CLINICIANS' PERCEPTIONS OF TELEMEDICINE FOR CONDUCTING FAMILY CONFERENCES PRIOR TO TRANSFER TO A TERTIARY CARE CENTRE INTENSIVE CARE UNIT

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Abstract

Objectives: Critically ill patients are often transferred from rural to tertiary care medical centres for further higher levels of care. The transportation process may delay family conferences during which prognosis and goals of care are discussed. These conferences typically occur when family members meet the treating physicians for the first time in person after transport. Telemedicine is a tool that may be used to bridge this gap in communication by enabling these family conferences *before* transport. There are no data on perceptions of telemedicine used in this setting. We conducted a qualitative study assessing provider perceptions regarding the use of telemedicine for conducting family conferences prior to transport. **Methods:** Critical care physicians and nurses were invited to view an educational video demonstrating the process of conducting a family conference via telemedicine. Immediately following viewing of the video, physicians and nurses filled out an open-ended questionnaire regarding their thoughts and perceptions of the video and the telemedicine family conference approach. **Results:**
There was a 68% response rate to the surveys. Responses were categorised into two major themes: benefits and barriers. Within the theme of benefits, three sub-themes were identified: satisfaction, knowledge and quality of care. We identified four domains within the theme of barriers: time, perception, technology and logistics. **Conclusions:** Respondents believe that there may be several benefits including increased satisfaction, improved communication and empowerment of families by dissemination of knowledge. Barriers to the use of this intervention identified include costs, time, technology and negative perceptions of the telemedicine conference.

Keywords: telemedicine; palliative care; communication in the ICU; telemedicine and communication; rural health care

Introduction

Critically ill patients have a high risk of death and are often first seen at smaller rural hospitals and subsequently transferred to tertiary care centre (TCC) intensive care units (ICUs) for a higher level of care. Early and open communication about prognosis, palliative care and end-of-life (EOL) issues is very important for these critically ill patients and their families.[1,2] Studies have shown that early communication defining prognoses increases perceived quality of death and dying among family members of loved ones who die in the ICU.[3] Due to long transfer times and the need for family members to travel to receiving hospitals, families of these patients may not be able to participate in discussions regarding disease processes, prognosis and goals of care until after the patient has been transferred, sometimes several days into their loved one's critical illness. Telemedicine may provide a solution to providing early family conferences for this patient population, and our previous research suggests that using telemedicine in this setting is feasible.[4] However, the experience and perceptions of clinicians using this novel intervention are unknown.

Telemedicine has been in existence for over 55 years and has been used in a variety of health care delivery contexts.[5,6] Although the number of telemedicine programs has steadily increased, the consistent availability of telemedicine is still not widespread.[7-9] This limited proliferation of telemedicine has been attributed to unavailability of technology, concerns about liability, and reimbursement issues.[5,10-13] While telemedicine may bridge communication gaps among clinicians and family members of critically ill patients, acceptability of telemedicine technology by medical professionals has been a limitation to its diffusion on a national scale. Studies have shown that physicians represent one of the principal groups of telemedicine users, and their acceptance is critical in sustaining a telemedicine service.[12] Data suggest that there are specific factors that influence the implementation of new technology in the health care service such as perceived usefulness and usage intentions in terms of social influence (subjective norms, voluntariness, image) and cognitive instrumental processes (job relevance, output quality, result demonstrability, perceived ease of use). These factors have been evaluated further using the Technology Acceptance Model (TAM), an information systems theory that models how users come to accept and use a technology.[14,15] This model incorporates perceived usefulness, perceived ease of use, attitude toward use, behavioural intention to use, and other external variables to evaluate actual system use. Although various models exist to evaluate acceptance of Information Systems, the TAM model has been used extensively in evaluating acceptance of technology in the health care field. One study applying the TAM model specifically towards telemedicine found that perceived usefulness was the most significant factor affecting acceptance.[16] Attitude towards telemedicine was also considered an important factor, but has not been fleshed out in its entirety. Interestingly, perceived ease of use was considered significantly less important.

Telemedicine is a tool that may be used to bridge the gap in communication between physicians and family members of critically ill patients transferring to a tertiary ICU by enabling these family conferences *before* transport, however before successfully implementing a telemedicine intervention, perceived barriers and facilitators need to be understood and addressed to help ensure the intervention is widely accepted. There are no data on perceptions of telemedicine used in this setting. We conducted a qualitative study assessing provider perceptions regarding the use of telemedicine for conducting family conferences prior to transfer from a community hospital to a tertiary care centre (TCC).

Methods

The study sample included providers who would potentially participate in such conferences on the accepting side of the transfer as part of the receiving care team (Intensive Care, Cardiology, Palliative Care and Hospitalist physicians and nurses). These groups of providers were invited to attend a presentation about telemedicine for family conferences on four different dates. Those who attended viewed an educational video demonstrating the process of conducting a family conference via telemedicine. The video included a brief introduction to telemedicine, a sample case in which a telemedicine conference might be beneficial, a demonstration of a telemedicine family conference, and a brief summary. The video can be accessed at: http://www.youtube.com/watch?v=gzIDUl1TChE. Immediately after they viewed the video, participants filled out an open-ended questionnaire regarding their thoughts and perceptions of the video and the telemedicine family conference concept. The questionnaire was developed based on previous literature about perceived barriers and facilitators towards telemedicine. We used questions that would generate rich qualitative data about specific concepts derived from the TAM model such as perceived usefulness, perceived ease of use, attitude towards the intervention, and likelihood to use the intervention. In addition to these quantitative data we collected information about current user trends.

Analysis
Using a general framework guided by the concepts previously described in the TAM literature, we developed a basic core set of concepts or general themes which we applied to the responses. These included perceived benefits and barriers. The results of the questionnaires were subjected to qualitative analysis (theory based approach to grounded theory) and are reported here using the results of thematic analysis.[17] Themes and subthemes are described with representative excerpts from the data to elucidate each domain identified. The responses to the questionnaires were transcribed into one working document. Two

independent coders analysed the data to identify initial axial codes. Both coders then compared codes and using a 90% inter-user agreement rate to prepare a formal codebook. Finally, both coders independently re-analysed the data and identified themes and sub-themes, the results of which are described in Table 1. Descriptive statistics are used to describe the study population.

Results

Fifty surveys were distributed to nurses and physicians and 34 survey responses were received (68% response rate). Of the respondents, 20% were critical care RNs and 80% were physicians (hospitalists or ICU physicians). Sixty percent of respondents were aware of a telemedicine service available at this institution but only 9% had used it before. Thematic analysis specific to the core concepts of benefits and barriers revealed several subthemes within each category.

Benefits
Within the data coded under the major theme of benefits, we identified three subthemes or domains including satisfaction, knowledge and communication.
Satisfaction. Participants believed that there would be increased family satisfaction with care using telemedicine. Respondents believed that using telemedicine for this form of communication could decrease anxiety among family members, build relationships and allow families to outline goals of care; all of which would lead to increased satisfaction among family members.
Some examples from the questionnaires included:

"…family satisfaction and confidence of care; now there will be an understanding of goals prior to transfer, rather than the next morning."

"Early contact with the family will improve family satisfaction. Decrease burden."

"I can't really see a lot of downsides to this. If I were a family member, I think I would be thrilled to see the primary team prior to transfer. Families can be held out of the patient room for hours on arrival if patients are quite sick and need lines and tubes and testing. I think this period of waiting would be much easier if a conversation has already been had."

Participants felt that the potential for improved satisfaction could apply to providers. By using telemedicine to clarify goals, providers on the accepting side would have established a relationship

with family members before their arrival and providers on the transferring side would have the opportunity to communicate more directly with the accepting treatment team.

"…introduces appropriate care team prior to patient arrival and will provide a smooth transition."

"…could greatly improve relationship building with families, save resources by avoiding unnecessary or unwanted treatments and/or transfers, and better communication between and among care providers."

Knowledge. Another subtheme that derived from the data was the concept of imparting knowledge. Participants believed that by utilising telemedicine they could teach families prior to transfer, thus allowing family members/loved ones to better understand what might occur following transfer. They felt that understanding prognosis and meeting the new treatment team prior to transfer provided families with new knowledge that would improve their overall experience with dealing with a critically ill loved one and transfer to a TCC.
"Families will already know the faces of the accepting team. Families will have a more realistic set of expectations ahead of time. (Both should improve satisfaction)."

"To know the family and their expectations and goals of care and to make sure the family is aware of the prognosis….is a real benefit".

"Access to more background information on patients will be helpful. We can establish a better understanding for families about the current situation and what the best plan is…."

Quality of care. Finally, several comments were related to the potential to improve quality of care. Participants felt telemedicine would aid in improving care by allowing discussions about prognosis to occur earlier in their loved one's care. They also believed that if done properly, telemedicine communication could be used to establish goals of care and clarify to family members what to expect from a hospitalisation. The knowledge that is imparted to participants during the conference may aid not only in understanding treatment plans and allowing for shared decision making but also in communication from the onset; allowing family members to know the treatment team sooner.
"Open communication, early referring to the family…will help manage expectations and set goals."

"The biggest beneficiaries would be the families of the critically ill; they will, hopefully, have a clearer picture of what to expect".

"Huge benefit of establishing rapport with the family in a timely way. Families will undoubtedly be happier if they have realistic expectations prior to transfer."

"Decrease anxiety with patient/family member by clarifying goals of care with the treating physician. Introduces appropriate care team and allows for smoother transition from one institution to the other".

Barriers

Within the theme of barriers, we identified four subthemes or domains including time, perception, technology, and logistics.

Time. Participants thought that time might be a significant barrier to the use of telemedicine. They were concerned telemedicine conferences would take a long time to conduct and would be too time consuming to set up and therefore would not be a resource clinicians would readily use.

"A big concern would be scheduling all the participants, timeliness of the conversation."

"Time, family willingness to "waste time" while conducting conference."

"Time; often having everyone available prior to transport I would imagine could be very difficult, especially if the patient is very unstable and transport is needed ASAP."

Additionally, there was a sense that the timing of the telemedicine conference was problematic from a patient care standpoint. The conference may interrupt the delivery of care to patients already admitted to a TCC and might delay transfer of a seriously ill patient. *"Prolonged conferences with family when additional patients require care could be an issue."*

"Using this technology might be waiting too long to have the conversation."

"If a patient is crashing, time is important. May delay transport, consume availability of the physician...."

Negative perceptions of telemedicine. Another key subtheme under the broad theme of barriers was perception. Perception could be subdivided further into perceptions of clinicians and perceptions of families. Respondents believed that using telemedicine might seem like an effort to avoid admissions and that it would have to be presented to referring hospitals as a tool to aid communication, not avoid care.

"Potentially, family or referring MDs may think we do not want to take the patient or we are trying to delay transfer."

"Team has to be deliberate in identifying goals of care and to not let personal bias enter into a subconscious effort to dissuade family from transferring patient."

"The impression that (accepting hospital) may not be accepting of receiving the patient, although this was not reflected in the video, it remains an issue. Would need real champions on both ends of the communication lines and both facilities."

Family perception was also an interesting subtheme. We found that many clinicians who had never used this technology were concerned about the impersonal way technology can be perceived compared to face-to-face conversations.

"....I think it may be more difficult to get a decision over a video feed as this is less personal...."

"Difficulty of creating personalised connection between a physician and a patient."

"Families could feel like we are pushing them down a 'comfort' road prematurely, but in this video that was clearly not the case."

"The primary concern is that we may lose personality or humanity in the discussion between doctor and family."

"Families may find it cold and impersonal, absent personal touch using telemedicine."

"Even with the best people involved, talking through a video set up will always feel less personal than a face-to-face meeting. That said, the world is getting more and more used to communicating this way."

"It does seem very impersonal in comparison to an in person meeting however. Lack of physicality and presence which might be important with emotional families."

Technology. Another pervasive theme surrounded the concept of technology. There were concerns that the actual telemedicine setup would be too difficult and that its availability might be significantly limited.

"One concern might be in using the equipment. Who sets up the monitor and what do you do if you have a

problem, especially at night?”

“Getting access in rural locations seems like a big barrier....”

“You would need to be very familiar with the technology. Availability of the technology is another major issue....”

Logistics. Logistical issue related to conducting a multidisciplinary conference was another theme present among almost all participants' responses. There were concerns about technology and time involved as described earlier, and in addition, specifically to the coordination of people, facilities and supplies.

“I think it will be difficult to get access in rural locations and getting all the MDs there at once.”

“Coordinating schedules to ensure all members can be available.”

“...gathering all the necessary persons in the same place when there is a busy ICU or time is of the essence.”

“...getting all the right parties in the room at one time.”

“Trying to get all disciplines to meet with a family at a convenient time is a difficult task [even] without telemedicine....”

In addition to these themes, lack of reimbursement, delaying transfer, and a lack of education regarding appropriate communication skills using telemedicine were also concerns.

“I think that taking the time to do this would be helpful if time to communicate during these conferences were reimbursed.”

“What if this delays transfer, how do we address that with family members?”

“Since it is so brief and impersonal, we must be careful in conversation to be accurate with information and not lead to inappropriate expectations.”

Discussion

This novel investigation provides new data about clinicians' perceptions of the use of teleconferences for early communication with family members of critically ill patients who have been requested for transfer to a TCC. Previous studies have shown telemedicine can be used effectively to provide clinical care such as diagnosis and management. For example, patients who have used telemedicine for consultative purposes report no difference in satisfaction with these encounters compared to interactions with providers face-to-face.[18,19] In addition, Collins et al found no difference in satisfaction outcomes when comparing a telemedicine care group with a usual care group.[20] To date, studies of telemedicine have focused on consultations empowering patients with chronic diseases to manage therapies and participate in shared decision-making and have demonstrated increases in patients' knowledge of disease processes and quality of life.[21,22]

There are no data, to date, to support that telemedicine used for conducting family conferences can have the same impact on health care service utilisation or perceived quality of care by family members. We found that providers believed that families could have increased satisfaction with overall care using telemedicine for family conferences even though it is not being used to provide direct care but to improve communication. Additionally, this study found that providers believed that telemedicine could be used to educate family members and this could benefit decision-making and enhance satisfaction with care, leading to appropriate utilisation of services by providing early communication and providing care that aligns with patient wishes.

We also found that some providers believed that telemedicine could help improve quality of communication with a patient's family. Although respondents speculated about what aspects of this process would improve communication, such as clarity and establishing rapport, this concept of improving the quality of communication needs be evaluated in detail. In addition, although some providers thought communication would be enhanced to some extent, many were also concerned about the perception of communication being too impersonal. Data suggest that telemedicine improves communication because it facilitates communication from a distance.[23] However, there are only a few studies that have dealt with the nature and content of communication, such as verbal content analysis during telemedicine consultations.[24,25] The results of this study suggest that further investigation is needed in this domain, particularly surrounding the experiences of the family members with receiving this form of communication.

Several additional barriers to the use of telemedicine for conducting family conferences were identified including time, negative perceptions by providers and family, technological issues and logistics. Of interest, not all these are the usual barriers to telemedicine that have been identified in previous studies. In addition to the concern about a perceived loss of personal contact by the physician with family members, there was also concern that clinicians at referring rural hospitals might find this form of communication as a way to dissuade transfer of a patient. This suggests that although communication with family members might be enhanced with telemedicine, an unplanned effect may be conflicting perceptions between tertiary care center physicians and the referring physicians. This interesting barrier needs to be explored further by understanding the experience of clinicians who utilise telemedicine for this purpose. Technological limitations have been identified as a key barrier for decades and will likely remain a barrier until telemedicine is widely accepted and utilised. In addition, regulatory, work force, cultural, licensing and reimbursement issues have been domains identified as significant barriers in the past.[26-28]

Previous research has shown that patients perceive telemedicine to be useful because: 1) they have the opportunity to have their primary physician present while seeking subspecialty service, 2) they have increased social support by receiving care from multiple people simultaneously, and 3) there is decreased travel time and distance to receive care.[18,19,29-31] It is unclear if these findings will apply to telemedicine used for early family conferences.

Data suggest that physicians who use telemedicine consultative services are usually satisfied with the process and clinicians that have used telemedicine before are more likely to use telemedicine again.[32] Users also have more positive attitudes regarding telemedicine than do non-users.[9] This is also reflected in our data: there were significant concerns regarding the logistics and time involved in using telemedicine though only 9% of respondents of this study had used it in the past.

There are limitations of this study. First, the response rate to the questionnaires was 68%, and although this is a better response rate than most questionnaire/survey studies,[33] we still were not able to capture the perceptions of 32% of potential responders. Moreover, there were very few non-physician responses. Despite these limitations, this study is significant in that it identifies new areas in telemedicine that are in need of exploration; specifically, verbal content analysis of telemedicine interventions and prospective studies using telemedicine for family conferences need to be investigated.

Conclusion

Telemedicine has been used for diagnostic, therapeutic and educational purposes in the past. This study describes the perceptions of clinicians using telemedicine to conduct family conferences with family members of critically ill patients. ICU physicians and nurses believe that there may be several benefits to this form of communication including increased satisfaction, improved communication and empowerment of families by dissemination of knowledge. However, they also identified barriers to the use of this intervention in terms of increased and unreimbursed time commitments, problems with the technology, and logistical difficulties. In addition, they expressed concerns that families and referring providers could have negative perceptions of the receiving care team if the receiving care team was perceived to be discouraging transfer for ulterior motives and that the communication might seem impersonal. Additional research is needed to evaluate the perceptions of families and providers during pilot interventions of telemedicine for the purpose of conducting family conferences.

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Conflict of Interest. The authors declare no conflicts of interest.

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