

Canadian Paramedic Perceptions and Requirements for Adoption of Speech Recognition Technology: Brief Outline

Background

Speech recognition (SR) hands-free documentation can reduce paramedic workloads and reduce missing or omitted patient information during handover to emergency departments. SR technology used by physicians in medical charting reduces charting time, produces more complete notes, reduces workload, and is less error-prone than typed charting (1,2). Advancements in natural language processing, noise reduction, speech synthesis, and pre-processing have made SR technologies more efficient and viable in a pre-hospital care environment (2,3). SR charting technology for paramedics has been tested in Canada and abroad, focusing on technical implementation and feasibility of noise reduction (4–6). However, none have been implemented in a live environment.

Despite studies indicating the contrary, there is a perception among healthcare providers that SR documentation, in general, is error-prone and difficult to use (7,8). This misconception among end-users could lead to resistance and issues with the implementation and/or adoption of systems with SR documentation components. The reported failure rate of health information technology projects is 40–70% (9), and implementation costs for health information technology projects are high (10). High prices and failure rates make health information technology projects risky for health systems. To help lower that risk and increase end-user adoption, understanding the end user's requirements, perceptions, and expectations for the technology (11), in this case, SR documentation technology, is essential.

Aims and Objectives

The primary objective of this exploratory study is to identify potential user requirements for SR charting technology and to inform strategies to increase the likelihood of paramedic end-user adoption in Canada. The proposed study will investigate which features or functions would be most important to end-users to achieve this objective.

The secondary objectives are to identify paramedics' current attitudes towards hands-free documentation and to identify paramedics' current technology use levels. Use of and attitudes toward technology are important adoption factors (12). Understanding the current landscape of paramedics' attitudes and use of SR will be important in future implementation planning.

Methodology

The proposed research will be a 2-phase explanatory mixed methods (i.e., collecting qualitative and quantitative data) study (13). A mixed methods study design is commonly used when determining user preferences and beliefs (14–16). Combining the qualitative and quantitative data will provide a more robust picture of which aspects of the SR technology would be most important in determining end-user requirements for paramedics.

Implications and Contribution to Knowledge

Previous studies in this area focused on technological development and used small focus groups to test prototypes and elicit usability feedback (4,5,17,18). Prior studies have yet to undertake a large-scale survey of SR technology use with paramedics. This study intends to capture the perceptions, attitudes,

and challenges of hands-free SR technology from Canada's diverse paramedic service settings (19). The various practice environments could offer insights into the different needs associated with urban vs. rural practice. A recent meta-analysis identified that technology acceptance is influenced by user attitudes and the perceived ease of use of the new technology (20). Future development of technology can be optimized for user acceptance by identifying the features and functions that would improve the ease of use and identifying paramedic attitudes about existing technology.

While this proposed research will focus on the Canadian paramedic population, the results should be generalizable to other paramedic services using similar service models (21). Most paramedics face similar working conditions, so design and feature needs would be similar. While local and regional differences, like the level of integration with the health system, will need to be accounted for, this proposed research would provide a starting point for design and function development and dispelling myths regarding SR technology. Future researchers could generalize some features or functions to other environments, such as disaster response and emergency medicine.

Developing a more efficient and effective paramedic documentation system is a highly sought-after goal (4,5,22). As mentioned by Tavares et al., one of the enabling factors to achieve the principles guiding the future of paramedicine in Canada is leveraging advanced technology (23), like NLP and SR technology. The proposed study will provide a knowledge base upon which to build those advanced technologies and identify new avenues of pursuit.

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