The Virtual Care Experience of Patients Diagnosed With COVID-19

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Abstract

Virtual models of care are seen as a sustainable solution to the growing demand for health care. This paper analyses the experience of virtual care among patients diagnosed with COVID-19 in home isolation or health hotel quarantine using a patient-reported experience questionnaire. Results found that patients respond well to virtual models of care during a pandemic. Lessons learned can inform future developments of virtual care models.

Keywords

patient feedback, patient satisfaction, patient expectations, COVID-19, telehealth, technology, access to care

Introduction

Virtual models of care are being widely implemented as sustainable solutions to the growing demand for health care. In addition to the organizational benefits, virtual models have been found to increase patient and carer satisfaction (1). Timely and convenient care, greater access to specialized care, reduced travel requirements, greater involvement from the patients' care network, and increased self-management are some patient benefits of virtual care (2). These benefits should translate to organizational outcomes of reduced avoidable hospital presentations, early discharge, and greater linkages with primary care (1).

While there is research on the patient experience of care in relation to traditional in-person models, studies on the patient experience of virtual care are limited particularly in a pandemic setting (3). Schwamm et al implemented intercoms to allow for virtual interaction with patients on the ward, however due to time constraints, were not able to design a formal study on the patient experience of engaging virtually (4). The study by Khairat et al were the first study to investigate the patient experience of an on-demand virtual clinic for COVID-19-positive patients based in the United States (3). The study found that clinic wait times in particular had a significant impact on patient experience. The current study aims to contribute to the growing body of literature on the virtual care experience by providing insight into the patient experience of a prescribed COVID-19 model of virtual care in an Australian context.

COVID-19 was first detected in Australia on January 25, 2020 (5). At this time, individuals with confirmed COVID-19 quarantined at home or were admitted to hospital. At midnight on March 28, 2020, the New South Wales (NSW) Minister for Health and Medical Research issued 2 public health orders under section 7 of the Public Health Act 2020; Public Health (COVID-19 Air Transportation Quarantine) Order (No 1) 2020 and Public Health (COVID-19 Maritime Quarantine) Order (No 1) 2020 (6,7).

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These orders stated that any person arriving in Australia was subject to a mandatory supervised quarantine period of 14 days.

The Sydney Local Health District (SLHD) mobilized quickly to provide health hotel quarantine to travelers and expatriates returning to NSW as per the Public Health Orders. Hotel sites were located across inner Sydney and were staffed by SLHD clinicians and administrators. Individuals and families eligible for health hotel quarantine were COVID-19 positive or COVID-19 negative with a health issue that required clinical support during quarantine. COVID-19-positive individuals in the community were able to isolate at home; however, if they were unable to, they were transferred to health hotel quarantine.

RPA Virtual Hospital, known as **rpa**virtual, was established by SLHD in February 2020 as an alternative to conventional public health care. On March 11, **rpa**virtual commenced remote monitoring of stable COVID-19-positive patients in home isolation and in health hotel quarantine. It was the first virtual care model for COVID-19-positive patients in NSW and instituted prior to public subsidization of telehealth delivered within 15 kilometers of the patients' home by Australian General Practice.

The **rpa**virtual COVID-19 model of care included twice daily video consults with a registered nurse and remote monitoring of vital signs using a pulse oximeter, to assess oxygen saturation and heart rate, and a temperature patch for continuous temperature monitoring. Patients had 24/7 access to registered nurses through a Virtual Care Centre. The COVID-19 model was continually refined as more became known about COVID-19. COVID-19-positive patients began to be risk-stratified and prescribed a model of care. Only high-risk patients received wearable devices.

Patients received a welcome pack of information about **rpa**virtual, their care, and links to resources. Patients in health hotel quarantine received additional information about the Public Health Orders, quarantine restrictions, and their hotel accommodation (6,7).

This paper aims to describe and understand the experience of virtual care among patients with COVID-19 through a patient-reported experience survey. It was expected that:

1. Patients feel virtual care supports recovery from COVID-19
2. Patients feel confident knowing their symptoms are monitored virtually
3. Patients feel that technology improves their access to care and treatment
4. Patients in home isolation experience virtual care differently to patients in hotel quarantine

Methods

The *rpa*virtual COVID-19 Patient Experience Survey

The study setting was SLHD, located in metropolitan Sydney, NSW, Australia. **rpa**virtual COVID-19-positive patients were surveyed between March 23 and September 30, 2020 using a 20-item Patient-Reported Experience Measure, referred to in this paper as the "questionnaire."

The questionnaire was designed with reference to the Australian Commission on Safety and Quality in Health Care Patient-Reported Experience Measure question set and the NSW Bureau of Health Information outpatient survey (8,9). Some questions were modified by including words like "**rpa**virtual" to create a better understanding for the patient.

The questionnaire addressed the following patient experience domains using closed-ended questions with categorized response options; access and timeliness of care, involvement in decisions about care and treatment, information and communication, care needs, use of videoconferencing and wearable devices, and overall experience.

Questions about language spoken at home, if an interpreter was required and place of isolation were also included.

To enable a more detailed response, 2 free text questions were incorporated at the end of the questionnaire asking patients about what they liked best about the care they received and what part of their care needed improving.

Study Population

All COVID-19-positive patients aged over 18 years with a mobile phone number discharged from **rpa**virtual between March 23 and September 30, 2020 were sent an SMS message inviting them to participate in the patient experience survey. The SMS also contained a link to the questionnaire. A reminder SMS was sent 1 week after the initial message.

The questionnaire was completed on a secure web application, the Research Electronic Data Capture database, or REDcap.

Analysis

All data were de-identified. Percentages were calculated for responses to the closed-ended questions. A χ^2 test with a P value of less than or equal to .05 and a 95% CI was performed on each question to determine whether there was difference in the patient experience based on their isolation location.

Free text responses were analyzed using a grounded approach where responses were grouped into emergent themes using constant comparative analysis until the point of saturation by 3 members of the research team. This process was validated by 5 other members of the research team who undertook the same process independently. Themes and other notable findings were then compared and discussed. Responses that related directly to the health hotels, such as "food" were excluded from the analysis.

Results

Cohort Characteristics

Two hundred and sixty-five (39%) of 665 rpavirtual COVID-19-positive patients completed the questionnaire. The majority (81%) of patients spoke English at home. Of the patients who spoke a language other than English at home (20%), 55% required an interpreter. Forty-nine percent of respondents were in home isolation, 43% were in health

Table 1. Summary of Responses to the Patient Experience Survey for All Patients and for Those in Home Isolation and in Health Hotel Quarantine.

	Total response (%) (n = 265)[a]	Home isolation (%) (n = 129)	Health hotel quarantine (%) (n = 115)
Care received as good or very good	88.7	91.0	85.2
Care and treatment received had helped them definitely or to some extent	92.5	94.7	89.5
Technologies used by **rpavirtual** definitely or to some extent improved their access to care and treatment	86.4	93.2	80.0
Always or mostly felt involved in decisions about their treatment and care	73.1	80.3	64.4
rpavirtual Care Center nurses met their needs always or mostly	93.9	96.2	91.3
Information given to them about **rpavirtual** was definitely or to some extent useful	86.7	93.2	80.0
Care Centre nurses always or sometimes explained things in a way they could understand	97.3	99.2	94.8
The waiting time before the Care Centre nurses answered their call was about right	86.7	94.7	94.8
Always or sometimes felt confident at home knowing that their symptoms were monitored daily	94.3	97.0	91.2
The videoconferencing system was definitely or to some extent easy to use	95.4	95.4	94.8
Received wearable health devices (now issued to patients risk-stratified as high risk)	35.8	55.0	24.7

[a]n = 265 (includes home isolation, health hotel quarantine, and other).
[b]Chi-square performed between those patients in home isolation and those in health hotel quarantine; significant at $P \leq .05$.

hotel quarantine, 3% were in isolation elsewhere, and 5% did not indicate where they were isolating.

Patients Experience of Virtual Care

Overall, COVID-19 patients reported a positive experience with the virtual care they received. The majority of patients rated their overall care as good or very good. Patients also felt confident knowing that their symptoms were being monitored virtually and felt that the technology used by **rpa**virtual improved their access to care and treatment. The majority of patients also reported a positive experience with their care needs being met and the information and communication they received. The least-reported positive experience was patient involvement in care with just over 70% indicating that they felt involved in their care and treatment (Table 1). Of those who reported their overall care as very poor or poor (4.2%), the majority reported that the care from **rpa**virtual was not helpful (72.7%) and that the technology did not improve their access to care (72.7%). All reported that they did not feel involved in their care. Few strengths of virtual care were reported by these patients with discharge-related communication and processes frequently mentioned as weaknesses.

Experience of Virtual Care Associated With Location of Isolation

There was a significant difference in the experience of patients in home isolation compared with those in health hotel quarantine.

Although both groups reported a positive experience of virtual care, patients in home isolation were more likely to report a positive experience of virtual care in all question items compared with patients in health hotel quarantine. Patients in home isolation were more likely to report their care as very good or good than patients in health hotel quarantine. Patients in home isolation were also more likely to feel confident that they were being monitored virtually than patients in health hotel quarantine. Patients in health hotel quarantine were also less likely to report that technology improved their access to care, they felt less involved in decision-making and were less likely to find the information useful (Table 1).

Experience With Wearable Health Devices

Over one-third (36%) of patients received wearable devices for monitoring vital signs (oximeter and temperature patch). Of these, 93% said the devices were easy to use and 95% reported the information about the devices as useful.

Patient Self-Reported Strengths and Weaknesses of Virtual Care

Patients were asked about the best part of the care they received from **rpa**virtual (strengths) and the areas that required improvement (weaknesses). Patients were able to provide a free text response to these questions. Responses were grouped into themes and then divided into subthemes to more accurately reflect feedback.

Table 2. Strengths Identified by Patients.

Theme	Subtheme	Example comment
Model of care	Timely access to care	"Nurses close at hand if needed, pleasant and helpful."
	Regular contact	"Daily check-in to ensure nothing adverse was happening."
	Holistic care	"The nursing staff were amazing. Empathetic, engaged and caring. I was amazed at the emotional support they were prepared to give on top of the medical support."
	Patient and family centered approach	"The best part of the care I received from RPA virtual was Personal Care for me. This helped me a lot within this 14 days. I always felt that someone is looking after me and it helps me to build my confidence and positivity to cope this COVID-19. Patient focused is the main thing I liked about."
Clinician approach	Clinician empathy/attitude	"The nurses! They are wonderful. They always have a smile for me when on call and always happy to answer my questions. They were there when I was anxious. Thank you for looking after me and for caring."
	Clinician knowledge	"Understanding of my Predicament and condition by some of the nurses who had a great deal of empathy."
Patient feelings	Confidence in knowing a clinician was there	"Knowing they were monitoring me so well and that there was always someone I could call."
	Reassurance	"Reassurance that someone was checking on me. Also reassurance that I could ring any time if I felt worried."
Communication	General	"Keeping in touch and keeping me informed so I could feel others were in a similar position as me. Good advice provided to aid general recovery."
	Patient resources	"The ease of access to the hospital and the information provided by rpavirtual."
Technology	Videoconferencing	"The video conference allows a face to face interaction, so much better than a mere phone call. Words combined with facial expressions are so much better."
	Wearable devices	"Good tech, ie temp check and O2 chk etc. and knowledge that you would be checked on regularly."

Strengths. Five themes identified by patients as strengths of the care they received included: the model of care, clinician approach, patient feelings, communication, and technology. Table 2 summarizes these themes and subthemes with supporting quotes.

Weaknesses. Five themes identified by patients as weaknesses of the care they received included: discharge, the model of care, clinician approach, communication, and technology. Table 3 summarizes these themes and subthemes with supporting quotes.

Discussion

Virtual models of care have emerged as alternative, sustainable solutions to the rising demand for health care that can benefit the patient experience (1,2). The COVID-19 pandemic challenged health care organizations, including SLHD, to rapidly respond to a continuously changing environment. Virtual models of care have been particularly critical in this response due to the infectious nature of the virus (10). This study aimed to contribute to existing literature on COVID-19, by providing insight into the patient experience of a virtual model of care during the pandemic.

The current study suggests that patients respond overwhelmingly positively to virtual care in a pandemic context, independent of whether they are isolating at home, in health hotel quarantine, or elsewhere. Key strengths that contribute to the success of virtual care from the patient perspective

include the model of care, the clinician approach, how patients felt as a result of virtual care, communication, and the technology.

This study also indicates that virtual care can support patient recovery from acute COVID-19. The majority of patients self-reported that the technologies used by **rpa**virtual improved their access to care and treatment and that the care received from was helpful to them.

Weaknesses of the current model from a patient perspective include other aspects of the model of care, clinician approach, communication technology, and discharge. Future models of virtual care can learn from these weaknesses to enhance the patient experience.

An important component of the patient experience is confidence in the care they are receiving (11). This is particularly important where care is being delivered virtually and challenges the traditional notion of in-person care (12). This study demonstrates that patients feel confident knowing that their symptoms are being monitored virtually. Patients also felt reassured by a virtual model of care, which was highlighted as a strength of the model. This is particularly telling in the context of a novel virus and new model of care.

Another interesting and relevant feature of the patient experience of virtual care was the ability of the **rpa**virtual clinicians to convey compassion and kindness without any in-person interaction with the patient. This was a particular strength highlighted by patients. Notably, some patients felt there were times when the clinician was less empathetic, attributing this to characteristics of the nurse rather than the

Table 3. Weaknesses Identified by Patients.

Theme	Subtheme	Example comment
Discharge	Communication	"Being discharged. I waited over a week to be discharged and kept getting conflicting information from different nurses."
	Transfer of information	"Communication between nurses doctor and patient, it has been almost one since the doctor verbally discharged, to date has not sent the letter, I asked for the nurse's help and she said she would get back to me and never did!"
	Policies and procedures	"The discharge process. It needs to be improved greatly because people in isolation need to be discharge as soon as they meet the discharge criteria and not be forced to spend more days in isolation due to paperwork."
Model of care	Timely access to care	"I found the calls very repetitive the same questions very day."
	Consistency and repetition of care provision	"The process in which the nurses have to go through to ensure a patient has no symptoms, it was a little vague and not consistent. Didn't bother me however, believe for efficiency in the future could be more structured."
	Consistency of process	"Having the same nurse for the entire period would have been optimal."
	Consistency of nursing staff	"It would be nice to nominate a set time frame for nurses to do video consultation with patient so patient don't have to constantly wait in anticipation of the text to start consultation. Don't know how easy that will be to implement at RPA as I am sure with different rosters and staff availability it cud be difficult."
	Appointment scheduling	"Being sent an SMS and then waiting for the nurse—if the nurse isn't ready, perhaps send a note to propose an alternative time?"
Clinician approach	Clinician empathy/attitude	"Communication from some of the nurses were out of order as they lacked understanding and empathy."
	Clinician knowledge	"It's not to their discredit but just knowing about the virus a little more would have helped but once again not their fault. As a patient we are scared and confused but that said the nurses positivity and warmth every time made up for this."
Communication	Consistency of information	"Information given to the patients. Every callers had a new information over riding the previous information without any change of patients circumstances."
	Follow through on action	"The use of the Temptraq patch. I wasn't able to use it the last few days I was under RPA virtual because I could not monitor the unused patches on the app. I brought attention to this but it was never really addressed/fixed. The issue was always to be followed up."
Technology	Videoconferencing and wearable devices	"The Zoom system. Some staff got it working two way. Others had the video but had to ring my mobile to talk."
	Consistency/reliability	"The technology as the video conferencing didn't always work or the nurses needed further training on how to use it."

virtual component. The findings of this study indicate that the virtual aspect of the model of care does not impact negatively on the relationship between the patient and clinician. However, further research in this area would be beneficial in understanding the true impact on the relationship.

Technology has been a key enabler of virtual care delivery during the pandemic and has a strong impact on a patient's ability to access care (10). This study demonstrated that the technologies used were a strength of the model and improved access to care.

The dynamic nature of information received about COVID-19 required regular updates to the guidelines for clinical management and discharge of COVID-19-positive patients from care and isolation by Australian healthcare providers, including SLHD (13). The impact of these frequent changes had a significant impact on patients but was not reflected in their overall experience of virtual care. Discharge communication and processes were common weaknesses reported by patients who rated their overall care as very good or good and in patients who reported a poor experience.

This study found that while patients had a positive experience overall, there were significant differences between patients in home isolation and health hotel quarantine. Patients in health hotel quarantine were less likely to report a positive experience of virtual care despite receiving the same **rpa**virtual COVID-19 model of care as all patients. This demonstrates the impact of the Public Health Order on the patient experience (6,7).

Limitations

A limitation of the study was the inability to draw conclusions about the experience of virtual care for patients in different population groups. Future research should investigate equity issues in relation to the virtual care model. Virtual care can potentially enhance access to care for some populations, by reducing reliance on access to transport for example. However, there are also potential barriers that are spread inequitably through society such as access to technology, digital health literacy, lack of privacy, beliefs and cultural norms around digital health, and health service competency and cultural safety (14). This is particularly relevant in the context of COVID-19 where existing inequities have been exacerbated (15).

Another limitation of the study was the ability to explore the initial findings in more detail using patient experience interviews to better understand the internal and external factors impacting on the patient experience.

Conclusion

Virtual care has been shown to benefit both the patient and health care organization (1,2). The COVID-19 pandemic has provided a platform for virtual care to thrive; however, little is known about the patient experience of virtual care (9). This study found that patients do respond well to virtual care in the context of a pandemic. Patients feel the technology improves access to care, and they feel confident in knowing their symptoms are monitored virtually. However, the patient experience does differ on isolation location. Further research on the broader experience of patients in health hotel quarantine, including the use of patient experience interviews, during COVID-19 would add to the understanding of the patient experience.

The COVID-19 pandemic has changed the landscape of care forever. Post-pandemic, virtual models of care will continue to complement, or in appropriate settings replace, in-person care (16). This paper has provided insight into the patient experience of virtual care to support health services to navigate the growth of virtual care with a patient and family-focused lens.

Authors' Notes

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Author Biographies

Freya Raffan is the Patient Experience and Service Development manager for RPA Virtual Hospital. She has over 5 years' experience in the public health system, predominately in Community Health Services. Freya holds a Bachelor of Arts – Psychology, a Bachelor of Health and a Masters in Health Service Management.

Teresa Anderson is the chief executive of Sydney Local Health District, one of the leading public health services in Australia. She has more than 35 years of experience as a clinician and health service executive. She is an internationally recognised Speech Pathologist and is passionate about developing programs and services to support and improve the health and wellbeing of all people in the community. In 2018, Teresa was appointed a Member of the Order of Australia (AM).

Tim Sinclair is the executive director of Operations, Sydney Local Health District and was previously the Chief Operating Officer of the Alfred Health Service in Melbourne. He holds a Doctor of Business Administration, a Masters in Health Services Management and is a Director on the ANZAC Health and Medical Research Foundation. Tim has significant experience in the leadership and management of hospital and health services.

Miranda Shaw, as general manager of RPA Virtual Hospital, she established and leads the strategic planning and operations of the first metropolitan virtual hospital in Australia, combining hospital-level care in the community with the latest in digital transformation. Since inception, RPA Virtual Hospital has been at the forefront of the provision of virtual care to COVID-19 positive patients in home isolation and hotel quarantine. Miranda's prior role was General Manager of SLHD Community Health Services, a wide-ranging portfolio of clinical and ancillary services spanning post-natal to end-of-life care.

Sue Amanatidis is currently the research evaluation manager for RPA Virtual Hospital. From 1995 to 2012 Sue held a conjoint appointment with the University of Sydney as Course Coordinator of the Public Health and Community Nutrition and Research course for the Master of Nutrition and Dietetics degrees. From 2012 to 2019, she held the role of director of Specialist Services providing leadership and strategic management to a variety of Specialist services within Community Health Services. Sue holds a Bachelor of Science (Honours) as well as a Diploma of Nutrition and Dietetics and a Masters of Public Health.

Rajip Thapa, with years of working across Information, Communication and Technology and the health care sector, he has used his expertise in data science and analytics as well as his health and IT knowledge to improve health outcomes and models of care for patients. He has a Bachelors in Pharmacy and a Masters in Information Technology (MIT).

Sarah Jane Nilsson has 20 years of clinical experience and a Masters in Health Service Management. she is currently the nurse manager at Sydney Airport, playing a pivotal role in the District's pandemic response.

Dianna Jagers is the director of Clinical Services Support and Integration for RPA Virtual Hospital and is strategically and operationally responsible for the integration of clinical services with information technology to lead the innovate direction of rpavirtual. With over 25 years' experience in health and social care, Dianna is committed to the integration of clinical care with informatics to improve service delivery and enhance patient outcomes. she has a Bachelor of Nursing, Graduate Certificate in Health Informatics and a Master of Health Science.

Andrew Wilson is a co-director of the Menzies Centre for Health Policy and Economics at the University of Sydney and Co-Director of the NHMRC Prevention Partnership Centre. He has specialist professional qualifications in clinical medicine and public health, and a PhD in epidemiology.

Fiona Haigh is the director of the Health Equity Research Development Unit (HERDU) a joint initiative between the University of New South Wales and Sydney Local Health District. Fiona is an applied public health researcher specialising in health equity focussed research with over 20 year's experience working with the health and other sectors to improve considerations of health and health equity in decision-making.