Title page

The type of manuscript: original article

Title: Telehealth: Misconceptions and Experiences of Healthcare Professionals in England.

Running title: Misconceptions and Experiences of Telehealth

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Conflict of interest: The authors declare that they have no conflicts of interest to disclose.

Funding: This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Word count: The final word count for this original research is 3250 words excluding, appendix, table, references and the word count of the abstract.

Authors' contributions:

Reem Kayyali contributed to the writing of the paper, reviewing and commenting in detail on all versions, and checking data analysis. Reem Kayyali supported the overall management and delivery of the project. Reem Kayyali will be responsible for responding to reviewer comments.

Iman Hesso led on the writing of the paper and correcting all versions of the paper and contributed to data analysis.

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Shereen Nabhani Gebara contributed to the reviewing of the paper and commenting on all versions, and contributed to data analysis. Shereen Nabhani Gebara supported the overall management and delivery of the project.

The authors of this research paper had complete access to the study data that support the publication.

Abstract

Objective:

This study aims to look at telehealth awareness and experiences among healthcare professionals (HCPs) from different disciplines, in addition to factors impeding its adoption in healthcare delivery.

Methods:

Qualitative semi-structured interviews were conducted with 36 HCPs from different disciplines such as pharmacists, nurses and doctors in South London. A convenience sampling technique was used whereby HCPs working in local trusts, community pharmacies and GP surgeries were approached for participation. Thematic analysis was used to identify key themes using the NVIVO 10 software.

Key findings:

The four main themes that emerged were: awareness and understanding of telehealth, experiences and benefits of telehealth, barriers and facilitators of telehealth and misconceptions about telehealth. The study showed mixed response regarding telehealth awareness. Lack of telehealth experience was reported mainly among HCPs working in primary care. The barriers identified were cost and lack of funding and resources, whereas facilitators were raising awareness among staff and the public and investment in resources. Misconceptions identified were: fear of losing face-to-face contact with patients and vital care information; patients' beliefs and confidence in using technology.

Conclusion:

The current study showed experience and awareness level to be still low especially among HCPs working in primary care. Barriers and misconceptions identified are still the same as those reported in the literature which highlights that they have not yet been addressed to facilitate telehealth implementation in the UK.

Keywords

Telehealth, healthcare professionals, barriers, awareness, scepticism.

Introduction

Telehealth is a comprehensive concept for interventions involving technologies that permit the remote exchange of data between healthcare professionals (HCPs) and patients to support the management and diagnosis of health conditions. [1-3] Telehealth has been seen as an approach for handling the increase in the incidence of chronic diseases associated with an ageing population. [1]

In England, it has been estimated that over 15 million people suffer from a long term condition (LTC) and 70% of healthcare expenditures is being used to manage these conditions. The effective management of LTCs will not only have a positive influence on UK National Health Service (NHS) resources but will also improve patients' health and quality of life. Therefore, the need to redesign healthcare services has been acknowledged by the Department of Health (DoH) in the five year forward view with a significant emphasis on the role of technology enabled care. [4]

Telehealth has been found to be beneficial in managing several LTCs such as heart failure and hypertension. [5,6] However, evidence regarding telehealth is conflicting, with some studies showing positive results and others showing no effect or even negative effect. This evidence is mainly derived from small pilot trials rather than large robust ones, making generalisation rather difficult. [1] The Whole System Demonstrator (WSD) was the first large-scale cluster randomised controlled trial (RCT) to be funded by the DoH for testing the effect of a broad class of telehealth and telecare technologies in comparison to standard care in the UK. The trial involved more than 3000 patients with LTCs and demonstrated significant reduction in mortality rates ($p<0.001$), hospital admission rates ($p=0.017$) and length of hospital stay ($p=0.023$). [1]

Even though telehealth has been reviewed to be beneficial through the WSD trial, its implementation in the UK is still limited. There are different factors that are affecting the adoption of telehealth in the UK. [7] The potential of telehealth in community pharmacy setting resides in the ability to expand and extend the offered services by the pharmacist while complementing and enhancing the existing pharmacy services. [8,9] The use of technologies such as email, telephones, internet services, videoconferencing and self-monitoring equipment [10] allow the pharmacist to provide many services remotely such as virtual consultations, or remote monitoring of patients with LTCs . [8,9] Despite the fact that pharmacists in England can provide many services distantly such as New Medicine Service [11] and other services over the phone, their perceptions regarding the use of telehealth have not been widely considered in the literature. Currently, most of the studies in the literature

were found to focus mainly on patients' perceptions, and medical and nursing staff perceptions. This study, however, aimed to have a critical look at telehealth awareness and experiences among HCPs from different disciplines including pharmacists in addition to nurses and doctors.

Methods

Study design:

A qualitative approach was used to address the aim of this study. Semi-structured interviews were conducted face-to-face with HCPs. An interview schedule (Appendix 1) consisting of 16 open-ended questions divided into two main sections was devised. The schedule was designed by the authors to address the aim of the study. The first section was based on the awareness of telehealth (questions 1-3). The second section was based on experience with telehealth and the perceived benefits and barriers of its implementation. The structure of the interview depended mainly on the participants' experience in using telehealth. All HCPs were asked the first three questions in section (1). However, in section (2), HCPs who used telehealth were asked questions 4-9 only; whereas, HCPs who did not have any experience were asked questions 10-16 only.

A convenience sampling strategy based on local knowledge and proximity was employed to recruit the participants. HCPs of different disciplines were approached at different healthcare settings (primary care and secondary care) within South East and South West regions of London due to its convenience to the researchers. HCPs were recruited from the following main sites: Croydon University Hospital (CUH), Royal Marsden Hospital (RMH), in addition to community pharmacies and general practitioners (GP) surgeries within South East and South West London. CUH and RMH were chosen due to existing research collaborations between the academic institute and those trusts. HCPs in CUH were approached in person, whereby one of the researchers was allowed to promote the study in the staff canteen. At RMH, the trust agreed to circulate an e-mail inviting HCPs to take part. HCPs who expressed an interest to be interviewed either by a reply e-mail (HCPs at RMH) or in person (HCPs at CUH) were provided with an information sheet about the study accordingly. The researchers then contacted the HCPs at the two hospitals by telephone or e-mail to schedule the interview. Written consent to be interviewed and for the interview to be

recorded was obtained from the participants prior the interview. HCPs in community pharmacies and GP surgeries were approached in person by three researchers and provided with an information sheet about the study. A schedule for the interview was determined with those who accepted to participate and their written consent acquired. Sampling was done iteratively until data saturation was reached, where no new information was obtained out of the interviews [12,13]. The stopping criterion for data saturation, which is the number of interviews conducted without any new information after which recruitment was stopped, was three. [12]

Interviews were conducted between January and March 2015 by three researchers .All interviews were audio recorded and transcribed verbatim. Analysis of the data was done thematically using inductive (from data) and deductive (from literature) approaches. The transcripts were read and re-read until all emerging themes had been coded. All transcripts were managed and coded independently by two researchers using NVIVO 10 software (QSR International Ply Ltd, Doncaster, Victoria, Australia). The coded transcripts were then checked by a third researcher and a discussion was undertaken about all the emerging themes to ensure consistency of the findings. Despite that data saturation was reached after the 33th interview, yet all interviews were included for analysis. Results are presented in form of themes and corresponding subthemes underneath. Quotes from interviews are used to elucidate the findings presented under each theme or subtheme.

Ethical consideration

Ethical approval for this study was obtained from the Research Ethics Committee at Kingston University London (Reference No.1213/045).

Results

Due to the different methods of recruiting participants, it is difficult to calculate the response rate. However, the face-to-face recruitment was roughly in a ratio of one agreeing to participate from four being approached. A total of 36 HCPs were interviewed: 17 pharmacists, 11 nurses and 8 doctors. 25 of the HCPs work in primary care, 10 in the hospital setting and 1 in a clinical commissioning group (CCG) (table1). Interviews lasted between 15 to 20 minutes. Analysis of the interviews revealed the following four main themes:

- Awareness of telehealth
- Experiences and benefits of telehealth

- Barriers and facilitators of telehealth
- Misconceptions around telehealth

Awareness and understanding of telehealth

Just over half of the interviewees (n=19) were not fully aware or heard of the concept. The majority (n=18) were primary care based (10 CPs, 5 CNs and 3 GPs) in addition to 1 HP. In fact, some HCPs did not know about telehealth until the day of the interview and attributed this to the fact that they work in a primary care. Three CPs mentioned that their colleagues who work in the hospital setting have more knowledge.

"Not much actually, but I know a few of my colleagues that know a lot about it. I think this is because they work in a hospital" (CP)

On the other hand, 17 HCPs were knowledgeable of the concept. 9 were hospital based (4 MDs, 4 HNs, 1 HP), 7 were primary care based (4 CPs, 2 CNs,1 GP) in addition to 1 CCG pharmacist. However, the level of awareness varied. Most of the interviewees (n=10; 4 MDs, 3 HNs, 1 HP, 2CPs) were aware that telehealth assists patients with LTCs, by monitoring and measuring their clinical data and communicating them. For the others (n=7; 2CNs, 1 HN, 2 CPs, 1 CCG pharmacist), telehealth was simply the use of technology to improve patient care. This is because they haven't seen it directly implemented in their clinical settings.

"*I know it's the use of technology to improve care delivery*" (CN)

Experiences and benefits of Telehealth

Only 8 out of the 36 HCPs used telehealth (3 MDs, 2CPs, 2 HNs, 1 HP). The majority of HCPs (23/25) who worked in primary care had no experience of using telehealth with only 2 CPs reporting using telehealth in their work. The below subthemes emerged:

Improving patient care and making it more convenient for patients

Telehealth was perceived to be beneficial in terms of enhancing disease management, better self-care monitoring, early and effective interventions especially among HCPs (n=8) who used it. They reported the use of telehealth in several clinical areas in secondary care mainly dermatology, cardiology, radiology and surgery; CPs reported using telehealth to assist in medication adherence to improve patient safety. They described that information

can be exchanged competently and quickly with a patient via email or phone, thus allowing the HCP to make the appropriate decision regarding diagnosis or treatment. HCPs believed that by monitoring patients remotely, an exacerbation of a chronic disease could be detected and treated rapidly, thus potentially preventing hospitalisation and reducing hospital costs. This benefit was even recognised by the interviewees who did not use telehealth.

"…*the patient can be monitored between visits to the physician. So this will reduce hospital admissions*." (CP)

Majority of respondents, regardless of experience and discipline, found telehealth beneficial in terms of making care more convenient to patients, especially those living in far areas.

Saving resources

15 out of 28 HCPs, despite not using telehealth, reported that telehealth implementation will reduce their work burden and the burden on the NHS by saving costs/money.

"reduce cost for the NHS when it comes to the amount of money being spent on admission and emergency" (CP)

Telehealth as a facilitator for integrated care

Some participants perceived telehealth as a potential tool for implementing integrated care. They described that right now primary and secondary care sectors operate separately but telehealth will make communication between all the care sectors easier and this will enable the service to continue effectively if set-up.

"Having telehealth service in place will be a great facilitator for integrated care" (CN)

Barriers and facilitators of telehealth implementation

Cost and funding were closely intertwined and identified as the main barriers by most of the interviewees.

"Telehealth is very expensive to set up, from investing in the technology, infrastructures, equipment etc… there aren't enough funds to set the system up" (CP)

Investment in research about telehealth was also identified as a barrier.

Time and workload were also identified as key barriers pertaining to resources. Most HCPs reported that they already have a high workload in their day to day jobs and using telehealth may make their workload unbearable.

"Another barrier is time as a high number of patients could send multiple emails … requiring the clinician to set aside allocated time, which is not currently available." (MD)

HCPs (n=8) who used telehealth raised the need for patient education and telehealth training packages for clinicians. Technical problems such as internet in patients' homes were also listed as barriers. They highlighted that funding, properly educating staff and patients about the functionality of the service and having robust internet connection at patients' homes, were essential to overcome some of the barriers encountered and facilitate implementation.

Similarly, HCPs who did not use telehealth (n=28), considered the following as facilitators: raising awareness among staff and public about the service, and funding to allow investment in resources. There was no difference in the perceptions about facilitators with respect to the HCPs' discipline or sector.

Misconceptions around telehealth

HCPs, who lacked telehealth experience were sceptical about telehealth implementation. Similarly, some misconceptions were also reported by those who have used telehealth in their practice. The following subthemes emerged:

Loss of personalised care and missing vital care information

Fear of loss of face-to-face contact with patients was reported by most of the participants regardless of profession and experience. Nurses perceived telehealth as a threat to their livelihood/profession.

"I think nothing can replace that human-to-human contact." (CN)

Another concern which was mainly raised by GPs and pharmacists, who did not use telehealth, is that important care decisions can be missed and not noticed thus compromising patients' outcomes.

"Critical information could be missed as patients are not being seen as often as they used" (GP)

In addition, some HCPs mainly GPs, nurses and CPs who did not use telehealth were sceptical about the actual reliability of the service.

"*The reliability of the system, how reliable is the system and is there enough evidence in the UK to back this up*." (CP)

Lack of confidence in using technology and patients' beliefs

More than half of the interviewees expressed that the elderly, who are the main potential users, are most likely not to be familiar with the use of technological devices and might not be able to operate them. They reported that some patients might be sceptical about the system, as they believe that they get better care when they see their HCPs face-to-face. According to HCPs, most elderly patients are used to traditional care delivery; hence introducing telehealth might be difficult. Confidentiality issues about data transmission were also raised as a concern. Interestingly, these misconceptions were raised by the interviewees regardless of experience, discipline and sector.

"the patients, some of them cannot use technologies and some are used to the traditional ways of doing things so they won't want to switch" (CP)

Discussion

Analysis of the generated data revealed how HCPs from different disciplines and sectors perceive telehealth. Four main themes were generated: awareness and understanding of telehealth, experiences and benefits of telehealth, barriers and facilitators of telehealth; and misconceptions around telehealth.

The study has several limitations. First, it explored perceptions, barriers and misconceptions around telehealth from HCPs' perspective; hence some results should be treated with caution. For example, patients' beliefs and experience with technology were identified as a barrier by HCPs. However, this could be a misconception, and it would have been ideal and more important if these issues were explored from patients' perspective. This will be the focus of a follow-up qualitative study with patients. Second, although saturation of themes was achieved, yet, the use of convenience sampling, the lack of equal representation within

the sample with respect to disciplines and experience, and the fact that all participants came from an urban community in South London may limit the generalisation of the generated results and they need to be treated with caution.

The findings highlighted the lack of telehealth awareness among HCPs specifically in primary care. Almost half of the respondents were not fully aware of the concept even though the WSD took place in the UK and was one of the largest telehealth RCTs so far. [1]

The findings of this study suggested that the low level of awareness was most profound amongst CPs. This has not been previously reported. Low awareness of telehealth has been previously reported among nursing staff in England [14]. However, this concept has not been explored widely. This study shows that telehealth awareness level varies between work settings. Those who work in hospital settings were more aware than those in primary care regardless of profession. Our study showed that among the 25 HCPs who are primary care based, only 7 were aware of telehealth. Whereas for those working in hospital settings, 9 out of 10 were knowledgeable. This further emphasises the lack of understanding of telehealth role in self-monitoring at home and highlights the need to raise awareness among HCPs especially those working in the primary care settings.

Even though telehealth was perceived as beneficial by the responders, yet scepticism among HCPs was apparent. The fear of losing face-to-face contact came out as a major limitation. This was prevailing among pharmacists and other HCPs in the present study irrespective of experience and sector. Similar fears were also reported in the literature by nurses. [15-19] Confidentiality issues were also perceived by pharmacists and the other HCPs to be problematic. Interestingly, some studies reported that patients had no concerns about confidentiality [3,20-22] or the absence of face-to-face contact with an HCP during a telehealth consultation. [20] The WSD trial experience highlighted the importance of integrating telehealth interventions into the routine service management without disrupting the relationship between service providers and patients.[3] Telehealth should not be perceived as a total replacement of face-to-face consultations but a substitute to such consultations when clinically appropriate.[22]

In the current study, scepticism about the reliability of the service was reported among some pharmacists, GPs and nurses. This was reflected in a study by Sharma et al. [19] that found nurses to be sceptical about the reliability of the service. In addition, similarly to other studies, the fear of losing vital care information was also highlighted mainly by GPs and pharmacists. However, in these studies, nurses had concerns about missing some aspects of care management which they believed to be most appropriately managed via physical

examination. [14,19,23] It was interesting to note that most HCPs were also sceptical about the ability and confidence of their patients in adopting and operating the technologies involved as most of them are elderly, who in their opinion might be resistant to change. However, this was not the case in some studies which showed patients to be more positive regarding telehealth than HCPs. [24-26] Although, the WSD trial reported that concerns about special skills and expertise to operate equipment were perceived as a barrier by patients for telehealth adoption, it highlighted that these were based on patients' misunderstandings.[3] Even though the current study comes almost after five years since the evidence base regarding staff scepticism being reported as a key challenge for telehealth implementation in the literature, [15,17-19,26] yet it still highlights the same misconceptions and scepticism among HCPs. This indicates that such misconceptions and concerns are still unchanged and un-addressed. This jeopardises wide spread use considering that telehealth implementation is a complex innovation that needs to be driven by supportive staff. [14,27]

Barriers reported in this study were not distinct to those previously reported in the literature among different HCPs including nurses and GPs. [7,14,17,28] Problems associated with cost and funding and lack of resources in particular time and workload were the most frequently reported barriers. Pharmacists' perceptions about the barriers were not distinct from those reported by the other HCPs. This further highlight the need to tackle such barriers to promote telehealth implementation based on the established evidence in the literature.

Facilitators for telehealth implementation were also identified in this study; funding and investment in resources were reported by participants irrespective of experience, sector and discipline. Raising awareness and education among HCPs and patients were also highlighted as crucial. Enhancing staff acceptance and the other facilitators provided were previously identified in the literature. [7,14,29].

Conclusion

The current study highlighted that the experience and awareness level of telehealth is still low especially among HCPs working in primary care settings. Barriers identified are still the same evidence-based barriers reported in the literature and were mentioned by the participants irrespective of experience and sector. This highlights the need for a systematic strategy in tackling such barriers if telehealth implementation is to be promoted in the UK. In

addition, this paper highlights that the same misconceptions raised previously in the literature among HCPs concerning telehealth implementation still exist. Addressing HCPs' scepticism and misconceptions is another crucial issue since no successful implementation can occur without having supportive staff.

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Table 1

Staff disciplines	**Number of participants**
General practitioners (GPs)	4

Medical doctors (MDs) (from Croydon University Hospital and Royal Marsden Hospital)	4
Community pharmacists (CPs),	14
Community nurses (CNs)	7
Hospital nurses (HNs)	4
Hospital pharmacists (HPs)	2
CCG pharmacist	1
Total	36

Table (1) Participants disciplines

Appendix (1)

Interview schedule

Section one - Telehealth concept awareness

1. What have you heard about telehealth?

Prompt: Define the concept of telehealth if the participant is not aware of the concept

2. What does telehealth mean to you as a healthcare professional?
3. Have you used telehealth in your clinical practice?

If Yes, proceed with questions 4-9. If No, proceed with questions 10-16

Section two – Clinical Experience

4. How has your experience been?
   a) In which area in clinical practice was telehealth implemented?
5. What were the observed benefits?
6. What were the barriers for the implementation?
   Prompt: Worries, misconceptions, patients, healthcare professionals
7. How did you overcome the mentioned barriers?
8. How would you do it differently next time?
9. Do you want to include anything?
10. Which area of care do you think telehealth will be of potential benefit?
    Prompt: How can these factors benefit your patients care?
11. In your opinion, what are the potential advantages of telehealth services for your practice and your patients?
12. In your opinion, what are the potential disadvantages of telehealth for you and your patient and the services?
    Prompt: What do you think about using digital medium, like the use of mobile phone to monitor and share patient health information?
13. How can telehealth be integrated in the current patient care pathway?
14. Can you please tell me why you think the implementation of telehealth in the UK has not significantly developed even though studies have shown a great improvement in healthcare?
15. Can you explain the barriers for the implementation of telehealth?
    Prompt: Education, training, funding and so on.
16. Can you identify the facilitators that could benefit the implementation of telehealth services in the UK at a larger scale?

Do you have any other comments about what we have discussed regarding this topic?