Community pharmacists' perceptions of a hospital based virtual clinical pharmacy service: Findings from qualitative research

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A R T I C L E   I N F O

A B S T R A C T

Background: A Virtual Clinical Pharmacy Service (VCPS) was introduced in selected rural and remote NSW hospitals in 2020 to address a gap in onsite clinical pharmacy services. Follow-up research determined hospital staff and patients at these locations perceived the service as a safe, effective and efficient system for delivering clinical pharmacy services. Community pharmacists are key stakeholders in medication safety and continuity of management in these regions, however, their insight on the VCPS had not yet been sought.

Objective: To understand perspectives of community pharmacists on the implementation of VCPS in rural and remote hospitals and impacts on medication management at transitions of care.

Methods: Semi-structured interviews were conducted via videoconference with seven community pharmacists with at least three months exposure to VCPS following service implementation. Thematic analysis of transcribed interviews was conducted influenced by Appreciative Inquiry.

Results: Participants identified that the VCPS had supported and enhanced their community pharmacy practice and acknowledged its future potential. Identified themes were interaction with VCPS, acceptability of VCPS, community pharmacy workflow, and involvement in patient care. Suggested improvements included involving community pharmacists early in the implementation of the service and establishing clear expectations and procedures.

Conclusions: The experiences of community pharmacists with VCPS were positive and there was a consensus that the introduction of the service had assisted interviewees in providing medication management to patients at transition of care. The ease of communication and efficiency of the service were recognised as key factors in the success of VCPS for community pharmacists.

1. Introduction

The use of medication is the most common treatment applied in healthcare[1] and improves overall health outcomes when employed and managed appropriately.[2] The medication management cycle refers to processes that guide medication provision to consumers and involves a range of healthcare providers to ensure the safe, effective, and efficient use of medications throughout a patients journey of care.[3] The nine components of this cycle include: decision to prescribe medication, record of medication order, review of medication order, issue of medicine, provision of medicine information, distribution and storage, administration of medication, monitor for response, and transfer of verified information. A crucial moment for medication safety in patient care is at "transition of care" whereby patients move between care settings, often

from hospital back into the community, as more than 40% of errors occur during these transitions.[4] Hospital pharmacists, also referred to as clinical pharmacists, are unique as they have an established role at every step of the medication management cycle while patients are in hospital.[5] These pharmacists provide expertise in reviewing medication lists, staff and patient education, and medication reconciliation during transition of care.[6] In performing these crucial services, clinical pharmacists reduce medication errors which are a major avoidable cause of morbidity and mortality worldwide.[7] Hospitals in rural and remote regions often lack onsite clinical pharmacists due to challenges with recruiting pharmacists to these areas, significant geographical distance from major cities, and in some cases insufficient patient volumes to justify funding these roles.[8] While community pharmacists are employed in private practice and funded by a mix of private income and

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government funding, clinical pharmacists are funded by state governments who must justify the costs vs benefits of employing these pharmacists in smaller towns.[9] In 2019, there were 89 practicing pharmacists per 100,000 population in Australia which is slightly above the OECD (Economic Co-operation and Development) average of 86 per 100,000 population.[10] However, there is an uneven distribution with 109 per 100,000 population in metropolitan areas compared to 75 per 100, 000 in non-metropolitan regions. Several factors, including a decline in growth in this profession, are predicted to result in an undersupply of pharmacists which will further impact the distribution of pharmacists in rural areas.[11]

To address this gap in healthcare, Western NSW Local Health District (WNSWLHD) implemented Virtual Clinical Pharmacy Services (VCPS) for inpatients at small hospitals in this region. This service commenced in April of 2020 utilising telehealth equipment to deliver bedside clinical pharmacy services remotely.[12] This service focuses on five steps for improving medication safety; referral and prioritisation, initial assessment and consultation, medication reconciliation and review, interprofessional care planning, and continuity of medication management.[12] Recent qualitative research has demonstrated that healthcare staff at these hospitals viewed the implementation of VCPS as an acceptable, effective, and efficient system.[13] Another study based in a metropolitan hospital ward demonstrated that the service was well utilised, detected medication errors at a rate comparable to in-patient clinical pharmacy services, and generated a high level of acceptance from both staff and patients.[14] Feedback from patients in rural and remote regions demonstrated a high rate of service acceptance and indicated that the VCPS improved medication compliance according to the national standards as well as detecting clinically important medication-related issues.[15] For ongoing medication management and healthcare provision upon transition back into the out-patient setting, community pharmacists are key stakeholders, especially in rural and remote communities.[16] Due to this funding model, Rural and remote community pharmacists have an expanded scope of practice as they are often the sole pharmacist in these towns and are relied on to carry out tasks usually provided by other health professionals in larger communities.[17] This expanded scope of practice includes coordinating supplies for palliative care patients, provision of vaccinations, and collaboration with Aboriginal Community Controlled Health Organisations.[11] As a consistent healthcare provider in these smaller communities, they often develop a close relationship with their patients and develop an extensive understanding of their medical history and healthcare needs, as well as support visiting healthcare professionals.[18] Despite their expanded role, community pharmacists are often under-represented in integrated care models, which act to reduce fragmentation between providers and streamline care coordination.[19]

While there have been studies demonstrating the high acceptability of VCPS for hospital staff and patients, the perspective of community pharmacists on the VCPS has not yet been sought. Due to their close links to the community and significant role in medication management in the out-patient setting, it is crucial that the perspectives of community pharmacists are integrated into the implementation of VCPS in rural and remote communities to ensure its enduring success.

This study aims to understand the perspective of community pharmacists on the implementation of VCPS in rural and remote hospitals and its impacts on medication management at transitions of care. It explores three main research questions: What has been the experience of community pharmacists with the VCPS, in what ways has the VCPS changes community pharmacy practice, and how has the VCPS changed medication safety at transitions of care?

2. Methods

2.1. Research team and reflexivity

Interviews were conducted by Author 1 (medical student with

experience working in community pharmacy setting) with prior training from Authors 2 (clinical pharmacist) and 4 (researcher) who have extensive experience and/or qualifications in qualitative research. Authors 2, 3 (medical director) and 4 had been involved in development and implementation of the VCPS. All authors live in a rural area.

2.2. Theoretical perspective

An inductive qualitative approach informed by Appreciative Inquiry guided the study. Appreciative Inquiry is a constructivist, participatory approach commonly used in organisational development. Employees or stakeholders are the participants who articulate their experience, suggest (dream) and design future (destiny) program directions. We used this strengths-based approach to design the study, prepare interview questions, inform analysis and shape recommendations.

2.3. Setting

This research was based in WNSWLHD, New South Wales (NSW) Australia. Community pharmacists were located in small rural towns, remote or very remote communities according to the Modified Monash Model classification.[20] The study area has an estimated population of 309,642 residents geographically dispersed over 441,949 km^2.[21]

Participant selection and recruitment.

Qualification criteria for participants included being a registered or intern pharmacist, employed by a community pharmacy in a location where VCPS has been operating for longer than three months. A list of all eligible community pharmacies was provided by Author 2, and contact details were verified by Author 1 on Healthdirect.[22] Pharmacies were ordered alphabetically, and a random number generator used to determine contact order.

Author 1 contacted all participants prior to conducting interviews to gain consent for participation. No participants were personally known to Author 1. All participants were informed that the interviews were being conducted as part of a research project with the potential development of a report for the local health district and submission to a journal for publication. The interviewer informed participants of their previous work role in community pharmacy.

All 14 pharmacies were called, eight pharmacists agreed to an interview and six declined. Each were emailed a participant information sheet with sufficient time to read and consider if they would like to participate. Participants were given an opportunity to ask questions prior to the commencement of the interview and provided verbal consent to participate which was audio recorded.

2.4. Data collection

Semi-structured interviews were conducted over videoconference using the online encrypted software, *Pexip,* either from the home or workplace of participants and audio recorded for transcription. No one else was present apart from participants and the facilitator. Seven pharmacists were interviewed with the eighth pharmacist interview not completed after two re-scheduling attempts.

Interview questions focused on the experience of the pharmacists with the program, the changes to community pharmacy practice after implementation, and how the VCPS has impacted medication safety and quality of patient care. Questions were provided to participants prior to the interview on the participant information sheet. The interview guide was not pilot tested. Field notes were made following each interview. Interviews were transcribed using an external transcription service, and no repeat interviews were conducted. Transcripts were not returned to participants for comment. Data saturation was observed when new data did not add further depth and research questions were addressed.

2.5. Analysis and findings

Transcripts were thematically analysed following steps outlined by Braun and Clarke[23] and guided by the step-by-step guide developed by Maguire and Delahunt[24] (Table 1). Data was coded from the interviews by hand, including independent coding from another investigator, a coding book and mind-map was generated using Microsoft word, and thematic analysis conducted via an inductive approach. The COREQ (consolidated criteria for reporting qualitative research) checklist for qualitative research was followed to ensure all required elements were included.[25]

Ethical review of the study was undertaken by the Greater Western Research Ethics Committee (reference number 2021/ETH01252).

3. Results

Seven interviews were conducted with full-time permanent community pharmacists between February and March 2022 (Table 2). Interviews ranged from between 13 and 26 min in length. Thematic analysis yielded four themes: interaction with the VCPS, acceptability of the VCPS, community pharmacy workflow and involvement in patient care.

3.1. Interaction with VCPS "…it's always good to have a fresh set of eyes over something." CP1

Community pharmacists interviewed expressed varying levels of exposure to and involvement with VCPS. From the seven interviewed participants, three expressed that they had limited contact with the service. This impacted their ability to speak on their experiences with and perceptions of VCPS in depth during the semi-structured interviews.

"I haven't got a lot of in-depth contact with the pharmacists that's been doing it." CP6.

The participants with greater involvement had a better understanding of the service and the role of the virtual clinical pharmacist. The initial exposure of the community pharmacists to VCPS upon its implementation in their respective locations was also varied. Some participants reported that a member of the VCPS team visited in person to explain the service, while others received a phone call or email, and some not recalling any initial contact.

"I really like the fact that [virtual clinical pharmacist] came and introduced himself… Because I do find as pharmacists, we receive hundreds of emails a day… But the fact that he came and introduced himself and told me about the program, that would be a really good start and I'd probably try aim to do that, if you could." CP1.

The communication between community and virtual clinical

Table 1
Description of analytic steps as guided by Braun and Clarke.[23]

Analytic steps suggested by Braun and Clarke	Analytic steps of the study
Familiarising yourself with your data	Transcripts were printed and read several times. Early impressions and thoughts from interviews were noted
Generating initial codes	Open coding was conducted by hand Author 1 with independent coding by co-investigator Author 4
Searching for themes	Codes were entered into a codebook on Microsoft Word and divided into themes using thematic maps
Reviewing themes	Themes were critically reviewed following feedback from co-investigator, and initial overlapping themes were combined
Defining and naming themes	Themes were defined and relevant names to describe core of the theme were developed
Producing the report	Report was written incorporating feedback from co-investigators

Table 2
Demographic characteristics and work locations for community pharmacists interviewed.

Participant number	Gender	Modified Monash Model Category	Modified Monash model description
CP1	Female	MMM5	Small rural town
CP2	Female	MMM5	Small rural town
CP3	Female	MMM5	Small rural town
CP4	Female	MMM5	Small rural town
CP5	Female	MMM7	Very remote community
CP6	Male	MMM5	Small rural town
CP7	Male	MMM5	Small rural town

pharmacists was perceived as very positive and the efficiency and accessibility of VCPS was praised by participants.

"There seems to be quite a quick, good line of communication there as well which is good." CP3.

Responses from community pharmacists demonstrated that in uncertain situations following patient discharge from hospital, they were able to contact the virtual clinical pharmacist for clarification and reassurance. The virtual clinical pharmacists were recognised as approachable, and most community pharmacists did not express any concerns regarding communication.

"When we have stressful moments and there's someone now that we can call and they can sort of help us work through discharging people safely, so we're grateful for their help." CP4.

One interviewee acknowledged that there were initial communication issues between a virtual clinical pharmacist and local doctor, in which the community pharmacist had also become involved. The interviewee reported that this conflict arose due to a lack of acknowledgement of the established health professionals in the community and their long-term therapeutic relationship with patients. The communication issues were resolved following a discussion between the community and virtual clinical pharmacist regarding communication and collaboration expectations.

"There were a few teething errors, teething difficulties at the start, which we managed to sort out along the way… it was a lack of acknowledgement that the doctor knew the patient better than a telehealth pharmacist." CP2.

3.2. Acceptability of VCPS "…I think it fills a gap of not having a hospital pharmacist there." (CP2)

Community pharmacists' perceptions of VCPS were overwhelmingly positive and all considered the service to be acceptable in their communities. Participants acknowledged that it addresses a gap in healthcare that rural and remote areas often experience and stressed the importance of having such services for bettering patient outcomes.

"I think, especially these days, with the lack of health professionals coming to the country, that we really do need to work on having those good clinical services in the small country towns, and country hospitals." CP2.

The consensus from interviewees was that an in-person clinical pharmacist would be ideal, however, most recognised that this would not be viable in their small towns and the virtual service was an adequate alternative.

"…We're a town of what, 3000 people, so there can't be a pharmacist at our hospital. It wouldn't be viable, So I guess this is the next best thing, isn't it, to provide that." CP4.

One community pharmacist raised the possibility of training local community pharmacists to provide clinical pharmacy services in their

respective town hospitals to improve continuity of care, while acknowledging that not all towns would have the capacity to do so. It was recognised that this training could be beneficial to patients, however, would not be realistic with the heavy workload experienced by themselves and many other small town community pharmacists.

"I think where there's capacity, you'd be better off to actually involve or train local pharmacists on the ground who are seeing the patients already and having them involved in the hospital…I think it's good to have that virtual service but I think working with local providers, especially in a small town, that's the strength of the local health system…" CP6.

3.3. Community pharmacy workflow *"…it's so much quicker and easier to get in touch with the appropriate person." CP3*

Participants expressed that the introduction of Virtual Clinical Pharmacy Services had improved the efficiency of their workflow and streamlined community pharmacy practice. They considered there were now fewer discrepancies in discharge summaries reviewed by the virtual clinical pharmacists, and it provided a relevant point of contact to discuss medication concerns.

"With the virtual pharmacy services, there's always someone available to look at that discharge, analyse it and a good point of contact as well." CP1.

Prior to the introduction of the service, community pharmacists reported that they were expected to follow up any issues or discrepancies themselves, with this task now being shifted to the virtual clinical pharmacist thereby reducing workload and saving them time.

"So instead of us having to make three phone calls to chase up the information, we just give it to the virtual pharmacist and they get back to us…It's saved us time." CP4.

Fewer discrepancies in these medication lists were reported to improve the delivery of Dose Administration Aids (DAA) such as Webster-Paks by preventing delays in their assembly.

"There's less discrepancies with Webster-Pak patients…because whenever there's discrepancies, we have to call the doctor and double check to make sure everything's sorted to confirm." CP5.

Some participants also revealed that medication discharge summaries were sent directly from the virtual clinical pharmacist to the community pharmacy before the patient had left hospital, allowing the pharmacy time to prepare DAA's or order in required medications.

"I find that we get [the discharge medication list] sort of even before they've got back to the [aged care facility] which is really helpful for us because it gives us a little bit of a head start." CP3.

3.4. Involvement in patient care *"We're included in that discharge process, which is really important." CP2*

Participants voiced that they were more involved with patient care following the introduction of the VCPS. Interviewees spoke of feeling as though the virtual clinical pharmacist kept them in the loop and included them in patient management which was appreciated by the community pharmacists.

"What I liked was they actually called us and discussed a patient, what was happening with the patient in the hospital and what's the forward plan, what's the treatment plan, what the patient's expecting as well." CP2.

Multiple pharmacists expressed that VCPS improved continuity of care for patients transitioning back into the community from hospital via the provision of information to community pharmacists. The service had encouraged them to follow-up with patients who had recently been discharged from hospital as they had been kept up to date with their management plan and medication requirements following transition of care back into the community.

"…it certainly encourages us to follow up with patients who've recently been discharged from hospital." CP2.

This communication from the virtual clinical pharmacists also supported the counselling by community pharmacists as they reported they had a better understanding of the patient's situation.

"…it's just good to have that continuity. If we have supplied information just to know if there have been any changes made while they're in hospital." CP6.

Prior to the service introduction there was a poorer understanding of the changes made in hospital, and instances where patients were dispensed medications that had been discontinued during their hospital admission.

"For someone who doesn't have good health literacy, it's just a bit of a minefield. We definitely have had multiple instances where medication changes are made in hospital and then six months later we are requesting new scripts from the GPs and they say, why do you want a script for that? They're not on that medication. We've said, well, they have been for the last six months." CP6.

Some pharmacists reported that they rarely were provided patient medication lists from the virtual clinical pharmacist following sending though a patient medication history from the pharmacy, with patient consent and confidentiality concerns a potential reason for this lack of communication.

"…It would be good, I guess, with those patients who we have sent info through to make sure we are getting a discharge summary, just especially if they've got a Webster-Pak. Not to say we haven't had any at all, but I just yeah can't recall seeing any…" CP6.

4. Discussion

This small qualitative study provides an important insight into perceptions of community pharmacists on a hospital led VCPS. Interviews with seven community pharmacists found that VCPS was an effective means of providing clinical pharmacy services in rural and remote NSW. Community pharmacists experience of the service was overwhelmingly positive, their interactions with clinical pharmacists were welcome and they reported enhancements in workflow and increased involvement in patient care. These findings demonstrate the benefit of VCPS to these communities because of the support provided to the local clinical workforce. These findings strengthen and support research conducted by Allan et al.[11] by integrating a community healthcare perspective into the established positive perceptions of hospital staff.

While some pharmacists had extensive contact with VCPS, others were more limited in their involvement and understanding. The community pharmacists who experienced better initial contact, either in the form of an in-person visit, phone call or email, appeared to have a high level of future involvement with the service. There was no consensus on which form of contact was preferred, but an introduction and early explanation helped community pharmacist engagement with the service. Future practice improvements include VCPS pharmacists identifying when new community pharmacists have been recruited and actively orienting them to the service rather than relying upon relevant information being passed on from previous pharmacists. While most community pharmacists praised the communication from the virtual clinical pharmacists, one raised an issues relating to interactions which did appropriately respect the long-term nature of patient-clinician therapeutic relationships in small rural communities. Any service expansion should include local health professionals such as general practitioners in service implementation and setting clear expectations

for the role of the virtual clinical pharmacist. In small towns with small teams of health professionals it is especially important to establish good involvement and communication early on with community pharmacists to build a collegiate environment and best utilise the VCPS.

The VCPS was recognised as an acceptable service by interviewees to fill the gap in clinical pharmacy services experienced by rural and remote communities. Regional areas continue to experience ongoing workforce shortages of healthcare providers, and in every case, it would not be feasible for small hospitals to employ onsite clinical pharmacists. The virtual model is a solution to this dilemma but will only succeed if it is viewed as acceptable to involved staff and patients, and embraced by all stakeholders. The findings of this study indicate that this virtual pharmacy model of care is indeed valued by the participating community pharmacists. It is critical to recognise that not all small communities are alike, and this research indicated that some community pharmacists have the willingness and capacity to be trained to provide these clinical pharmacy services on top of their community pharmacy duties, which could be pursued by local health services. While virtual health services are critical to circumvent barriers such as distance and workforce shortages, it is no replacement for in-person care.

The workflows of community pharmacists were reported as being generally more efficient due to reduced medication discrepancies and some workload shifted from community to virtual clinical pharmacists. In rural and remote community pharmacy settings this is crucial as it is not unusual to have only one community pharmacist working at a time, and they must balance their duties in a busy and unpredictable retail setting. By streamlining the process of following up and providing accurate discharge information, VCPS has saved time and resources in a time-poor environment. Reduced workload in these areas is critical for supporting rural and remote pharmacists as they are ideally placed to assist some of the most vulnerable in society in accessing healthcare support, and VCPS allows them to dedicate more time to interventions such as patient medication counselling.

Community pharmacists were more involved and included in patient care during transition of care following the introduction of the VCPS. This is imperative for improving patient outcomes as community pharmacists have expert medication knowledge and counselling skills but are often overlooked in integrated care models.

Limitations of the study included participation and response bias. It is possible that those with more favourable experiences of the VCPS were more likely to agree to be interviewed for the study leading to participation bias. During recruitment, two pharmacists expressed frustration with virtual models of care but declined to formally participate in an interview. Response bias may have also been present in the form of courtesy bias, as the interview was conducted using videoconference with a facilitator, which could have impacted the responses from interviewees.

The findings from this study assist in further development of the virtual clinical pharmacy care model and shape the scaling and implementation of the VCPS. Our findings can also inform virtual health services which are being develop to provide specialised health services to rural and remote communities internationally. With the ongoing workforce shortages of clinical pharmacists in regional areas and the importance of these professionals in medication safety, the VCPS has the potential to address this ongoing healthcare workforce shortage dilemma. Relevant research into this domain is critical to ensure the program is effective in improving medication management at transitions of care and is perceived as an acceptable, effective, and efficient system by the involved healthcare professionals. Future studies on the VCPS could include community pharmacist feedback in the form of semi-regular written surveys for providing feedback in a more informal setting compared to interviews.

5. Conclusions

The VCPS is viewed by community pharmacists in rural and remote NSW as an effective service for medication management at transitions of care. The VCPS encouraged positive interactions with community pharmacists and was seen as an acceptable means of providing clinical pharmacy services. The service supported community pharmacists in their practice by creating more efficient workflows and improving involvement in patient care. Ease of communication and accessibility were recognised as key factors in the success of VCPS for community pharmacists. This research has demonstrated the value of VCPS from the perspective of community pharmacists and can be utilised in further refinement and implementation of this service.

Ethics approval and consent to participate

Ethical approval was granted by Greater Western Human Research Ethics Committee (GWHREC) (reference number 2021/ETH01252). Audio recorded verbal consent was obtained from participants prior to participating in interviews.

Consent for publication

All authors consent to the publication of this research.

CRediT authorship contribution statement

Lucy Bucknell: Writing – review & editing, Writing – original draft, Visualization, Investigation, Formal analysis, Data curation. **Brett Chambers:** Visualization, Validation, Supervision, Software, Resources, Project administration, Methodology, Data curation, Conceptualization. **Shannon Nott:** Project administration, Funding acquisition. **Emma Webster:** Writing – review & editing, Visualization, Supervision, Resources, Methodology, Formal analysis, Data curation, Conceptualization.

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.

Availability of data and materials

The datasets created and analysed for this study are not publicly available due to the risk of participants being identifiable from the transcripts due to the small number of participants in the rural and remote region of Western NSW.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.rcsop.2024.100437.

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