Telemed J E Health. Author manuscript; available in PMC 2014 April 30.

Published in final edited form as:
Telemed J E Health. 2009 March ; 15(2): 195–198. doi:10.1089/tmj.2008.0070.

Integrating Scientific Evidence to Support Telehomecare Development in a Remote Region

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Abstract

This study aimed to understand how different types of knowledge have influenced the decision making process regarding the implementation of telehomecare in the organization of regional healthcare services in the Province of Quebec (Canada). A case study was conducted in order to explore how scientific evidence was integrated in the decision-making processes regarding the implementation of a telehomecare system in the Gaspésie–Magdalene Islands Health Region. A total of 14 semistructured interviews were completed with key organizational decision makers (regional managers, organization managers, healthcare professionals, and technological managers). Two researchers independently carried out data analysis, encouraging iterations and validation with study participants. The Gaspésie–Magdalene Islands Telehomecare Project is based on a technological solution named Intelligent Distance Patient Monitoring and constitutes a relevant example of the evolution of an e-health solution. Indeed, the first reports of the experiment influenced decision makers to continue the deployment of the solution. Decision makers from all groups agreed on the importance of using past experience to avoid pitfalls and ensure an optimal decision-making process. They highlighted the importance of knowledge translation between sites as well as within sites. Knowledge translation played an important part in the success of the project. Efficient strategies to transfer evidence to organizational decision making have been identified such as an end-users forum, where researchers provide support by sharing evidence with end-users and actively participate in knowledge translation.

Keywords

telehomecare; scientific evidence; Intelligent Distance Patient Monitoring

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Disclosure Statement
No competing financial interests exist.

Introduction

Although telehomecare constitutes one of the most successful applications of telehealth,[1] its diffusion to the Canadian healthcare system remains a challenge.[2] Telehomecare has been defined as "the use of electronic communication networks for two-way transfer of information and data required for medical diagnosis, treatment, consultation, and/or health maintenance between a patient's residence and a healthcare facility."[3] Little is known about factors and conditions influencing the decision-making processes related to the implementation of telehomecare in health services organizations. As with many innovations in the healthcare sector, most telehomecare implementations do not seem to build on available scientific evidence.[4,5] Thus, there is a need for better strategies supporting the utilization of evidence in the implementation of telehomecare services.

In the Province of Quebec (Canada), telehomecare presents a powerful tool to improve access to healthcare services for populations living in remote areas.[6] The telehomecare project of Gaspésie–Magdalene Islands is one of the first regional telehealth projects in Quebec that has received financial support from both provincial and regional healthcare authorities. This project is based on an innovative technological solution that allows "Intelligent Distance Patient Monitoring (IDPM)" for patients with chronic disease in their home.[7] Using a regular telephone line, a Web phone is installed in patients' homes and a secured link allows bidirectional data transmission with healthcare providers. Through this system, the patient receives a complete care plan adapted to his or her health condition. The system can also be used for patient education.

This study aimed to understand how different types of knowledge have influenced decision making processes regarding the implementation of telehomecare in the organization of healthcare services in the health region of Gaspésie–Magdalene Islands.

Methods

The study protocol received ethical approval from the Quebec University Hospital Centre. A case study[8] was carried out in order to explore how scientific evidence and other sources of knowledge were integrated into the decision making processes surrounding the implementation of the Gaspésie–Magdalene Islands telehomecare project. A critical incident analysis[9] was done to identify critical stages and key decisions that have shaped the implementation of this telehome-care project. This method has been used in previous studies on the impact of health technology assessment on political decisions.[10,11] In this study, a critical incident was defined as an event that created or could create change in the implementation of the IDPM in Gaspésie–Magdalene Islands health organization.[11] Critical incidents were first identified through activities reports of the IDPM project, minutes of the meetings of the regional board, and other documents related to the implementation of the project. Then, each critical incident identified was analyzed, using an adaptation of the Cooper and Zmud model of Information Technology implementation process.[12]

Subsequently, factors that supported or constrained utilization of scientific evidence in the decisions identified were explored through semistructured interviews with 14 decision

makers (provincial, regional, and local healthcare managers, healthcare professionals, and technological managers). Participants were purposively selected for their involvement in the critical incidents identified. Then, a contact network recruitment method was used by asking respondents to identify other key decision makers.[13] Sample size was determined through data saturation and information redundancy, i.e., recruitment ended when additional interviews did not bring new information or opinion.[13] Interviews were conducted between August and October 2007 and lasted between 35 and 69 minutes. All interviews were recorded with participants' consent and were transcribed.

A qualitative iterative strategy was adopted for data analysis, based upon the method proposed by Huberman and Miles.[14] Two researchers (MPG and JD) independently proceeded to a first codification of data by extracting general impressions and preliminary classification categories based on the analytical framework. After comparing coding categories and agreeing on a classification system with two other researchers (JPF and LL), all interview material was codified by one researcher (JD) using this system. Frequent iterations with other researchers of the team ensured consistency in coding, and feedback from study participants was encouraged to improve the validity of the findings.[15]

Results

The critical incidents analysis has highlighted the milestones of the telehomecare project. Figure 1 illustrates these events chronologically, according to the five stages of the theoretical model adapted from Cooper and Zmud.[12] The *emergence* phase relates to the setting up of the technological company, the first pilot experiments of the technology in other regions, and ends with the Health Department's decision to secure funding for the project. The *adoption* phase consists of technology implementation in the first experimentation site of the Gaspésie–Magdalene Islands region. The decision to pursue the implementation constitutes the starting point of the *adaptation* phase. At this stage, the conditions of success identified following the first experiment are set and the technological solution is implemented in three other sites. Lastly, the integration of the telehomecare project in the regional medical plan starts with the *acceptance* phase, which is currently ongoing, and whose objective is to implement telehome-care in other sites of the Gaspésie–Magdalene Islands region. This is considered as the precondition to the *routinization* phase, where telehomecare will be completely integrated in the healthcare services organization of the health region.

Analyses of interview content showed that the report on the project's activities from the initial experimentation phase has influenced decision makers in pursuing the deployment of the telehomecare solution. Stakeholders from all groups agreed on the importance of using past experiences to avoid pitfalls and to ensure an optimal decision-making process. They highlighted the importance of knowledge translation between sites as well as within sites. The preferred knowledge translation strategies identified were formal and informal exchanges with experimented users of the technology when initiating local experimentation. However, this type of "tacit" knowledge did not always meet decision makers' needs to get "scientific" information. Furthermore, participants clearly mentioned their need for scientific

evidence in some circumstances. Scientific evidence was particularly needed to support decisions at the following stages of the project: emergence, adoption, and adaptation.[12]

Two strategies were mentioned as being effective to support knowledge translation. The first strategy consisted of a knowledge broker who transmits information between company representatives, users, and managers from the health region and the healthcare organizations involved. The second strategy was the organization of a Regional Telehomecare Forum. This 1-day meeting gathered users from various sites and with different job positions, and allowed them to share their experiences. Although no 'scientific evidence' was transferred through these strategies, they seem to be interesting avenues to transfer valid and relevant knowledge to decision makers.

Also, some constraints were mentioned by respondents with respect to knowledge production and dissemination: (1) the production of evaluation reports is often requested to project leaders, which is highly time-consuming; (2) the lack of competencies in research/evaluation among small regional teams; and (3) busy healthcare professionals who do not have time to provide "research data" on top of their other tasks.

Discussion

The use of scientific evidence starts with the production of relevant knowledge. In the case of this telehomecare project, evaluation was not planned in initial funding. However, evidence was needed for future decision making regarding the diffusion of the telehomecare solution to the entire health region. In general, project leaders are not trained in research/evaluation. Moreover, knowledge production adds to the task of managers and healthcare professionals. These conditions impede the production of timely and rigorous evidence to answer information needs of decision makers. It is thus essential that research is integrated at the onset of telehomecare experimentations in order to identify relevant indicators that will be used to support future decision making.

Knowledge utilization was facilitated by the presence of a knowledge broker who fostered exchanges between all project stakeholders (researchers, users, company, and decision makers). The collaboration of an external research team facilitated the translation of scientific evidence to promote its utilization to support decision making.

The present study has some limitations. First, the critical incidents were identified mostly through the project's documents, such as minutes of the meeting and reports on activities. It is possible that other important events have been overlooked. Second, interviews relied on participants' memories of the events, which might have biased the results. However, the iterative process used in the analyses gave participants the opportunity to provide feedback on findings. Also, the qualitative approach used in this study makes it difficult to generalize findings. However, the results may be of interest to others who are considering implementing a telehomecare project supported by scientific knowledge.

Conclusions

In Quebec, as in many other countries, healthcare decision makers are increasingly interested in telehomecare as a tool for supporting accessibility and continuity of care for remote populations. However, scientific evidence on the effectiveness of telehomecare is still limited. Therefore, when evidence is available, it is critical to ensure its transfer to the various stakeholders involved in telehomecare projects. The challenge that remains is: how to provide decision makers with the information they need when they need it while having sufficient resources to ensure scientific rigor and validity.

Acknowledgments

This study is part of the research project: Integration of Evidence-Based e-Health into Practice, funded by the Canadian Institutes for Health Research. Marie-Pierre Gagnon is supported through a New Investigator grant from the Canadian Institutes for Health Research.

References

1. Britton BP, Engelke MK, Rains DB, Mahmud K. Measuring costs and quality of telehomecare. Home Health Care Manage Practice. 2000; 12:27–32.
2. Hebert MA, Korabek B, Scott RE. Moving research into practice: A decision framework for integrating home telehealth into chronic illness care. Int J Med Inform. 2006; 75:786–794. [PubMed: 16872892]
3. Advisory Council on Health Info-structure. Connecting for better health: Strategic issues. Ottawa: Health Canada; 1998.
4. Broens TH, Huis in't Veld RM, Vollenbroek-Hutten MM, Hermens HJ, van Halteren AT, Nieuwenhuis LJ. Determinants of successful telemedicine implementations: A literature study. J Telemed Telecare. 2007; 13:303–309. [PubMed: 17785027]
5. Gagnon MP, Legare F, Fortin JP, Lamothe L, Labrecque M, Duplantie J. An integrated strategy of knowledge application for optimal e-health implementation: A multi-method study protocol. BMC Med Inform Decis Mak. 2008; 8:17. [PubMed: 18435853]
6. Gagnon MP, Duplantie J, Fortin JP, Landry R. Implementing telehealth to support medical practice in rural/remote regions: What are the conditions for success? Implement Sci. 2006; 1:18. [PubMed: 16930484]
7. New IT Healthcare. [Last accessed January 2009] Intelligent Distance Patient Monitoring. www.newithealthcare.com/telehealth/monitoring/remote.htm
8. Yin, RK. Applications of case study research. Applied social research methods series. Newbury Park, CA: Sage Publications; 1993.
9. Kaufmann M, Staender S, von Below G, Brunner HH, Portenier L, Scheidegger D. Computerized anonymous declaration of critical incidents: A contribution of patients' safety [in French]. Bull Méd Suisses. 2003; 84:346–350.
10. Granados A. Health technology assessment and clinical decision making: Which is the best evidence? Int J Technol Assess Health Care. 1999; 15:585–592. [PubMed: 10874384]
11. Jacob R, McGregor M. Assessing the impact of health technology assessment. Int J Technol Assess Health Care. 1997; 13:68–80. [PubMed: 9119625]
12. Cooper RB, Zmud RW. Information technology implementation research: A technological diffusion approach. Manage Sci. 1990; 36:123–139.
13. Morse, JM. Designing funded qualitative research. In: Denzin, NK., Lincoln, YS., editors. Handbook of qualitative research. Thousand Oaks, CA: Sage Publications; 1994.
14. Huberman, AM., Miles, MB. Qualitative data analysis: An expanded sourcebook. Thousand Oaks, CA: Sage Publications; 1994.
15. Mays N, Pope C. Rigour and qualitative research. BMJ. 1995; 311:109–112. [PubMed: 7613363]

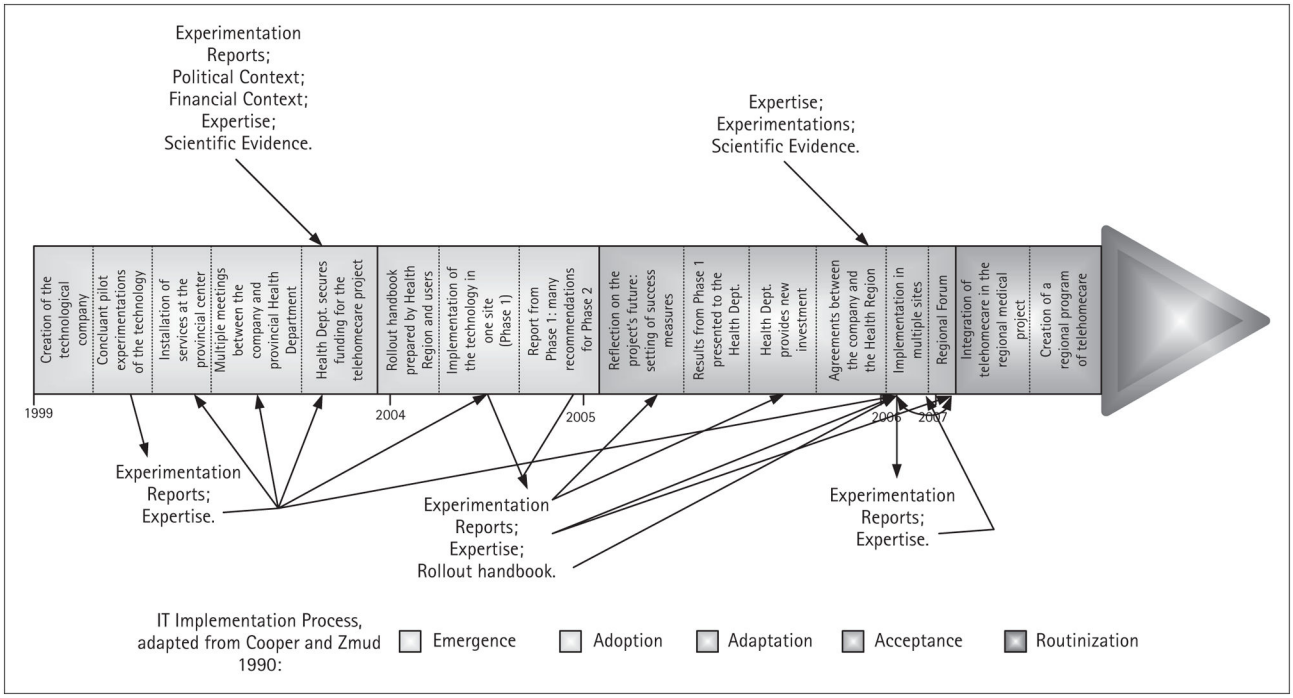

Fig. 1.
Timeline graphic of critical incidents and knowledge application.