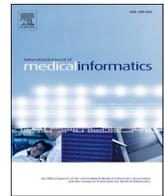




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Teleconsultations and their implications for health care: A qualitative study on patients' and physicians' perceptions

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ABSTRACT

Background: Digitization in everyday medical practice has gained importance along with the drive to expand teleconsultations arising from the COVID-19 pandemic. Previous qualitative research on teleconsultations has focused on synchronous communication between patients and clinicians. This study aims to explore physicians' and patients' perspectives on the adoption of teleconsultations between primary care and the referral cardiology department.

Methods: Participants were recruited for semi-structured interviews between September 2019 and January 2020. The interviews were audio-recorded and pseudonymized. The transcribed interviews were stored, coded, and content analysis was performed in MAXQDA.

Results: A total of 29 participants were interviewed. Patients and physicians merged in their views on 'process' issues, i.e., those concerning a better prioritization of patients and an improved collaborative practice, albeit with possible technological constraints. Physicians recognized that teleconsultations presented an educational opportunity for managing patients' health problems. Our findings suggest that not all patients would require equally intensive collaborative activities across the health system. The barriers described included difficulties using the system (technical issues) and concerns about workload as a consequence of the disruption of traditional clinical routines. Increasing the range of collaborative strategies available to health care providers may require a broader assessment of the way that care processes are structured between levels of care. Patients revealed strong support for teleconsultation on the grounds of interprofessional collaboration and avoidance of unnecessary hospital visits.

Conclusions: The implementation of teleconsultations between levels of care may be facilitated when patients, caregivers and physicians see the added value of this service, that adequate resources are put in place and that there is flexible implementation. This work adds an in-depth understanding of participants' perceptions of this intervention in a case study. Obtaining context-dependent knowledge will help program leaders better understand how to establish telemedicine services as a real-world sustainable option.

1. Background

Telemedicine applications, including teleconsultations, can potentially overcome health systems challenges associated with accessing care and coverage of services. The word "telemedicine" is a combination of tele and medicine, and the concept is not new. The use of long distance communications for medical purposes extends into antiquity [1].

Teleconsultations are outpatient appointments using videoconferencing equipment to involve live interaction among geographically separated people. It is a component of the broader concept of telemedicine, which also includes remote patient monitoring and store-and-forward telemedicine [2]. There are three types of teleconsultation [3]: between a patient and a healthcare provider; between two healthcare providers; or a tripartite encounter between a patient and two

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healthcare providers (e.g. general practitioner [GP] and hospital consultant). The literature on teleconsultation has explored a multitude of topics. Evidence suggests that in selected patients, teleconsultations are noninferior to face-to-face consultations in terms of user satisfaction [4–6], feasibility [7,8], resource use [9–12] and clinical outcomes [13–19]. To establish telemedicine services as a sustainable option, further research is required on the experience of patients and clinicians with this technology in diverse settings and health care systems.

In Portugal, before the COVID-19 pandemic, several telemedicine services were being piloted, most for populations living in remote areas [16]. In 2017, a project aimed to implement teleconsultations involving cardiologists at a central hospital and general practitioners (GPs) at primary care practices with different geographical, organizational, and technological characteristics.

2. Objective

This study aims to explore physicians' and patients' perspectives on the adoption of teleconsultations between primary care and the referral Cardiology department. Conducted just before the COVID-19 pandemic brought new impetus to teleconsultations in primary care, this work illustrates users' expectations and problems emerging with health information technology adoption that can be useful to countries aiming to implement or to expand teleconsultation services.

3. Material and methods

This qualitative study was embedded in an organizational case study of the introduction and rollout of a new service model, taking account the evolving national context. This single case study design of a 2-year pilot phase facilitates the understanding of the phenomenon of teleconsultations that is at the same time context-dependent and influenced by the individual's experience and characteristics [20].

We chose qualitative methods because they help to identify unexpected experiences and provide in-depth understanding of how participants' interactions with interventions produce change [21].

3.1. Settings

The context for this work is the publicly funded National Health Service (NHS), where GPs act as 'gatekeepers' to secondary care. The communication between levels of care relies on electronic health records (EHRs) and store-and-forward referrals from the GP to the secondary care provider (rarely leading to a dialogue). Often, external physician communication requires phone calls, e-mails, letters or using patients as messengers. To tackle this, Portugal has been developing a nationwide accessible EHRs network platform.

This study took place in six primary care outpatient clinics and the Cardiology department of the Hospital and University Centre of Coimbra-General Hospital. The primary care clinics and the referral hospital are located in central Portugal, where approximately 1.6 million people live. During the project GPs could refer patients who required specialized care from cardiology using two pathways. The standard of care was to directly refer the patient to the cardiology clinic for a face-to-face consultation through a store-and-forward telemedicine application. The alternative pathway was to refer the patient for a teleconsultation which involved GP, cardiologist and the patient. This teleconsultation happened through videoconferencing between the primary care clinic (where GP, patient and caregiver were located) and cardiology clinic (where the cardiologist was located). The teleconsultations were implemented for both first referrals and follow-up. No remote monitoring of patients was implemented in this project.

3.2. Participants

Patients and GPs participated in teleconsultations at the primary care

practice, while the cardiologist participated from the referral hospital. Patients and caregivers were recruited for interviews from all six family health units in person and via telephone with the collaboration of GPs. We included adult patients with cardiovascular conditions who had been referred for a teleconsultation and were able to speak and understand Portuguese or English. The oldest patient participants were accompanied by caregivers and, whenever that happened, caregivers were also interviewed. Sample sizes were determined based on ongoing data collection and analysis. Participants were recruited for interviews until thematic saturation was achieved. Informed consent forms were signed by all participants.

3.3. Data collection and data analysis

A semi-structured interview guide for the individual face-to-face interviews was developed based on a review of the literature and discussions among the authors.

The lead investigator conducted the interviews, which were audio-recorded and pseudonymized. The digital audio recordings were transcribed verbatim by an external transcribing service and the transcripts were validated against the recorded material by the interviewer. All transcribed interviews were analysed independently by all the researchers. The transcripts were stored, coded, and analysed in MAXQDA (software for qualitative data analysis, 1995–2016, VERBI Software-Consult Sozialforschung GmbH, Version 12.2.1, Berlin, Germany). Data analysis followed the steps for conventional content analysis [22]. The interviewer and one other researcher coded all data; any discrepancies were discussed until consensus was reached. The coding system was refined until no further codes emerged. We conducted an open, inductive analysis, starting with open coding. Additional information on the analysis process is available at the coding tree ([supplementary material](#)).

Other ways of thinking critically about data analysis were also employed, including comprehensive data treatment and deviant case analysis. This involved a re-interrogation of the data searching for new themes not covered by the initial data analysis [23]. We looked for deviant data to contradict our emerging analysis, a process known to add validity [24].

4. Results

Eleven physicians, fourteen patients and four caregivers were interviewed. The results from the interviews emphasize how the various actors perceive the application of teleconsultations differently and how these different perceptions contribute to organizational changes within the delivery of services. By the time the interviews were conducted (September 2019 – January 2020), all the physicians who were participating in this pilot project were included ([Table 1](#)).

The baseline demographic characteristics of patients and caregivers are contained in [Table 2](#).

We found two main themes divided into subthemes ([Table 3](#)).

4.1. Facilitators

4.1.1. Accessibility and prioritization of patients

Patients and caregivers noted that teleconsultations increased accessibility to specialized services, provided better continuity of care, and reduced travel expenses and caregiver's work absenteeism. The benefits were especially stressed by patients and caregivers in rural practices, who described the teleconsultation service as an effective way to access secondary care.

Caregiver (CG) 4: I think it was great, the process was quicker, and in the case of a serious condition, when contacting an expert on the subject, I think that things would have a different follow up, rather than being there, among thousands, or even forgotten in a drawer until the person would be called.

Some patients and their family caregivers indicated that it relieved

Table 1
Characteristics of Study Physicians.

	Number	Female/Male	Urban/Rural practices	<5 years in practice	5–20 years in practice	>20 years in practice
GP	7	6/1	3/4	1	5	1
Cardiologist	4	2/2	4/0	1	0	3

Table 2
Characteristics of Study Patients and Caregivers.

	Patients (No.)	Caregivers (No.)
No.	14	4
Sex		
Female	7	4
Male	7	0
Age, mean (range), years	71 (28–91)	48 (24–60)
Type of telemedicine		
Joint teleconsultation	7	2
Teleconsultancy	7	2
Education Level		
<High school diploma	13	
High school diploma or GED	1	2
College attendance or above		2
Available technology		
Computer with video camera	1	4
Mobile device (includes smartphone)	8 (2)	4 (2)
Fixed or landline telephones	13	4

GED = general equivalency degree.

Table 3
Themes and subthemes related with the implementation of teleconsultations.

Facilitators	Barriers
Accessibility and prioritization of patients	Technological hurdles
Enhanced primary care setting	Workload and time constraints
Collaborative practice	Limitation to the physical examination
Real-time interaction	Need of administrative support

them of physical, psychological, and financial stress to travel for treatment that was not available locally. They described that the reduced burden of health care access as one of the major benefits of teleconsultations. This benefit was also noted by GPs and cardiologists.

CG14: it is much better than going to the hospital, without any doubt. Much better for us. Even his mobility is also very reduced. We get in here a lot faster than walking through those huge corridors... It takes the patience out of anyone to get an appointment.

Cardiologist (C) 2: at selected cases, it can obviously be useful for the patients, it avoids going to the hospital, and the associated costs and inconvenience inherent to that trip. Especially for patients who are farther away and for those who have more limited mobility.

Physicians perceived that teleconsultations prevented the occurrence of low-value specialty visits due to incomplete workups and referrals for problems that could be managed in primary care. Also, there were cases where the GP had chosen not to refer the patient, but the cardiologist suggested referral after the teleconsultation as earlier access to specialty care could result in quicker treatment.

GP7: this patient I probably would not do anything. Because she had already gone to cardiology many times, even now she was discharged from cardiology. And I was extremely surprised by the answer that the colleague gave me from there. She called the patient again and proposed an alternative treatment.

These findings suggest that teleconsultations could improve the timeliness of access to secondary care in two ways: (1) early detection of cases that should be referred; and (2) the future reduction in waiting times for face-to-face consultations due to the improved system efficiency for high-acuity cases not amenable to teleconsultations.

4.1.2. Enhanced primary care setting

Knowing that their GP had support from an hospital consultant strengthened patients' and caregivers' confidence on the care they received and felt that this could be an acceptable alternative to hospital referral.

Patient (P) 6: if my GP has an urgent problem and she can contact a colleague who is a specialist to advise her, it is better than waiting for a week, or two, or a month, or two until another appointment. And that's very good, each doctor has his specialty. If in that day, at that moment, I can get to know what is wrong with me or what I should do, I think it is really good! To heads can perhaps reach a better conclusion.

Patients placed value on the expertise of the cardiologist and the relationship they developed with the GP, who usually follows the patient over time, providing increased continuity and comprehensive care. Patients and caregivers welcomed the interaction between physicians and felt reassured that their needs and worries were taken seriously.

C4: I think patients themselves feel that the professionals are interested, concerned with the situation and that the patient is not abandoned.

For patients with common medical problems, GPs may order appropriate diagnostic tests and deliver more medical management within the primary care setting.

C3: the patient is better managed with an effective, quick, and convenient follow-up. If they don't need to go several times to the hospital, and still be provided with the expected high-quality management, I believe they will be better treated and more satisfied with health care.

4.1.3. Collaborative practice and real-time interaction between physicians

Teleconsultations may contribute to improved coordination of care because of expedited communication between GPs and cardiologists. Physicians discussed that real-time interaction had advantages over the existing asynchronous technological interface.

GP6: When I'm reading my colleague's report, sometimes I want to pick up the phone and call, right? There have been things unnoticed or there are things that I didn't notice, and the clinical discussion gets lost.

Physicians stated different preferences with respect to new forms of collaborative practice such as the use of videoconferencing for synchronous communication between the GPs and cardiologists, to discuss clear consultative questions, when the patient would not be present.

GP3: We have a doubt, during a week we can clear up doubts, instead of waiting for I don't know how long for the appointment, and then sometimes you go there and won't do a thing, because something is missing, and if we had talked a little bit it would have been resolved. The goal is to be more agile and solve problems faster, in the shortest time.

GP2: there is a closer relationship, with colleagues in cardiology, and we are also more comfortable to ask questions, sometimes we take advantage to ask questions of another patient that is not the one we are discussing.

4.2. Barriers

Our results underscore the need to continue seeking and adapting to unintended consequences post-implementation to successfully incorporate the ongoing transformation of work processes.

4.2.1. Technological hurdles

Patients may participate less during teleconsultations due to technological hurdles (e.g. poor video quality or sound), but there are also concerns that health care providers may communicate with each other while patients assumed a more passive role.

P7: I saw a problem the first time I came here, they [the doctors] tried and

the conference failed, at that time. They must have had some problem in the connection.

It is possible that the interference in the doctor-patient communication might be mitigated by considerable improvements in the technology, e.g. to improve internet connectivity.

Patients held views about the value of the face-to-face consultation in issues such as communication and relational closeness.

P13: I believe that when we are around doctors, and they are talking to us, I think it would be better. I mean, in the presence of doctors, we talk, and they speak to us.

For the physicians, the disturbances and perceived limitations that were related to technology addressed time (aspects of flexibility, being late or on time, waiting and logging in) and senses (hearing and seeing). Technical issues sometimes led to adaptations in advance to the technical circumstances, for example, knowing that audio would occasionally fail led clinicians to exchange phone numbers prior to the meetings.

GP7: it didn't work, I called the informatics, however it was already the time that we had scheduled, I had one phone with the informatics, another one calling the hospital saying, "look, I'm late because I can't call". It took me around one hour with this, to do an appointment with a patient.

4.2.2. Workload and time constraints

For both groups of physicians, another common barrier described was the insufficient time allocated to the additional work attributed to the teleconsultations.

GP7: the least favourable is, without any doubt, the time consumed. It would be easier for me at the end of an appointment to think "oh, I have a question and I'll write a regular referral". With this, I'll spend more time organizing my thoughts. In the end, it helps me make better sense of things, to do a thorough history, because I write a teleconsultation referral more carefully than for regular referrals, so when we talk they have a more complete picture of the case.

C3: I think it makes a difference because it avoids visits from patients who don't really need an appointment, because many doubts can be cleared through teleconsultation. Sometimes, they [the GPs] can make a better assessment of the patient, to order a test which is missing and can be suggested by us [the cardiologists].

4.2.3. Limitation to the physical examination and need of administrative support

Cardiologists noticed that they cannot examine the patient during teleconsultations, but that this barrier could be mitigated by the description of the examination by the GP.

C1: to request the colleague to ask questions, or ask the colleague to clarify any aspect about the patient, possibly searching for any signs, for example that eventually the colleague did not search during the observation of the patient's physical examination. This is extremely valuable, better just in person, I would say.

GPs and hospital consultants stated that administrative support is needed to accomplish the scheduling of the appointments.

GP5: Our schedules are always busy with lots of appointments. Often, the timing of teleconsultations conflicted with other appointments that had already been scheduled. When they were scheduled in advance, we could make it.

5. Discussion

Patients and physicians shared the view that teleconsultations leads to better prioritization of patients and improved collaborative practice, albeit with the obstacle of technological constraints. Teleconsultations were regarded as a convenient service that helped clearing doubts and avoiding unnecessary referrals to the hospital. The physicians interviewed recognized that teleconsultations streamlined communication between levels of care and that they were educational opportunities. Less positive views referred to difficulties related to technical issues and concerns on workload, due to the disruption of traditional clinic routines

and the perceived clinical governance challenges. Our data suggested that physicians sometimes felt it was more time-efficient to discuss several cases without the patients being present in the teleconsultations.

5.1. Facilitators

Patients described that teleconsultations could improve access to secondary care and thus provide quicker diagnosis, investigation, and treatment. As in previous studies, our patients felt reassurance on the health personnel accounting for their needs [25,26] and recognized the immediate benefit of avoiding long travel or changes to their routine [27]. Teleconsultations can be used as a means to include the patient in the decision-making process [26], overcome poor accessibility and increase health care delivery [28], particularly for rural areas [29], offering a coherent service with greater continuity [30].

Cardiologists and GPs felt that teleconsultations were especially valuable where there was uncertainty about patient management, as it can enhance continuity of care and reduce the number of transitions of care. This had been previously shown for asynchronous communication [31,32]. Our results suggest that having live interaction with audio and video, helps GP and hospital consultant to establish a personal relationship even though they are not in the same location or institution. This is illustrated by the experiences of clinicians, when faced with technical problems or poor connection, used other videoconference tools to keep the discussion going.

5.2. Barriers

Patients recognized many technological hurdles and suggested a positive impact with improvements, namely the lack of synchronization between sound and vision [33] and to improve internet connectivity and image quality, echoing the results in other studies [34–36]. The technical problems are a common barrier to the success of video consultations [37,38]. Sites with good communication infrastructure or channels of communication among the GPs and hospital specialists may have a better chance of succeeding when implementing health care IT programs [39]. Practices should have access to technical support throughout the implementation process of health IT capable of responding to problems before user frustration impeded adoption success [40].

Earlier research suggests that limitations to physical examination may be a barrier to teleconsultations [41–43]. In our study, none of the patients identify this an issue and cardiologists stated that they would easily rely on the GP's examination. However, physical examination contributes to relationship-centred care [44], being described as a therapeutic intervention in itself [45]. It is unclear whether barriers related to lack of physical examination vary according to speciality or if they can be mitigated by joint teleconsultations involving GPs.

Another barrier mentioned by our participants was the additional work burden with administrative tasks, which may lead to system failure [46].

5.3. Strengths and limitations

To our knowledge it is the first case study to explore the experiences of patients, caregivers, GPs, and hospital consultants with teleconsultations, and the first in-depth description of the implementation of teleconsultations in Portugal. The use of an interviewer who was independent from the pilot project management contributes to the overall robustness of the findings and favours the consistency of questioning and rapport with participants. The use of an interview guide provided a uniform record to increase rigor. Analysis by a multidisciplinary team facilitated consideration of alternate interpretations of findings.

There are limitations to this study. We did not interview non-adopter clinicians and patients, who may have different view. Effort should be made to identify populations and visit purposes most appropriate for integrating telehealth visits between levels of care.

Future research is needed to contrast joint teleconsultation (two clinicians and a patient) and remote consultancy (two clinicians). As the volume of teleconsultations increases there may be new forms of organization, where co-location is less important, which should be tested. Although the planned intervention was joint teleconsultations, during the pilot, clinicians supplemented it with remote teleconsultancy without the patients being present as they felt it was more time efficient.

6. Conclusion

We found context-specific barriers and facilitators in the implementation of this complex intervention. Implementation of teleconsultations between levels of care may be facilitated when end users see the added value of this service, adequate resources are put in place and there is flexible implementation.

Teleconsultation was seen as a reasonable alternative to referral, as patients and caregivers felt that it integrated the GP's knowledge of the patient and the cardiologist's subject expertise. These participants also revealed strong support for teleconsultation on the grounds of inter-professional collaboration and avoidance of unnecessary hospital visits. As patients recognize the value of face-to-face consultations in communication and relational issues, a proposed combination of both modalities (remote and face-to-face) may be the most appropriate model of care.

Physicians valued having a tool to clear doubts quickly and to prioritizing patients for secondary care. However, not all patients would require equally intensive collaborative activities across the health system. As this new technology is integrated into social, organizational, and cultural environments, it must be reorganized and redesigned to find a new balance according to the individual routines.

CRedit authorship contribution statement

Ana Rita J. Maria: Conceptualization, Methodology, Software, Formal analysis, Investigation, Data curation, Writing – original draft, Visualization, Project administration, Funding acquisition. **Helena Serra:** Conceptualization, Methodology, Validation, Formal analysis, Visualization, Data curation, Writing – review & editing, Visualization, Supervision. **Bruno Heleno:** Conceptualization, Methodology, Data curation, Writing – review & editing, Visualization.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Ethical approval

The Research Ethics Committee at NOVA Medical School (49/2019/CEFCM), and the Centro Regional Health Administration Ethics Committee (33/2017) granted ethical approval.

Appendix A. Supplementary material

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.ijmedinf.2022.104751>.

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