



Telehealth and the recruitment and retention of physicians in rural and remote regions: a Delphi study

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Introduction: The availability of a medical workforce is a growing concern for rural and remote communities across Canada. In the last decade, various telehealth experiences have highlighted the potential impact of this technology on professional as well as organizational practices. But could telehealth be a strategy to attract and maintain physicians in rural and remote communities? The objective of this study was to identify a reliable list of recruitment and retention factors on which telehealth could have an impact.

Methods: We conducted 2 literature reviews and a Delphi study among 12 telehealth experts across Canada.

Results: The literature reviews identified 7 categories of recruitment and retention factors on which telehealth could have an impact: 1) individual, 2) familial, 3) contextual, 4) professional, 5) organizational, 6) educational, and 7) economic.

Conclusions: Experts consulted through the Delphi study reached consensus on 31 out of 34 of the proposed statements about the impact of telehealth. This consensus can now be used as a conceptual model for further studies on the topic.

Introduction : La disponibilité des effectifs médicaux préoccupe de plus en plus les communautés rurales et éloignées du Canada. Au cours de la dernière décennie, diverses expériences en télésanté ont mis en évidence l'effet que cette technologie pourrait avoir sur les dimensions professionnelles et organisationnelles de la pratique. La télésanté pourrait-elle toutefois constituer une stratégie à suivre pour attirer et garder des médecins en milieu rural et éloigné? Cette étude visait à établir une liste fiable de facteurs de recrutement et de maintien en poste sur lesquels la télésanté pourrait avoir une influence.

Méthodes : Nous avons procédé à deux recensions d'écrits et à une étude Delphi auprès de 12 experts en télésanté du Canada.

Résultats : Les recensions d'écrits ont dégagé sept catégories de facteurs de recrutement et de maintien en poste sur lesquels la télésanté pourrait avoir une influence : 1) individuels, 2) familiaux, 3) contextuels, 4) professionnels, 5) organisationnels, 6) éducationnels et 7) financiers.

Conclusions : Les experts consultés dans le contexte de l'étude Delphi se sont entendus sur 31 des 34 énoncés proposés au sujet de l'influence de la télésanté. On peut maintenant utiliser ce consensus comme modèle conceptuel pour effectuer des études plus poussées sur la question.

INTRODUCTION

In Canada, issues regarding availability of, and access to, the health sector workforce are of increasing concern. Between 1993 and 2000 the number of physicians per 100 000 capita has

diminished from about 195 to 189.¹ The situation is even more worrying in remote regions, where 22% of Canadians live, but where only 10% of Canada's physicians practise.² Moreover, shortages of both general practitioners (GPs) and specialists are expected to

increase in the forthcoming years.⁵ This situation is of major concern for decision-makers as well as the general population.⁴ The Quebec Ministry of Health and Social Services is actually looking for different innovative strategies to favour the attraction and retention of physicians in remote regions. In its annual report, the Ministry identified telehealth as an effective strategy for contributing to improving the accessibility of health services in remote regions.⁵ Innovative strategies have to be developed to improve medical workforce recruitment and retention in remote regions. New information and communication technologies (ICT) could play an important role.⁶

In Quebec, as in other Canadian provinces, the last decade has seen many successful telehealth projects.⁷ Although the literature regards telehealth as a tool that can have a positive impact on several dimensions influencing recruitment and retention of the medical workforce in remote areas,⁸ it also criticizes the scarcity of convincing data related to this phenomenon.⁹ A recent study by Sargeant and coworkers¹⁰ found that telemedicine was not reported by GPs and specialists to be an important consideration in their choice of practice location, relative to other factors. The purpose of this study was to identify a reliable list of recruitment and retention factors on which telehealth could have an impact.

METHODS

Review of the literature

To meet this objective, 2 literature reviews were conducted. The first was to document factors related to the recruitment and retention of physicians in rural and remote regions. The second was aimed at determining upon which of these factors telehealth could have an impact. Several strategies were used for both reviews. First, various scientific databases were used to locate literature, including: ISI Web of Knowledge; MEDLINE, PubMed, CINAHL, ProQuest, WebSpire and HealthSTAR. The many key words used were determined by the research team and validated by a group of experts on medical workforce recruitment and retention and by telehealth collaborators to the project. The key words were related to the health care workforce in a rural and remote setting. Hand searches of the tables of contents were then performed in specialized scientific journals as well as in professional journals, ministry reports,

among others. The articles included in the 2 reviews spanned the years from 1992 to 2004, and were written in French or English.

RESULTS

Literature review on recruitment and retention of health professionals

Seven categories of recruitment and retention factors were identified through the 109 articles and reports consulted for the first literature review: individual, familial, contextual, professional, organizational, educational and economic. These categories are briefly presented below.

Individual factors

Individual factors are personal characteristics that influence recruitment and retention of physicians in remote areas. This category deals with factors such as being born and raised in a remote area;¹¹ personal values such as liking challenges;¹² career plans;¹³ and, finally, the proximity of family and friends.¹⁴ Even if sex and age have an unspecified influence on recruitment and retention, they need to be looked at more closely, since a feminization of the medical practice has been observed over the last years.¹⁵

Familial factors

Various factors of recruitment and retention are related to family. The possibilities of recruitment and retention increase if the remote region offers opportunities of employment or activities for the spouse, and educational opportunities for the children.^{16,17} Likely, conditions facilitating conciliation between work and family support the retention of physicians.¹⁶ Last, the preferences and needs of the spouse will improve recruitment and retention, if they are met.^{12,18,19}

Contextual factors

Different characteristics of the community can also influence the decision of physicians to work and stay in a remote region. For instance, the type and size of the population can influence recruitment and retention of physicians.^{15,14,20} Access to social and recreational activities also encourages their recruitment and retention.^{11,14,21} A healthier and less stressful lifestyle positively influences recruitment.¹⁸

Retention can be encouraged by the feelings of closeness to the community.²²

Professional factors

On the professional side, factors such as feelings of isolation, fatigue and stress impede retention of professionals in rural and remote regions. Opportunities for professional advancement, development and growth improve the likelihood of retention,^{14,21,23} as well as a good relationship with patients.¹⁶ Availability of support from the medical community encourages both physician recruitment and retention.^{11,19,24} Finally, professional isolation can have a negative impact on retention.²⁵

Organizational factors

Quality of work conditions, access to specialized services, possibility of working in a team, and the reputation of the institution are some of the organizational factors that encourage recruitment of physicians.^{11,25} However, limited access to resources, equipment and facilities can severely affect their retention.^{18,24}

Educational factors

Some recruitment and retention factors can be grouped in the educational category. Exposure to practice in rural and remote regions during the academic years encourages recruitment of physicians.^{26,27} In addition, access to continuing medical education²⁸ and the possibility of teaching students^{11,17} positively influence recruitment and retention.

Economic factors

The remuneration of professionals has a positive influence on recruitment.^{14,18} Additionally, the payment of loans, benefits, compensations and social advantages encourage recruitment and retention.¹⁷

Literature review on telehealth's impact

Forty articles and reports were consulted for the second literature review. They identified 34 factors of telehealth that could be related to medical workforce recruitment and retention. These factors have been grouped into the individual, professional, organizational and educational categories presented previously. Though most of the consulted literature was based on hypotheses rather than

empirical data, it gave us the possibility to establish a first list of statements on which experts could make a judgment.

METHODS

Delphi study

In order to propose a set of factors related to telehealth that could potentially influence recruitment and retention of physicians, a Delphi study was conducted. This technique compared the degree of written agreement among experts, who were not in contact at any time.²⁹ A minimum of 2 questionnaires was used to get a consensus from the experts. This type of study is excellent for obtaining opinions from experts who live and work in different geographic regions and settings. It also encourages open dialogue among experts.

Choice of experts

The aim of the Delphi study was to obtain opinions from a group of experts representing a variety of experiences and expertises. Selected experts included academic researchers in the field of telehealth, health care professionals who have been using telehealth for at least 3 years, and medical directors who have implemented telehealth in their institution for at least 3 years or more. Experts were drawn from 4 provinces: Alberta, Nova Scotia, Ontario and Quebec. A list of potential members was developed using a purposive sampling method. A purposive method is an iterative process, requiring multiple contacts with organizations (e.g., telehealth projects) to identify and successfully recruit appropriate key informants to participate in the study. Names of experts were selected from known telehealth projects and proceedings of telehealth conferences. They were chosen for their participation in telehealth projects as managers, users and researchers/evaluators.

Validation of the instrument

The 2 literature reviews were fine-tuned by a discussion of the findings with the group of experts collaborating on the project. The result was a total of 34 items to be included in the Delphi questionnaire. The questionnaire was pilot tested with 6 experts from Quebec (excluded from the Delphi study) to assess the clarity of the questions, the clarity of instructions, and adequacy of the format.

Following the pilot test, 3 items were added to the questionnaire, clarifications were brought to 15 items, and 2 items were deleted because of redundancy. Finally, participants mentioned the need to have a definition of telehealth, which we added in the instructions based on the one provided by the Table ministérielle en télésanté.²⁹ There was no suggestion for improving the presentation format. After making the required modifications, the questionnaire was translated into English and then translated back into French by an external translator, in order to ensure the validity of the translation.

Description of the study process

A first questionnaire, comprising 35 statements, was sent out by email to our targetted group of experts. The responses to this questionnaire were analyzed by team collaboration. A second questionnaire was devised that adjusted the questions with the feedback obtained. Three questions were discarded from the first questionnaire — for the similarity they had with others — and 2 were added. The final questionnaire had 34 statements (4 educational factors, 13 professional factors, 10 organizational factors, 7 individual traits) and included the degree of agreement obtained. This questionnaire was sent to the experts who answered the first one.

Analysis

Analysis of the 2 questionnaires was done together by the research team and team collaborators as a workshop. To reach consensus, a given proposition had to be approved by at least 60%, but we classified the question as having a significant impact when a consensus of 75% was obtained of the consulted experts.

RESULTS

Twelve experts were sent the first questionnaire, a sample size that is consistent with the 10–18 recommended for a Delphi study.³⁰ Nine (75%) sent back their questionnaire. Six of the experts also completed the second questionnaire.

Our analysis of the completed questionnaires showed that a consensus was obtained for 31/34 questions.

As shown in Table 1, consensus was reached for 3 of 4 educational factors as related to recruitment. As for retention, consensus was reached in

1 of the 4 factors: allowing knowledge update will favour retention. As such, none of the educational factors reached consensus for either recruitment or retention.

As presented in Table 2, experts agreed on all of the proposed statements with respect to professional factors as related to retention effects (13/13). There was consensus in 7/13 of the factors as related to recruitment effects.

A consensus was obtained that telehealth could favour both recruitment and retention by giving rural and remote specialists the opportunity to transmit more information to their colleagues in order to discuss complex cases. Experts argued about the potential telehealth effect on this factor of recruitment and retention, since it gives physicians more support, which helps keep them in the community. However, according to some of the experts, it might have more impact on family physicians than on specialists.

Similarly, the experts agreed that telehealth could favour recruitment and retention by facilitating contact with peers. Experts argued that this peer reinforcement is critical, but that it requires a system that is interoperable, easy to use, with human interfaces and connectivity for all. Experts disagreed with the statement that telehealth impedes retention, by allowing specialists to be consulted remotely. The reason given for this disagreement was that telehealth could be a real danger if it was promoted as a substitution for specialists in remote regions. Also, experts disagreed with the statement that telehealth, by increasing work complexity, impedes recruitment and retention. This disagreement is explained by the fact that if telehealth increases work complexity, physicians would not use it and would prefer using the telephone.

Table 3 shows that consensus was reached for 7/10 organisational factors for both recruitment and retention effects. Some of the highlights are as follows: experts agreed that telehealth, by creating a

Table 1. Educational factors related to telehealth utilization		
Factors	Agree / Disagree (consensus, %)	
	Recruitment	Retention
Factors that favour		
Allowing knowledge update	– (50)	Agree (67)
Improving CME	Disagree (60)	– (50)
Improving access to knowledge	Disagree (60)	– (50)
Factors that impede		
Replacing trips to CME events	Agree (67)	– (50)
CME = continuing medical education		

stimulating work environment, favours recruitment and retention of physicians; experts mentioned that this was particularly true for the educational aspects, the professional support and the expertise given by telehealth; and experts also disagreed that telehealth favours recruitment by increasing a physician's opportunity to integrate into a team and by a stimulating practice with more complex cases due to avoided transfers.

On this last statement, experts argued that to care for more complex cases, infrastructure and human resources were needed, all that making the practice more interesting.

Finally, individual factors are those personality

traits that could be related to both rural practice and telehealth utilization. According to the panel of experts, all individual traits presented as characteristics of remote physicians were also deemed important for telehealth users (Table 4). Traits for which there was the highest consensus were: liking challenges, the capacity to work in collaboration, being helpful for the community and having a facility of adaptation. Even though these results are positive, some experts noted the need for additional reflection on this aspect.

Factors for which a consensus of 75% or more was reached were classified as being more likely to have a significant impact. Then, a prioritization of

Table 2. Professional factors related to telehealth utilization		
Factors	Agree / Disagree (consensus, %)	
	Recruitment	Retention
Factors that favour		
Providing a second opinion in case of doubt	Agree (80)	Agree (100)
Giving rural and remote specialists the opportunity to transmit information to discuss complex cases	Agree (80)	Agree (100)
Diminishing the feeling of isolation	Agree (80)	Agree (100)
Supporting decision-making	Agree (80)	Agree (100)
Increasing support from colleagues	Agree (60)	Agree (80)
Maintaining natural professional networks between physicians	- (50)	Agree (75)
Reinforcing trust between treating physician and specialist	- (50)	Agree (75)
Increasing the feeling of security	- (50)	Agree (75)
Reinforcing trust between treating physician and patient	- (50)	Agree (75)
Facilitating contact with peers	Agree (60)	Agree (75)
Improving continuity of care with the presence of treating physician during patient consultation with the specialist	- (50)	Agree (60)
Factors that impede		
Allowing for specialists to be consulted remotely	- (50)	Disagree (75)
Increasing work complexity	Disagree (60)	Disagree (60)

Table 3. Organizational factors related to telehealth utilization		
Factors	Agree / Disagree (consensus, %)	
	Recruitment	Retention
Factors that favour		
Extending the variety of services available in rural and remote regions	Agree (80)	Agree (100)
Offering a complementary service that relieves rural and remote specialists	- (50)	Agree (80)
Creating a stimulating work environment	Agree (60)	Agree (80)
Increasing access to specialized tools (e.g., PACS)	Disagree (80)	Disagree (60)
Increasing physician's opportunity to integrate into a team	Disagree (75)	- (50)
Allowing contacts with university centres	- (50)	Agree (60)
Stimulating practices with more complex cases due to avoided transfers	Disagree (60)	- (50)
Projecting a positive image of the community	Disagree (60)	Disagree (60)
Factors that impede		
Increasing the complexity of cases	Agree (75)	Agree (67)
Being used as a substitute for specialists in rural and remote regions	- (50)	- (50)
PACS = picture archiving and telecommunication systems		

importance of educational, professional and organisational factors was done (Table 5). According to this prioritization, only one factor related to telehealth could have a significant negative impact on physician recruitment and retention: increasing the complexity of cases because of avoided patient transfers. Conversely, 10 factors related to telehealth are likely to have a significant positive impact on recruitment and retention of physicians in rural and remote regions.

Factors	Consensus, %
Liking challenges	100
Having the capacity to work in collaboration	100
Being helpful for the community	100
Having the facility to adapt	100
Wanting to make a difference in their patients' health	75
Being autonomous	75
Being comfortable with new technologies	75

Type of impact
Significant negative Increasing the complexity of cases because of avoided patient transfers
Negative Replacing trips to continuing medical education events
Significant positive Providing a second opinion in case of doubt Giving rural and remote specialists the opportunity to transmit more information to their colleagues in order to discuss complex cases Diminishing the feeling of isolation Supporting decision-making Extending a variety of services available in remote regions Offering a complementary service, leaving more relief to rural and remote specialists Maintaining natural professional networks between physicians Increasing feelings of security Reinforcing trust between physician and patient
Positive Increasing support from colleagues Creating a stimulating work environment Facilitating contact with peers Increasing the complexity of cases because of avoided patient transfers Allowing knowledge update Improving continuity of care with presence of treating physician during a patient's consultation with specialist Allowing contacts with university centres
*Assuming that a consensus of 75% and more means a significant impact. See Tables 1 to 4 for consensus percentages.

DISCUSSION

From this Delphi study, it is likely that telehealth could have an impact on a set of individual, professional, organizational and educational factors related to recruitment and retention of physicians in rural and remote regions. Nevertheless, this analysis has shown that even if telehealth can be seen as an asset for recruitment and retention of physicians, this technology alone cannot solve workforce shortages. With the increasing presence of information technologies in the health care system, it would be important to conduct more focused surveys on the effects of telehealth on the different dimensions of the work of physicians. To do so, theoretical and empirical foundations are needed. Hence, the elements of consensus that have emerged from this Delphi study could provide a basis to investigate the actual impact of telehealth on professional practice in the health care sector.

Limitations

The response rate was good in the first round of the consultation: 9/12 solicited experts (75%) responded to the questionnaire. However, only 6 responded to the second round. A plausible explanation for this lower response rate could be the lack of major divergences between experts' opinions, making both questionnaires rather similar. Although the number of participants was small, it can be justified by the specificity of the topic and the limited diversity of opinions on that subject. Moreover, we performed a second analysis with a focus group of 5 experts from diverse backgrounds (academic, clinical, health management) who collaborated on the research project. This gave us a broader comprehension of the observed results.

According to the commentaries given by experts in the questionnaire and during the focus group, the main ambiguity came from the extent to which the stated factors could play an important role on a physician's decision to choose to work in rural and remote regions and/or to stay there.

CONCLUSION

The consensus reached by experts consulted through the Delphi study shows the potential that telehealth could have on a set of individual, professional, organizational and educational factors related to recruitment and retention of physicians in rural and remote regions. The results from this study

can now be used as a conceptual model for further studies on the topic.

Competing interests: None declared.

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