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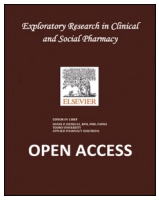

Telepharmacy for outpatients with cancer: An implementation evaluation of videoconsults compared to telephone consults using the CFIR 2.0

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ABSTRACT

Background: Medication history telepharmacy consults are conducted prior to patients commencing their systemic anti-cancer therapy. At the study institution, this has historically been carried out as an unscheduled telephone consult. However, due to challenges with telephone consults, a scheduled videoconsult model was established. Funding, time efficiency, and completion rate for videoconsults compared to telephone consults have been examined previously.

Objective: The aim of this study was to determine staff perceptions of the factors that influence implementation, including enablers and barriers, for videoconsults compared to telephone consults, to inform model sustainability.

Methods: Semi-structured interviews were conducted with staff ($n = 14$) involved with the videoconsult service, or who provided care for patients who had a videoconsult. Interviews were coded for positive or negative influence and strength using the Consolidated Framework for Implementation Research (CFIR) 2.0, to understand which constructs influence implementation.

Results: Thirty-nine of the 79 constructs, from across four domains were identified as influences for the telephone and videoconsult models. Six constructs were strongly differentiating for videoconsults over telephone consults. Of the 25 positively influencing constructs for the videoconsult model, strongest ratings (+2) were given for innovation advantages, critical incidents, support persons assisting in the consult, financing related to funding reimbursement, and telehealth coordinator capability and motivation. Barriers unique to the videoconsult model included the many steps that were involved, compatibility with workflows, and pharmacist resource. Similarities and differences unique to each model were identified.

Conclusion: Findings demonstrated a number of strongly differentiating constructs highlighting superiority of the videoconsult model. However, implementation of both models had multiple enablers and barriers that may influence adoption. The potential of a hybrid service, using both telephone consults and videoconsults, may help optimise delivery of services.

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1. Introduction

Prior to a patient commencing a cancer therapy protocol, a pre-treatment medication history must be completed by a cancer pharmacist.[1,2] Completing an accurate medication history facilitates any medication safety, quality, or efficacy issues being resolved prior to the first systemic anti-cancer treatment (SACT) cycle.[1,3] Medication histories can be gathered in person or remotely by telepharmacy, which involves the use of technology to deliver pharmacy care from a distance.[4–6] Telepharmacy has been broadly adopted internationally to improve access to healthcare and minimise disease transmission.[6–10]

Telepharmacy can be clinically effective[11–14] and cost-effective.[15] At the study institution, the current way of obtaining medication histories using telepharmacy, is via an unscheduled telephone consult model.[13] These unscheduled telephone calls are inefficient because pharmacists have trouble connecting with the patient and need to make repeated calls, patients are unprepared, and pharmacists are unable to visually verify information.[13,16] These multiple challenges can result in service inefficiencies and sometimes on a patient's first treatment day, medication-related issues may still be unresolved.[13,16] To address these challenges, a scheduled videoconsult telepharmacy service model was established.[13] Recent service evaluation of these two telepharmacy models has revealed a higher successful completion rate[16] and higher funding available[13] for videoconsults compared to telephone consults, with equivalent time efficiency for consult duration.[13] In addition, there were favourable perceptions of videoconsults among pharmacists, patients, and their support people, such as this modality facilitating the ability to view and read a medication container or label, and in enhancing communication.[16] While those studies have demonstrated potential benefits of videoconsults in terms of efficacy[16] and costs,[13] any issues associated with the implementation of videoconsults compared to telephone consults, have not yet been examined.

Prior implementation evaluation studies in telepharmacy[17,18,20] have successfully applied the Consolidated Framework for Implementation Research (CFIR), an implementation science framework, to examine the potential enablers and barriers of implementing a specific innovation.[21,22] One study used the CFIR to identify implementation strategies for medication reconciliation.[17] Another applied the CFIR to support an oral anti-cancer medication adherence intervention.[18] The third study applied the CFIR to develop recommendations to improve hospital engagement for discharge medicines review referrals.[20] In each of these studies the benefits of using an implementation framework to identify positive drivers, as well as challenges to service implementation, were reported. Understanding these features can help institutions enhance their existing services, while also advise other services seeking to adopt similar models, to use implementation strategies to optimise service success[23,24] To the knowledge of the authors, no study to date has examined the influences for successful implementation of telepharmacy videoconsults compared to telephone consults using the CFIR 2.0.

The aim of this study was therefore to determine staff perceptions of the factors that influence implementation, including enablers and barriers, for the videoconsults compared to telephone consults using the CFIR 2.0,[22] to support ongoing sustainability within the current service.

2. Method

This study received ethics approval from the Metro South Health Human Research Ethics Committee HREC/2020/QMS/60017. All participants provided written informed consent.

2.1. Study setting

The cancer pharmacy, part of a metropolitan cancer service providing care to a high volume of patients, is where the unscheduled telephone consults by the pharmacists take place. Due to the identified challenges of telephone consults, an alternative model of videoconsults was established and provided for 1 year and 9 months, during the peak of the COVID−19 pandemic.

2.2. Videoconsult service

Patients and support people were invited to participate in a videoconsult following a discussion with a medical oncologist regarding the treatment plan. Of the 92 patients invited, 81 (88 %) chose to participate. Those who declined were offered the usual care model of an unscheduled telephone consult. The videoconsult service involves pharmacists obtaining a pre-treatment medication history from a patient (+/− a support person), within seven days prior to treatment during business hours on weekdays. Following a patient consenting to a videoconsult, a telehealth coordinator telephoned the patient/support person to provide information regarding the pharmacist videoconsult, organise the appointment, and send the videoconsult link. Pharmacists conducted the videoconsults in rooms that were not co-located with the cancer pharmacy. Patients (+/− their support people) participated in the videoconsult from their chosen location (e.g., home or work). There was free access to this telehealth infrastructure, equipment, and support for the pharmacists.

2.3. Participants identification

Staff were recruited over four weeks to take part in semi-structured interviews using purposive sampling. Inclusion criteria included staff from four professions- pharmacists, nursing staff, medical officers and telehealth coordinators. To be eligible for inclusion, the pharmacists must have delivered videoconsults and telephone consults. The nursing staff and medical officers were eligible if they were caring for patients in the clinic who had either pharmacist telephone consults or videoconsults and had knowledge of the pharmacist videoconsult model of care, and who themselves had delivered telephone consults and possibly videoconsults. The telehealth coordinators were eligible if they organised and provided technical support for the videoconsults and had knowledge of the telephone consult workflow.

2.4. Data collection

To ensure all participants felt free to discuss their perceptions of the telepharmacy models, an independent research assistant conducted the semi-structured interviews, held over 12 weeks from May to September 2022. The CFIR interview guide tool[25] was used to develop the questions for the semi-structured interviews. The semi-structured interview guide included a short section of closed-ended demographic questions, followed by a series of open-ended questions (Supplementary File 1). The open-ended questions were used to elucidate staff perceptions of the implementation of the usual care telephone consult and videoconsult models. Participants were able to speak freely on aspects deemed important to them, and were probed on parts of their narrative to understand the potential influence of CFIR 2.0 constructs.[22] Some questions were omitted during the interview if they were deemed irrelevant to the role of the staff member. All interviews were conducted in person, recorded, transcribed, then checked for accuracy against the recorded interview.

2.5. Data analysis

The four CFIR 2.0 domains of Innovation, Outer Setting, Inner Setting, and Individuals were considered against the transcripts from the semi-structured interviews.[26] The Implementation Process Domain was not considered in this study. Telephone consults are the current model of service delivery, but for the purpose of comparison, constructs from all four of the domains, including the Innovation Domain, were applied to both the telephone consult and videoconsult models. In this study, the

Outer Setting related to the hospital, State, and Country, while the Inner Setting related to the locations the telepharmacy service was carried out in, as well as associated areas such as cancer services.

Some modifications were made to how constructs were rated to ensure that the perspective for each domain and construct was accurately described. Four constructs were separated out into two categories (two separate constructs). The constructs of Structural Characteristics - Information Technology Infrastructure, Materials and Equipment, and Access to Knowledge and Information were separated into patient and staff perspectives. While Innovation Cost was separated into patient and health service categories (two separate constructs). Furthermore, the construct of Complexity was renamed to Simplicity, so that favourable responses indicating Simplicity were scored positivity (rather than negatively, had the scoring been against complexity) following the example of previous CFIR analyses.[27] In addition, the Critical Incidents construct descriptor was edited to add "do not" such that again, the construct would score positively if critical incidents did not impact the innovation. Applying reverse ratings to these two constructs ensured consistency with other constructs where positive scoring indicating favourability.

Two authors (MR and EW) first independently analysed three blinded interview transcripts and then compared findings to confirm consistency in coding of content against the CFIR 2.0 domains and constructs.[26] The coding was completed separately for both the unscheduled telephone model and the innovation (scheduled videoconsult model). Four of the authors (MR, EW, CS, and CC) then met to discuss the coding of the 3 transcripts, to identify any coding disagreements, to ensure a consistent coding approach. The remaining transcripts were then coded by a single author (MR). To ensure consistency and reliability of coding was maintained, randomly selected paragraphs from across the participant transcripts were checked and coded by a second rater (EW), with any disagreement reconciled by discussion with a third author (CS).

Interview statements pertaining to CFIR 2.0 constructs were identified for each participant, and then rated for direction (positive to negative manifestation) and strength (influence = 1, or strong influence = 2), applied. A score of X indicated a mix of both positive and negative manifestation for the construct, and 0 indicated that the construct was noted to be an important consideration but was found to be neutral.[22,25] An overall score was then determined from review of all individual participant scores against any identified constructs for the unscheduled telephone model, and the scheduled videoconsult model. Positive scoring constructs (identified by being a positive influence [+1] or strong positive influence [+2]) were considered enablers, while negative scoring constructs (identified by being a negative influence [−1] or strong negative influence [−2]) were considered barriers. Following separate analysis of each model, the construct scores for both models were compared and any strongly distinguishing scores were identified. A strongly distinguishing score was determined as where the scores for the 2 models differed by 3 or more places from each other, e.g. −1 and + 2, or with a − 2 or + 2 and X (X = mixed influence) for any one construct. Example quotations have been included in the results to illustrate discussions of key constructs, with participant number indicated in parenthesis beside the quote.

3. Results

Fourteen staff members, involving 3 or more participants from the 4 professions, consented to participate (Table 1). The group was deemed adequate in size based on published recommendations[28] and was representative of the diversity of roles engaged with the models. Participants demographics reflected the workplace in general in terms of a wide-ranging age and experience level, and a mostly female workforce.

Table 1
Participants demographics

Demographic characteristic	Number of participants *n* (%)
Age	
18–30	2 (14 %)
31–50	10 (71 %)
51–75	2 (14 %)
Gender	
Female	13 (93 %)
Male	1 (7 %)
Highest education/ training level	
University Bachelor degree, or Diploma	3 (21 %)
Post-graduate degree	10 (71 %)
Completed senior high school	1 (7 %)
Role at hospital	
Cancer Pharmacist or Rotational Pharmacist	5 (36 %)
Medical Oncologist	3 (21 %)
Nurse Practitioner, Clinical Nurse Consultant, Nurse Unit Manager	3 (21 %)
Telehealth Coordinator	3 (21 %)
Number of years of practice in the profession or work stream	
1 to 5 years	4 (29 %)
6 to 10 years	3 (21 %)
11 to 15 years	1 (7 %)
16 to 20 years	3 (21 %)
21 years or more	3 (21 %)
Number of years working in cancer services if pharmacist, nurse, doctor	
Less than 1 year	2 (18 %)
1 to 5 years	3 (27 %)
6 to 10 years	0 (0 %)
11 to 15 years	3 (27 %)
16 to 20 years	2 (18 %)
21 years or more	1 (9 %)

3.1. CFIR 2.0 constructs identified from the transcripts

Constructs identified within the interview transcripts from the four domains, for both the telephone consults and videoconsults, are shown in Table 2. Including the additional "separated" constructs created for this analysis, a total of 39 constructs were identified out of a possible 79. Several strongly positive constructs (i.e., +2 ratings) were identified for the videoconsults ($n = 6$) compared to telephone consults ($n = 1$). For the four constructs of Innovation Relative Advantage, Innovation Design, Financing, and Structural Characteristics for Support Persons, there was a strongly distinguishing difference in scores between the ratings for the telephone consults versus videoconsults, with superior ratings for the videoconsult model (Table 2).

3.2. Perceived enablers

Positive influencing constructs (or enablers) identified for both the telephone consult service and videoconsult service were Critical Incidents not disrupting telepharmacy implementation and delivery, Local Attitudes supporting the innovation implementation, Relational Connections of staff, Communications between the telepharmacy-related environments, Culture relating to Human Equality for Centredness which is the shared belief of the equal worth of individuals, and Innovation Recipients for Need relating to a requirement a patient has which will be addressed by the telepharmacy models (Table 2). A higher number of positive influencing constructs were identified for the videoconsult model ($n = 25$) than for the telephone consult service ($n = 10$). The strongest enablers out of the 25 positively influencing constructs identified for the videoconsult service were Innovation Relative Advantage, Critical Incidents, Structural Characteristics for Support Persons assisting with the consults, Financing which is funding reimbursement available, and Other Implementation Support for Capability and Motivation to deliver the telepharmacy model, which are discussed

Table 2
CFIR constructs identified and overall rating for telepharmacy consult type.

CFIR domain and constructs with shorted description[21]	Overall rating	
	Telephone consult	Video-consult
Innovation Domain		
Innovation Evidence-Base	–	+1
The innovation has robust evidence base supporting effectiveness.		
Innovation Relative Advantage*	−1	**+2**
The innovation is better than other available innovations/current practice.		
Innovation Simplicity#	+1	−1
The innovation is simple, reflected by its scope/ nature/steps.		
Innovation Design*	**−2**	X
The innovation is well designed and packaged.		
Innovation Cost~		
The innovation purchase and operating costs are affordable.		
Recipient	**+2**	0
Health service	+1	−1
Outer Setting Domain (e.g., hospital, State, Country)		
Critical Incidents~	+1	**+2**
Large-scale and/or unanticipated events do not disrupt implementation and/or delivery of the innovation.		
Local Attitudes	+1	+1
Sociocultural values/beliefs encourage Outer Setting to support innovation implementation and/or delivery.		
Local Conditions	−1	+1
Economic, technological etc. conditions enable Outer Setting to support innovation implementation and/or delivery.		
Financing*	−1	**+2**
Funding from external entities (e.g., grants, reimbursement) is available to implement/deliver the innovation		
Inner Setting Domain (e.g., cancer pharmacy, telehealth centre, cancer services)		
Structural Characteristics– Other (ability of support persons to assist in the consult)*	X	**+2**
Infrastructure components support functional performance of the Inner Setting		
Structural Characteristics– Physical Infrastructure	−1	X
Layout/configuration of space/other tangible material features support Inner Setting functional performance		
Structural Characteristics~– Information Technology Infrastructure		
Technological systems for telecommunication, documentation etc. support Inner Setting performance.		
Staff member	−1	X
Patient	−1	−1
Structural Characteristics– Work Infrastructure	X	−1
Organisation of tasks and responsibilities and general staffing levels, support Inner Setting performance.		
Relational Connections	+1	+1
High quality relationships, networks, and teams within and across Inner Setting		
Communications	+1	+1
High quality information sharing practices within and across Inner Setting		
Culture– Human Equality-Centeredness	+1	+1
Shared values, beliefs, and norms about the inherent equal worth and value of all human beings.		
Culture– Recipient-Centeredness	−1	+1
Shared values, beliefs, and norms around caring, supporting, and addressing recipient needs and welfare.		
Culture– Deliverer-Centeredness	−1	+1
Shared values, beliefs, and norms around caring, supporting, and addressing deliverer needs and welfare.		
Compatibility	+1	−1
The innovation fits with workflows, systems, and processes.		
Incentive Systems	–	+1
Tangible/intangible incentives and rewards/ disincentives support innovation implementation and delivery		
Available Resources– Funding	−1	−1
Funding is available to implement and deliver the innovation.		
Available Resources- Space	−1	−1
Physical space is available to implement and deliver the innovation.		
Materials & Equipment~		
Supplies are available to implement and deliver the innovation.		
Staff member	−1	+1
Patient	X	X
Access to Knowledge & Information~		
Guidance/training is accessible to implement/ deliver innovation.		
Staff member	X	+1
Patient	—	+1
Individuals Domain		
Mid-level leaders– motivation	–	+1
Individuals with a moderate level of authority are committed.		
Implementation Leads (pharmacist innovation lead)– motivation	–	+1
Individuals who lead efforts to implement the innovation are committed.		
Other Implementation Support (telehealth coordinators)– capability	–	**+2**
Individuals who support the Implementation Leads/Team Members have interpersonal competence, knowledge, skills.		
Other Implementation Support (telehealth coordinators)– opportunity	–	+1
Individuals who support the Implementation Leads/Team Members to have availability, scope, power.		
Other Implementation Support (telehealth coordinators)– motivation	–	**+2**
Individuals who support the Implementation Leads/Team Members are committed.		
Innovation Deliverers (pharmacists)– capability	−1	X
Individuals directly/indirectly delivering the innovation have interpersonal competence, knowledge, skills.		
Innovation Deliverers (pharmacists)– opportunity	0	−1
Individuals directly/indirectly delivering the innovation have availability, scope, power.		
Innovation Deliverers (pharmacists)– motivation	–	+1
Individuals directly/indirectly delivering the innovation are committed.		
Innovation Recipients (patients)– need	+1	+1
The individual(s) has deficits related to survival, well-being, or personal fulfillment, which will be addressed by innovation implementation and/or delivery.		
Innovation Recipients (patients)– capability	X	+1
The individual(s) has interpersonal competence, knowledge, and skills.		
Innovation Recipients (patients)– opportunity	−1	+1
The individual(s) has availability, scope, and power.		

Note: Strength of influence: (—) not discussed, (0) neutral, (1) influence, (2) strong influence, (X) mixed influences. Direction of influence: (−) negative, (0) neutral, (+) positive.
Bold indicates a score that was a strong positive or negative influence construct.
CFIR = Consolidated Framework for Implementation Science.
[#] Reverse rated; innovation 'simplicity' used rather than 'complexity'.
[^] Reverse rated; the words 'do not' were added to the construct.
[~] Construct has been further separated out to distinguish between individuals/organisation.
[*] Construct has a strongly distinguishable influence between telephone consults and videoconsults.

below.

3.3. Innovation domain

For videoconsults, the Innovation Relative Advantage construct was a strong positive influence (+2), while for telephone consults, it was a negative influence (−1). Discussions covered many types of advantages but focused primarily on the increased capacity for communication with non-verbal cues, patient preparedness for the consult, and the advantage of having visual information in the videoconsult.

Strong positive quotes from participants regarding the relative advantage of the videoconsult for communication and rapport were, *"Much more personable…you can see the facial expressions" (P3)*. Another participant discussed that improved communication can potentially improve medication management: *"Face-to-face, they revealed more than they would over the phone…" (P4)*. Improved communication for certain groups of patients was also identified: *"It's useful for hard of hearing patients if they lip read. [Also], for patients that have a disability or cognitive impairment, because you can easily have others join in that consult. Also, [same for] patients who are from non-English speaking backgrounds" (P1)*.

Participants also noted that the patient was prepared and ready for the videoconsult: *"[the patient]… had considered what kind of questions we would ask" (P4)*. There was also the visual advantage to identify medications via videoconsult: *"If the patient is unable to … read the medication label… they can hold it up to the camera" (P1)*. Efficiency *"[It] saves time…" (P4)* and "*Funding" (P2)* were also noted advantages by many participants.

Although there was an overwhelming amount of quotes of positive influence, there were some negative points, such as: *"May not be private to do a videoconsult if the… computer or internet field is in a shared area" (P8)* and *"Some patients may feel they need to get dressed and put make up on, so more effort [is] required for a videoconsul]" (P8)*.

For telephone consults, Innovation Relative Advantage related to several comments on *"Convenience" (P8)* from the perspective that the pharmacist can make the call when they are ready, and that for the patient, there was *"Ease of picking up a phone, most patients can use a phone" (P3)*. However, most of the discussion was negative, and related to an inability to contact the patient or the inability of the patient to provide the required information, such as: *"A lot of the time they won't answer, which is a waste of time for everyone" (P4)*, or *"The patient could be at work, could be driving…[and] they may not want to give out too much information due to [information being] confidential" (P7)*.

3.4. Outer setting domain

Regarding the outer setting, two constructs were positive enablers (Table 2). The Critical Incidents construct was strong for videoconsults which provided "*A safe way to deliver care infection risk wise, patients could communicate without wearing a mask" (P1)* during the COVID-19 pandemic. Videoconsults also facilitated more support person involvement. Then Financing was also a strong construct, with many participants reporting the revenue advantage with videoconsults over telephone consults, *"For videoconsults, there's higher funding potential" (P1)*.

3.5. Inner setting domain

The Structural Characteristics relating to Support Persons construct was used to code the advantage of having support persons to assist in the videoconsult (Table 2), as opposed to in a telephone consult, which was discussed several times: *"The support person helped the patient with their medication list" (P4)*.

3.6. Individuals domain

The constructs Other Implementation Support for Capability and Motivation were used to capture the comments about the local telehealth supports which were a strong positive influence on the overall success of the service *"Telehealth Coordinators were motivated to troubleshoot any issues" (P1)*.

3.7. Perceived barriers

Although the videoconsult model was positively viewed by the participants, a number of issues for both telephone consults and videoconsult services were identified, highlighting issues to consider/correct/modify when designing and implementing both models. Regarding Information Technology Infrastructure for the Patient, issues related to having an appropriate working device and internet access for participating in the telepharmacy service as there were issues with Funding and Space to implement and deliver the telepharmacy service that had to be overcome. Structural Characteristics relating to Work Infrastructure which pertains to organisation of tasks and general staffing levels, was also seen as a barrier for videoconsults and had a mixed overall scoring for telephone consults. Barriers that were identified specifically for the videoconsult service only, were Innovation Simplicity, Innovation Cost for the Health Service, Innovation Compatibility with workflows, and Innovation Deliverers (the pharmacists) for Opportunity to deliver the consult. However, these were only of negative influence (−1) rather than strong negative influence (−2). There was one negative strong influence (barrier) identified for telephone consults which was Innovation Design.

3.8. Innovation domain

For videoconsults, the construct Innovation Simplicity had negative discussion as it involved many steps for both staff and the patient, *"Need to get in touch with telehealth coordinators to organise an appointment… and the pharmacist needs space booked to conduct the consult…for a patient with a new cancer diagnosis, a videoconsult might be too stressful" (P8)*. This contrasted with the telephone consults in which Innovation Simplicity was a positive influence.

Innovation Cost for the Health Service was a negative influence as it was highlighted that there is a *"Cost to the hospital for computers with webcams, and the IT infrastructure" (P12),* compared to cost for telephone consults which was scored a strong positive in this construct as *"Phone set up is less expensive" (P12)*.

For the construct Innovation Design, the telephone consult service was a strong negative: *"[They can] catch patients off guard…"* (P1). For videoconsults, there were mixed opinions, with one participant stating, *"The patient had an incorrect videoconsult link sent"* (P1), demonstrating an opportunity to refine a service process.

3.9. Inner setting domain

Several barriers were identified for the construct Structural Characteristics related to Information Technology Infrastructure for the Patient: *"[The] need to travel somewhere for stronger internet connection [or a] computer, smartphone and internet" (P8)*. Another participant spoke of their negative experience with a consult in which the *"Sound didn't work, [and I] had to use a phone for sound"* and added that *"Sometimes there's*

connection issues…" (P6). However, a participant noted that for telephone consults, *"Telephone connection in rural areas sometimes is poor" (P3)*, highlighting possible infrastructure issues with the telephone modality as well.

Discussion from the Structural Characteristics related to Work Infrastructure construct which refers to the organisation of tasks and staffing levels, included: *"Need enough pharmacist resource to be able to attend videoconsults without affecting the pharmacist role in the day treatment unit" (P2)*. The quote also fits with the Compatibility and Innovation Deliverers for Opportunity constructs. Telehealth coordinator staffing was also discussed: *"The biggest thing to ensure the success of videoconsults would be the extra telehealth coordinator/administration that would be needed…to ensure that telehealth coordinator staff are always available…" (P2)*. While overall this construct scored −1 for the videoconsult service, it was scored X for telephone consults to indicate mixed responses due to both positive and negative comments raised.

There were issues noted for videoconsults for the Compatibility construct, regarding workflows: *"A patient forgot to connect for their consult, so I called tried telephone calling them 3 times…I contacted the telehealth coordinator to reschedule the videoconsult" (P3)*. Another participant noted that *"A text message reminder with the link to the videoconsult on the consult day would be good so patients can easily find the link" (P1)*. It was also noted for videoconsults that they are *"Not as flexible as telephone as they can't be just fit in whenever…" (P13),* and *"[The] location for [conducting] videoconsults is not near pharmacy" (P6)*. In contrast, the telephone consult model which scored +1 overall for this construct due to many positive and some mixed statements: *"Telephone consults are flexible with when the call can be made" (P13),* and *"[Telephone consults] fit into the workflow as they are done in the cancer pharmacy, but sometimes it's difficult to hear" (P3)*.

For both models, the construct Available Resources related to Funding to implement or deliver the innovation was considered a negative influence. For videoconsults this was influenced by concerns with pharmacy staffing: *"Need funding for pharmacist resource to be able to attend the videoconsults without affecting patient counselling since those activities occur in different locations",* (P2). For the telephone consults service, there were also multiple staffing issues raised *"Need more administration officer support to claim the activity-based funding for the telephone consults… staff resources could be financed with the increase in activity-based funding generated"* (P3).

3.10. Individuals domain

Some negative comments were raised for the Innovation Deliverers for Opportunity construct regarding the pharmacists having ability to deliver videoconsults, including adhering to consult schedules, *"Pharmacist needs to be available for the consult, [however], sometimes there may be competing tasks, e.g., education and counselling an outpatient [in person], at the same time as a scheduled videoconsult"* (P1). However, one participant offered an efficiency to combine the medication history consult and the education and counselling *"[For select patients] we could do the education and counselling in a videoconsult. …On their treatment day, it would make it efficient, because then they would just collect the medicines that they've already been educated and counselled"* (P1).

4. Discussion

In line with other telepharmacy implementation studies that have applied the CFIR framework[17,18] multiple constructs were found to be of influence, highlighting that many may affect the success of telepharmacy service implementation. The telephone consult and the videoconsult models had some similar, as well as different, enablers and barriers. This information is vital when considering the sustainability and future of both models within the hospital pharmacy setting. More specifically, because both have advantages and challenges, it raises the question whether a single model is the optimal solution, or if perhaps a hybrid model, combining both options, may work best for service delivery. The key issues to consider in telepharmacy design and implementation are discussed below.

4.1. Considering overall advantages of each telepharmacy model

Advantages and disadvantages for each telepharmacy model were the predominant discussion points by participants. The relative advantage construct was also a main influencing factor in other telehealth studies applying the CFIR framework,[29,30] indicating that advantages of an innovation over the usual model of care may strongly relate to innovation implementation success. Advantages or positive influences such as communication, the advantage of having visual information, and consult reimbursement were examples unique to videoconsults and the overall positive perception of that model. However, these need to be balanced with potential issues such as the extra steps involved in setting up the videoconsult and impacts on workflow. For the telephone consults, although the convenience for the pharmacist of just picking up a telephone at any time it suits them and the ability of most patients being able to use the telephone were key enablers for this model, there were more important disadvantages, such as an inability to visually verify medications and the decreased capacity for communication and rapport, which outweighed the advantages.

4.2. Patient considerations and support needs

Consideration of patient factors such as access to required technology and the ability of the patient to participate in the telephone consult or videoconsult models, may influence telepharmacy service model success. A systematic review comparing randomised controlled trials of telephone consult and videoconsult models similarly found a patient factor, the patient's belief in their capacity to participate in a videoconsult, a challenge with videoconsults.[31] One of the most mentioned enablers was the value of a support person contributing during the videoconsult, this has been noted in previous studies.[32] These findings can assist with identifying patients that may benefit most from videoconsults, such as those who have a disability, have complex medication regimes, do not manage their medicines, or who are from a non-English speaking background.

4.3. Staff and operational requirements

Influences related to the staff featured heavily, such as pharmacist availability to deliver the videoconsult and the proximity of where the videoconsults are carried out with respect to their other work locations. Telehealth technical support for patients and staff, as well as administration support for recording appointments necessary to access external financing (activity-based funding), are key influencing factors on success also. Staffing resources was also noted to be a challenge and a key influencing factor in other pharmacy[18,24] and telehealth CFIR studies.[18,24,29] Further on staffing, in a pharmacist discharge care intervention study that applied the CFIR, variable pharmacist skills for delivering the intervention was found to be a barrier to intervention implementation and sustainability. Though the current study did not identify variable skills as a barrier, it is important to note this finding as it reinforces the need for training and education to facilitate consistent high quality delivery of pharmacist services.[24]

Operationally, the results showed equipment availability was an enabler for videoconsults; this was in contrast to findings from a systematic review comparing telephone consults to videoconsults which found access to videoconsult equipment was a challenge for feasibility.[31] This is important to consider, as access to equipment may be a challenge for services utilising shared resources for videoconsults where service demand may increase.

4.4. Funding opportunities

Like other telepharmacy implementation studies using CFIR, this study demonstrated the value of staff-informed implementation evidence, with solutions being offered to barriers by participants,[17,18,20] including funding and staff resource challenges. One solution was that activity-based funding generated from the videoconsults could fund additional pharmacist staff to overcome the barrier of staff having competing priorities. Another suggestion was that this funding could also be used to fund additional telehealth coordinator support to change the unscheduled telephone model to a scheduled model and hence ensure that funding was being generated for activity provided. Scheduling the telephone consults could potentially improve the successful completion rate of the consult, as highlighted in another study which found unscheduled telephone consults had a statistically significantly worse completion rate than videoconsults.[16] Further research, including implementation research, into a scheduled telephone consult model is recommended.

4.5. The impact of COVID-19 and other potential critical incidents

The perceived positive impact of videoconsults during the COVID-19 pandemic has been noted in other studies which discussed access to healthcare and reduction of infection risk as benefits from utilising telehealth during emergency and disaster situations.[16,32–35] While planning an intervention implementation, it may be useful to prospectively consider the possible critical incident types that may occur, e.g., environmental and biological,[33] and what impact they could potentially have on the intervention, and if negative, consider how they can be mitigated or managed. While both telepharmacy models provided a safe way to deliver care during COVID-19, if attempts for a telepharmacy consult are unsuccessful, it necessitated a less safe face-to-face interaction between the pharmacist and the patient to gather outstanding details on treatment day at the hospital. In this scenario, attempting a videoconsult first which has a higher success rate than telephone consults, could decrease the occurrence.[16] Although videoconsults were superior in the COVID-19 context, and the pandemic increased telehealth acceptability,[36] other strengths of the videoconsult model discussed above, support ongoing use beyond the pandemic.

4.6. Limitations

It is possible that not all implementation issues were explored in the CFIR 2.0 Framework-designed semi-structured interview questions. Another limitation of the study is that patients and support people who were involved in the consults were not invited to participate, however their valuable perceptions about the videoconsult service have been explored elsewhere.[16] Future research should seek to include patients and support people in interview cohorts.[37]

5. Conclusion

The findings of this study can be used in tailoring of implementation strategies and required adaptations for this institution, as part of providing an optimised and sustainable service. Overall, results demonstrate videoconsults should be used where possible, and there are certain patient groups that may benefit most from this model. However, due to both models having multiple enablers and barriers, further research into other models, including the potential of a hybrid service using both telephone consults and videoconsults, may best meet the needs of patients and the organisation. External to this service, health services leaders can consider the many factors which may influence implementation success of each telepharmacy model, when considering telepharmacy service design and implementation.

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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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Appendix A. Supplementary data

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