistics Canada is using population center definitions to define the distribution of the Canadian population. Specifically, small population centers have population between 1,000 and 29,999. Therefore, for this study, rural is defined as an area that has a population of less than 30,000.

Those participants rated factors for their level of influence on the decision to practice rurally. The listed factors, adapted from findings of previous similar studies American PAs, regarded location of practice and job satisfaction, the scope of practice (14, 15), desire to serve smaller communities (14-17), proximity to family/colleagues (15, 17), income potential, the influence of spouse/partner (15, 17), level of autonomy, recreational activities and climate/geographic factors (15), characteristics of supervising physician, and availability of supervising physician (15). For each factor, the respondent used a 5-point Likert scale ranging from not influential to extremely influential. Lastly, the participants selected their level of agreement with two statements regarding their scope of practice and level of autonomy as a rural PA.

All survey responses were anonymous, and no identifying information collected from participants. A consent disclosure statement was inserted at the beginning of the survey, discussing the risks and benefits of completing the survey. The initiation and completion of the survey were considered as consent.

Statistical analysis with Microsoft Excel and Chi-square tests evaluated the relationship between rural upbringing, rural practice, rural rotations, eventual rural practice. Descriptive statistics assessed the rate of influence that each factor had on choosing to practice rurally.

Results

Of the 66 responses, two respondents not meeting the inclusion criteria were excluded, and three respondents did not complete the survey. Therefore, there were a total of 61 respondents that finished the survey and met the inclusion criteria.

Participants were asked to classify their upbringing as either rural, suburban or urban. The responses for the suburban category were added to the urban category. As demonstrated in Figure 1, 48 (78.7%) of participants stated they had an urban upbringing, whereas 13 (21.3%) had a rural upbringing.

Next, respondents identified participation in a rural rotation during their PA education. The majority of respondents (86.9%) participated in a rural rotation/clerkship, whereas only 13.1% did not participate in a rural rotation (Figure 2).

When asked about whether they practice medicine rurally versus in an urban location, only 13 (21.3%) individuals stated they currently practice in a rural location (Figure 3). As delineated in Figure 4, 100% of

individuals that practiced medicine rurally participated in a rural rotation. In contrast, 83% of individuals that practice in an urban setting also completed a rural rotation. There is no significant statistical relationship identified between rural rotations and current rural practice as less than five rural practice respondents did not complete a rural rotation, insufficient numbers for Chi-Square comparisons.

Moreover, 10 (76.9%) out of the 13 individuals that practice medicine rurally identified having a rural upbringing (Figure 4). A chi-square test of independence examined the relationship between practicing medicine rurally and having a rural upbringing. The relation between these variables was significant, $X^2(1, N = 61) = 30.47, p < .001$. Therefore, individuals who had a rural upbringing were more likely to practice medicine in a rural location than those identified as having an urban upbringing.

Respondents identified which field of medicine that they currently work in (Table 1). 21.3% of participants work in primary care, 18% work in a subspecialty, 16.4% work in surgery, 16.4% also work in emergency medicine, 13.1% work in internal medicine, 4.91% work in pediatrics, an additional 4.91% work in psychiatry, 3.28% work in hematology/oncology and 1.6% work in addictions medicine. Looking at those that practice rurally, the majority (38.5%) practice in emergency medicine, 30.8% practice in family medicine, 15.4% practice in internal medicine, and 15.4% practice in surgery (Figure 5).

Individuals that answered yes to practicing medicine in a rural location completed the second part of the survey and asked to rank the level of influence of several factors on their choice to practice medicine in a rural location (Figure 6). The factors rated as not at all influential on their choice to practice rurally were climate or geographic factors (53.9%), next income potential (46.2%), and the third access to educational facilities/resources. In contrast, the factor that was most rated as very or extremely influential and had the most impact was level of autonomy (84.6%), followed by the nature of the practice (69.2%), then the scope of practice (61.5%).

Next, the rural practicing respondents rated their level agreement with two statements. The first statement was, "I feel that I have more autonomy as a rural practicing PA" of which 76.9% of participants agreed or strongly agreed, whereas 23.1% rated the statement as having a neutral opinion (Figure 7). No participants chose to disagree or strongly disagree with the first statement. The second statement, "I feel that I have a broader scope of practice as a rural practicing PA," had eight respondents (61.5%) stating agreement with the statement and the remaining five respondents (38.5%) strongly agreeing (Figure 7). No respondents picked the neutral, disagree or strongly disagree options regarding this statement.

Discussion

Initially, military Canadian PAs were trained as physician extenders and provided healthcare to individuals on field deployments, remote postings, and rural locations such as ships and sea or remote postings (19). As the profession continued to evolve in Canada with the development of civilian PA programs, more PAs worked in urban settings. Given the significant health disparities existing between rural and urban Canadians and the shortage of rural healthcare professionals, revisiting the idea of PAs as a possible solution to this complex issue should be further considered.

In assessing Canadian PA population demographics, the majority of PAs are raised primarily in an urban setting and complete rural rotations in their educational training. Moreover, this study found that 21.3% of

Canadian PAs respondents practiced in a rural location or 1 in 5. Study findings indicate that those raised in a rural setting were significantly more likely to practice medicine in a rural setting. These results are consistent with several American PA studies (15, 17). Given the findings, Canadian PA schools could place more weight on the admission of rural applications or rural upbringing. This is one way to increase rural PAs in Canada. Also of note, all of the current rural practicing PAs completed a rural clerkship during their PA education. With that said, a statistically significant relationship could not be found between participating in a rural rotation and practicing rural medicine. The causality could not be assessed within this study as rural PAs were not asked to assess the level of influence that a rural rotation played in impacting their decision to practice rurally.

The top three popular fields of practice among Canadian PAs include primary care (21.3%), followed by subspecialty (18%) and then emergency medicine (16.4%). Despite more PAs seeming to find employment within subspecialty areas, primary care remains to be a top contender in the type of practice for Canadian PAs. Of those PAs that work rurally, the most common areas of practice include emergency medicine (38.5%) and primary care (30.8%). These results lend support to the idea that PAs can be an effective strategy to combat the shortage of healthcare providers in rural settings in both emergency and primary care medicine.

PA research in the United States reported the most significant factors influencing the decision to practice in a rural location include the scope-of-practice; a desire to serve the needs of a smaller community; the type of practice opportunity; spousal opportunities; as well as the characteristics of the supervising physician (15-17).

The results of this study revealed that the top three factors influencing PAs' decision for rural practice were the level of autonomy (84.6%), followed by the type of practice (69.2%) and then the scope of practice (61.5%). Results further established that 100% of rural PAs strongly agreed/agreed to having a broader scope of practice compared to their urban counterparts. 76.9% of rural PAs agreed or strongly agreed that they have more autonomy than an urban practicing PA.

For future studies, it may be helpful to create a specific scale or questionnaire to objectively measure the scope of practice to validate whether rural PAs have a broader scope of practice and more autonomy than their urban counterparts.

As the more popular PA practices in Canada include primary care and emergency medicine, and that the scope of practice significantly influence the decision to work rurally, creating more primary care/emergency roles may attract more PAs to work in a rural setting. As the number of working PAs in Canada continues to increase, Governments and Health Authorities should look at creating jobs in primary care and emergency care for rural locations to address needs. Ensuring PAs working in rural locations are satisfied with the level of autonomy may increase the retainment of PAs. Another method that may aid in recruitment would be to publicize that rural PAs felt that they had a broader scope of practice and more autonomy than their urban counterparts.

Contrary to previous studies completed, our respondents were distributed evenly between not influential and extremely influential for factors such as a desire to serve a smaller community and influence of

spouse/partner. Supervising physician characteristics and availability were moderately influential among rural PAs as the majority of respondents rated it between somewhat influential to extremely influential. To support the retainment of rural PAs it would be useful to know what specific physician characteristics have the highest impact on their decision.

The factors rated as the least influential for Canadian PAs included climate and geographic, income potential, and access to educational facilities. Income potential is one of the lowest influential factors in the rural recruitment of PAs reported. There is no published information lending evidence to the fact that rural PAs have a higher starting salary or receive any financial incentives such as loan forgiveness. Perhaps creating financial incentives for PAs similar to those that are available to physicians and nurses, may help prospective employers increase recruitment too much needed rural areas.

Study Limitations

This pilot study attempts to understand what influenced the choice of Canadian PAs to practice medicine in a rural location. The ultimate goal of this study was to gather results that aided Canadian employers in attracting PAs to rural locations as well as to help Canadian PA programs that wish to increase the number of graduates that practise rurally. This research study should be considered in light of study limitations.

The first limitation of this study was the low respondent rate. According to the Canadian Association of Physician Assistants, there are between 580 and 650 practicing PAs in Canada. Licensure is not a requirement in many provinces and challenging to confirm PA numbers. Given that there were only 61 respondents, there was a response rate of 10.4%. The small sample size of this study limits the analysis of the data. Given the fact that only 13 respondents identified as rural practicing PAs, the results are not necessarily generalizable to all rural practicing PAs in Canada. Considering the low respondent rate, the results of this study may not reflect the true distribution of urban vs rural PAs. Moreover, a significant chi-square analysis could not establish a link between participating in a rural rotation or clerkship and choosing to practice in a rural location. Furthermore, this study did not assess respondents' province. In knowing this, it is hard to say whether there was an inaccurate representation of data due to low provincial respondent rates.

Another limitation of the study involves the method of survey distribution through various Canadian Physician Assistants' email lists and Facebook groups. Potential participants without active email or social media interest would miss the invitation to the survey, thus contributing to a low respondent rate.

A third limitation of this study may be the definition of rural as a community of fewer than 30,000 people. The definition may have been too narrow and missed possible PAs working in smaller communities or areas. Often the definition or criteria of a rural area may not be congruent with an individual's perception of that area. As an example, some people that live in Brandon, Manitoba, may believe that it is a rural town. However, the definition employed in this study would limit involvement, given the current population of Brandon of 48,859. Moreover, the definition of a rural community in Canada is changing, and it is difficult to classify a rural community area. Perhaps a better system would have been allowing participants to self-classify if they work in a rural location or broaden the definition to allow rural as populations consisting of less than 50,000 individuals.

A fourth limitation to this study is that individuals self-identified whether they had a rural, suburban or urban upbringing. This analysis grouped the results from the suburban and the urban category together in the statistics calculations.

A fifth limitation is that only currently practicing rural PAs answered questions regarding factors that influenced their choice to practice rurally. However, we did not ask Urban PAs for their views or perceptions regarding the barriers or incentives to practicing rurally. This information would also be useful to prospective employers trying to advertise or increase recruitment of rural PAs.

A sixth limitation was excluding PAs from the United States practicing in Canada without the CCPA designation and given the strict inclusion criteria of a CCPA designation.

The descriptive and qualitative nature of the study did have limitations as the study looked at significant trends in the data as opposed to objective measurements/quantifiable results. For instance, participants rated their level of agreement with the statements of having a broader scope of practice than urban PAs. It may be helpful for future studies to delve into the details of why rural PAs agreed with the statement as well as to create an objective scale to measure the scope of practice.

Lastly, only allowing respondents to choose one option for their current field of practice may have missed the diversity of rural practice. For example, many individuals working in rural areas work as a primary care provider and provide emergency medicine or surgical support. In knowing that a PAs' scope can be multidimensional and that several PAs work in a multitude of areas, the distribution of Canadian PAs presented in the study may be inaccurate.

Future Directions

As this is the first study of its kind to assess Canadian PAs beliefs regarding rural practice, more studies are needed to replicate and validate these findings given the low respondent rate. Several studies building on the findings of this pilot study could focus on questions to the urban population to gain insight on perceived barriers to rural practice. Studying the motives of individuals leaving a rural position for an urban site and job satisfaction within the rural Canadian PA population could help increase the retainment of rural PAs. As the number of rural PAs increases in Canada, studies should assess health outcomes before and after PAs began working in their communities.

Future research looking at the demographics of the PA student population and possible relationship to the choice of practice regardless of urban or rural is needed. If all Canadian programs made it mandatory to participate in rural rotations, would that translate to an increase in the number of individuals choosing to practice rurally after graduation? It might also be beneficial to assess whether the number of years an individual spent living in a rural town is positively related to wanting to practise rurally.

Conclusion

The utilization of PAs in rural areas can help to increase access to healthcare and thus lessen the health disparities that exist between rural and urban citizens. As the PA profession continues to grow and evolve in Canada, it is crucial to determine perceived attitudes surrounding employment in rural areas.

Prospective employers can use this information to attract more PAs to rural opportunities as well as increase the retainment of PAs in rural areas.

This unique pilot study demonstrated that the most important factors that influence rural PAs include a level of autonomy, type of practice and scope of practice. More research is needed to develop objective ways to measure the scope of practice and level of autonomy between rural and urban working PAs. The factors that had the least influence on rural PAs were climate and geographic factors, income potential and access to educational facilities. Currently, there are no documented rural incentives offered to rural PAs. More research to assess further whether having rural incentives would make a rural work opportunity more attractive. Additionally, this study revealed that individuals are more likely to practice rurally if they self-identify as having a rural upbringing. Canadian PA schools wishing to increase the number of graduates that choose to practice rurally may decide to ask whether prospective applicants identify with having a rural background.

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