

Investigating Inpatient Acceptance of a Unique Telemedicine Service Trialled in the Acute Ward in Rural Australia

Journal of Patient Experience
Volume 12: 1-6
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DOI: 10.1177/23743735241311716
journals.sagepub.com/home/jpx



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Abstract

This study investigated inpatient acceptance of a unique telemedicine clinical service piloted from December 2022 to June 2025 in 3 rural acute wards in Victoria, Australia. The use of virtual care was complementary to the visiting general practitioner (GP) model common in rural hospitals. The qualitative study employed 3 researcher-designed questions: Did you feel safe using the virtual healthcare doctor?; Did you feel the care you experienced was as it should be? And; If you were offered virtual care again, would you use it? Participants ($n = 38$) were predominantly over 65 years (95%). Findings describe safe care as being able to understand the virtual doctor, be listened to, and ask questions. Participants affirmed that the care experienced was helpful due to prompt in-hospital clinical interventions organized by the virtual weekend coverage. Most were first-time users of virtual care and recognized that rural doctors need a break. Barriers to acceptance of the service were concerns about the loss of in-person visits with their local doctor and that virtual care could replace local GPs.

Keywords

virtual acute ward clinical care, rural Australia, inpatient experiences, rural inpatients, telemedicine acceptance

Introduction

Research acknowledges that rural communities benefit from the availability of telemedicine.¹⁻⁴ The concept of telemedicine has been used interchangeably with eHealth and telehealth, and broadly applied to all types of telecommunications technology that provide health information, services, and education at a distance.^{5,6} Recently, and as understood throughout this article, telemedicine refers more specifically to the virtual delivery of clinical services.⁷ This research brief reports on an Australian trial of a unique rural inpatient service where clinical care was provided to hospitalized, acute ward patients virtually. This arrangement and patient experiences have not previously been available or reported upon in the Australian rural inpatient context.¹

based services local GPs are contracted as VMOs under a fee-for-service model.⁸ These arrangements can relieve already over-burdened larger tertiary hospitals, and increase safety, quality, and access to healthcare closer to home for rural populations.^{8,9} However, the sustainability of the GP-VMO model is problematic as found by a small rural health service in northern Victoria, Australia. Driven by a 75% local reduction in GP on-call availability, tracked from 2017 to 2023, and concerns about local GP workforce burnout, the health service investigated and piloted a telemedicine model of care to provide weekend acute ward clinical coverage.

Clinical Care in the Rural In-Patient Setting

In the Australian rural hospital inpatient setting, general practitioner (GP)—visiting medical officers (VMOs), are largely utilized to manage clinical care in the acute ward.⁸ This is due to a lack of fiscal resourcing for rural health services to employ in-situ, salaried hospitalists. To provide hospital-

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A Telemedicine Pilot for Rural Inpatients

The pilot was initiated at the health service from December 2022 to June 2023. The introduction of this unique virtual acute ward model encompassed extensive negotiation with an Australian telemedicine provider, whose physicians are credentialed in accordance with the Safer Care Victoria Medical Credentialing and Scope of Clinical Practice Policy.¹⁰ This is a comparable care standard required in all Australian states and territories to provide in-hospital clinical practice. Telemedicine operated exclusively in the after-hours periods from Friday evening to Monday morning to meet all care needs of inpatients virtually. This involved virtual ward rounds using a mobile iPad screen to visit patients at the bedside, actions included: generating referrals; ordering of tests (eg, x-rays, scans, and blood tests), reviewing and organizing medication changes; accepting transfers from tertiary health services; organizing palliative care transfers to ensure rural patients palliated close to home and family; updating of clinical notes and hand-over to local GPs. This research brief reports on rural inpatient's experiences of the telemedicine service during its trial at the local health service.

Methods

This qualitative study aimed to investigate inpatient acceptance of telemedicine in 3 rural acute wards. Inpatient interviews were conducted from February 2023 to June 2023. The study had ethics approval from the University of Melbourne, Ethics Committee, Office of Research Ethics and Integrity. Reference Number: 2023-25567-36201-4. Participation in the study required consent, was voluntary and no incentives were offered.

Study Setting

The study setting involved 3 sites of a rural health service in northern Victoria, Australia. Site one had 6 acute ward beds, site two had 12 beds, and site three had 16 acute beds (total = 34 beds). The healthcare service area was ~4045 km² with a population of 30 520 people, 28% of whom were over 65 years of age.¹¹

Study Participants

Study participants invited to provide feedback about their telemedicine experience were inpatients who had received virtual clinical care at any of the 3 sites of the health service. As part of the inclusion criteria for the research, they had to be over 18 years old and reside in the local government area. They were invited to provide feedback within 48 hours of receiving the service. Study participant exclusion criteria for those not approached to provide feedback included palliative care patients, complex, or deteriorating patients, those with cognitive impairment or in cognitive

decline, or those unable to give fully informed consent in English. An information sheet about the telemedicine pilot and a plain language statement about the study were displayed in inpatient wards and hard copies were available to all those invited to participate.

Interview Question Design

The literature was examined to identify current tools specific to, inpatient feedback about telemedicine (clinical services) in the acute ward, which could be adapted for the current study. As a result, 3 questions emerged: (1) Did you feel safe using the virtual healthcare doctor? This question was an opportunity to explore confidence and trust in telemedicine and the virtual physician.¹² (2) Did you feel the care you experienced was as it should be? A question devised for feedback about quality and effectiveness.¹³ (3) If you were offered the virtual healthcare option again, would you use it? Versions of this third question are often used to indicate satisfaction or acceptability of the service.¹²

Data Collection

Interviews were undertaken face-to-face in the acute ward and required consent. They ranged from 10 to 20 min. To encourage further discussion when receiving a yes/no answer, the prompt of, can you tell me more about that? was used. Researchers recorded interviews with verbatim handwritten notes. These were then transferred to the Research Electronic Data Capture (REDCap) software, a secure data management system.¹⁴ Each participant was allocated a numerical identifier to maintain anonymity, for example, ID.05. The health service site of care was also recorded along with basic participant characteristics such as the inpatient's gender, and age.

Data Analysis

To commence analysis of textual data the 3 interview questions formed categories in a deductive framework. Categories involve direct accounts and use the explicit content of text as descriptions.¹⁵ Verbatim responses were

Table 1. Study Participant (n = 38) Characteristics.

		n	%
Inpatient location	Site 1	1	3
	Site 2	26	68
	Site 3	11	29
Gender	Male	17	45
	Female	21	55
Age grouped by age classifications	Under 64 years	2	5
	65-74 years	8	21
	75-84 years	10	26
	85 + years	18	47

Table 2. A Summary of Participant Responses About Safety, Care Experience, and Future Use of Virtual Care and Content Analysis of Enablers and Barriers to Rural Inpatient Acceptance of Telemedicine.

Interview Question	Exemplifying Quotes
1. Did you feel safe using the virtual healthcare doctor? Results: n = 38 100% yes/positive but content analysis revealed moderators	Yes, I didn't have much to do, the nurses did most of it. (ID.01) I felt very safe, trusted Doctor [name], and found him easy to understand. (ID.04) Yes, Doctor [name] was great to talk to, and it was great to use new technology. (ID.08) Yes, the doctor did use terms I didn't understand but I was able to ask him to clarify. (ID.09) I had very good care, I felt very safe, and the technology worked very well. (ID.11) It was good, I felt safe, Doctor [name], really listened to me and my needs, he really cared and helped me. (ID.12) Yes, it was wonderful to have Doctor [name], look after me over the weekend. He listened to me. (ID.25) Yes, I felt that Doctor [name], listened to me and I could ask him questions. (ID.31) *Yes, I felt safe, but it is hard for the doctor as they don't know you as well as your normal GP. (ID.34) *Yes, it is a great idea to do it this way. I did forget to ask him a few things, but he did allow time for questions, I just forgot what I wanted to ask. (ID.35) Yes, Doctor [name], was very nice and he explained things so that I could understand. (ID.37) *Yes, I have breathing problems so have trouble asking questions sometimes. (ID.38)
2. Did you feel the care you experienced was as it should be? Results: n = 38 100% yes/positive, but content analysis revealed moderators	Yes, first time using it, but it worked well, and everything was easy to understand. (ID.02) Yes, only the first time I've used it, but the video screen was easy to see and hear, the nurses managed it well. (ID.03) Yes, I got information from him [referring to the virtual clinician] about my medical record that I didn't even know. Doctor [name] was very thorough, and I felt very well cared for. (ID.08) Yes, I was surprised by getting the offer to use it, but it worked very well, Doctor [name] was very helpful (ID.11) Yes, I have used telehealth before with other specialists. No issues with the video or sound quality. The Doctor [name] looked at all aspects of care, he did see photos of my wounds but then asked to see them over the video, which gave him more perspective into what was going on. The Doctor [name] made changes to my medications and ordered a scan for me. (ID.13) Yes, no issues. Doctor [name] was easy to understand, and he started me on antibiotics which has worked and I'm feeling much better. I was amazed at how well it went. (ID.25) It was strange to begin with, but I got used to it and I felt I could ask questions. He made changes to my medications and ordered a scan for me. (ID.31) Yes, Doctor [name], changed my medication and I seen a change straight away, my legs are not as swollen. (ID.33) Yes, Doctor [name] ordered bloods, he was easy to hear and see on screen. (ID.34)
3. If you were offered the virtual healthcare option again, would you use it? Results: n = 38 100% yes/positive, but content analysis revealed moderators	*Yes, but I like my GP and would like to see him, but understand he needs some time off. (ID.02) Yes, very impressed with the service, and impressed that [name of health service] is using new technology and thinking about using new services for patients. (ID.05) Yes, Doctor [name] was great to deal with, he seemed to get on with the nurses. Doctor [name] was very professional and down to earth. (ID.08) *Yes, happy to use it again. It was a good service, a good experience overall. I'm sure the GP's appreciate having a day off. We need to look after them to keep them in the small towns. (ID.13) *I would use it again but it's not as personal as having the doctor in the room. (ID.17) *Yes, that would be fine to give my GP a break. (ID.18) Yes, happy to use the service again. He was a very well-spoken doctor and listened to what was said. (ID.24) Yes, happy to use the service again. Doctor [name] listened to me and my issues. This is a wonderful idea that Doctor [name] is sitting in Melbourne but able to look after me. (ID.25) *Yes, I would be happy to use it again, but I still want to be able to see my doctor. I hope this isn't going to replace them completely. (ID.36)
Content analysis findings from of the interviews	
Enablers or mediators to acceptance	The key enablers to acceptance of the telemedicine service were being able to understand the doctor, ask questions, be listened to, and feeling comfortable, along with, having trust in the doctor and the technology. The main indication of acceptance of the service was patients' willingness to use the telemedicine option again. The frequent use of the virtual clinician's name is suggested as a mediator for successful communication and building a patient/clinician relationship as revealed by the content analysis of the interviews. The positive interpersonal skills of the virtual clinician were also implied in much of the feedback as indicated by references to how the doctor communicated and in their interactions with nurses. The nurse's role in facilitating virtual care was identified as another important feature which supported patients (see examples in bold Q.1 ID.01; Q.2 ID.03. and Q3. ID.08). Interview participants also indicated the clinic interventions arranged were helpful (see Q.2 ID.25; and ID.33).

(continued)

Table 2. (continued)

Interview Question	Exemplifying Quotes
Barriers or moderators to acceptance (indicated by * next to quotes)	A barrier to acceptance of the telemedicine service is indicated by concerns about not having the same relationship as with the usual care provider (see Q.1. *ID.34). Similarly, a barrier to acceptance was the concern that the virtual service would lead to replacement of local doctors (see Q.3 *ID.36). Although, a preference for their own doctor was spoken about but this barrier was moderated by the realisation that local GPs need time off and the care of the rural workforce must be considered (see Q.3 *ID.02; ID.13; ID.17; and ID.18). Barriers to the experience of care when using telemedicine are patients forgetting their questions (Q.1 *ID.35) and the patient's condition reducing their ability to be able to ask questions (see Q.1 *ID. 38). These barriers suggest a potential impact on continuity of care and impact upon care outcomes. These areas are a priority in progressing this pilot of telemedicine. The care experience was indicated as positive by all participants however, a moderator to these results is that most participants indicated this was the first time they had used virtual care. Hence, they have no previous experiences for comparison.

aligned within each category to be presented in a table of results. Duplicate comments were omitted. Inductive content analysis¹⁶ was then completed and reported under 2 themes: enablers to rural inpatient acceptance of telemedicine and, barriers (or moderators) to rural inpatient acceptance of telemedicine.

Findings

In total 38 people who had received the telemedicine service agreed to an interview. Over the pilot timeframe 174 inpatients were provided with virtual clinical care across the 3 health service sites, of these 82 did not meet the study inclusion criteria to be invited to participate in an interview. This equates to 41% of eligible participants being involved in the study. The inability to capture all those eligible for the interview was mainly logistical in the time available to approach inpatients prior to discharge. Individual's privacy to decline the invitation for the interview was respected. Characteristics of study participants who took part in an interview are provided in Table 1. Due to the mainly over 65 years age range participants were grouped according to the commonly accepted age classifications that capture the life stages and needs of older adults; young-old, middle-old, and oldest-old.¹⁷ A summary of findings about safety, care experience, and future use of virtual care and content analysis of enablers and barriers to rural inpatient acceptance of telemedicine is provided in Table 2.

Discussion

This study investigated rural inpatient acceptance of a unique telemedicine arrangement that delivered virtual clinical services to hospitalized patients in the acute ward. The hybrid model was structured to be complementary to the existing GP-VMO coverage for inpatients. At the time of the trial, this type of virtual care had not been available to rural inpatients anywhere in Victoria, Australia. Previous research has

noted that deeper investigation is required into the factors that affect the acceptance of new approaches, such as telemedicine, in rural health service delivery.¹⁸ The findings show that inpatients, who were mainly from an older demographic, felt safe, care was beneficial, and they were willing to use the virtual service again (see Table 2).

Study participants were mainly over 65 years of age, which is congruent with those hospitalized in Australian rural communities where ~21.5% are aged over 65 years compared to 15.4% living in metropolitan areas.¹⁹ Past investigations indicate that eHealth, telecare, and telemedicine have increased acceptability within the younger demographic who have medium to higher education.²⁰ Our study provides important examples of acceptance of telemedicine in the inpatient setting among an older age group. One enabler to acceptance to highlight was the role of the acute ward nurse in facilitating all aspects of the virtual care patient experience (see Table 2). Further investigation is required about the barriers experienced by this group, for example, as indicated in Table 2, innovative options are needed to support inpatients with all their questions during a telemedicine consultation. The problem of GP workforce shortages and the sustainability of VMO arrangements have also been emphasized by this examination of inpatient views. The study participants were concerned about the well-being of their GPs and were aware of the importance of retaining local rural GPs.

Study Limitations

There are critical limitations associated with this study. Patient feedback is vitally important but due to the short timeframe of the pilot we were restricted in the number of interviews undertaken, the diversity of participants (eg, experiences of telemedicine from those below 60 years or non-English speaking), and the amount and type of information collected. The interviews were brief and did not capture detailed information and this limited conducting thematic analysis. However, the interview questions would be useful

to test again, possibly in conjunction with specific rural acute ward quantitative surveys about telemedicine.

In addition, further examination about clinical outcomes associated with the use of telemedicine is required, for example, research questions such as “Did weekend access to a virtual GP-VMO shorten the length of inpatient stay or reduce re-admissions?” or “Due to access to telemedicine over the weekend did commencing antibiotics earlier or changing medications or the ordering of further medical tests (eg, x-rays or blood tests) affect treatment regimens and lead to beneficial effects on inpatients?” These are areas for extended research involving telemedicine and its impact on rural inpatients.

Conclusion

Interest in qualitative perspectives about telemedicine is mounting. Our findings have highlighted the barriers to inpatient acceptance with concerns about the loss of in-person visits and the replacement of the local GP workforce. In conjunction with the enablers identified, the study supports telemedicine’s potential value when complementary to rural GP-VMO arrangements. A study recommendation is that telemedicine in the acute ward would be a useful addition to relieve the GP workforce in other rural health services struggling with local GP-VMO coverage.

Acknowledgments

The authors acknowledge the Traditional owners of the land on which this study was undertaken, the Yorta Yorta Peoples, and pay our respects to all Elders past and present. The project acknowledges the Australian Government Department of Health and Aged Care Rural Health Multidisciplinary Training programme.

Authors’ Contributions

Dr Carol Reid: Study protocol development, ethics application, data collection, analysis and interpretation of findings, first draft of manuscript, subsequent refinement and editing of paper. Catherine Church: Conceptualization of study, data collection, analysis and interpretation of findings, editing and finalization of paper.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: The Rural Health Academic Network research position held by the first author builds research and evaluation capacity within rural health services and is supported by the Rural Health Multidisciplinary Training (RHMT) Program. No funding was received for the preparation of this manuscript.

Ethics Approval

The study had ethics approval from the University of Melbourne, Ethics Committee, Office of Research Ethics and Integrity. Reference Number: 2023-25567-36201-4.

Statement of Human and Animal Rights

Not applicable.

Statement of Informed Consent

Not applicable.

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