



Research Article

Consumer and Provider Perspectives on Hospital in the Home: A Qualitative Study

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The delivery of acute health care has changed with the adoption of new technologies to meet changing community needs. In response to this, hospital systems and governments have invested in alternative models of care, including hospital in the home (HITH), where acute care that would typically require inpatient treatment is provided in the patient's home. The academic literature presents evidence for comparable or improved patient outcomes associated with HITH interventions. However, it is currently unknown how consumers and providers view the model in the context of a new healthcare facility. This study aimed to elicit consumer and provider views about HITH and how the implementation of a HITH model of care in a new hospital could meet their healthcare needs. We adopted a qualitative approach for this research. Semistructured workshops and interviews were conducted via Zoom, where we presented patient vignettes of different models of care to consumers and providers and recorded their responses using scribes. Qualitative data were independently coded by pairs of researchers to identify themes and subthemes, and demographic data were aggregated. A total of 51 consumers and 35 providers attended the workshops. Consumers and providers frequently described similar themes, particularly accessibility, patient factors, and the health system consequences of HITH. However, the importance and focus of these topics varied across participants. Participants endorsed HITH as a flexible, patient-centred model with potential for wellbeing benefits. However, they noted the potential need for additional resources and increased anxiety among patients with lower health literacy. To address this, participants described the need for clear escalation protocols, communication channels, and expectations around HITH care. In conclusion, HITH is an established model that brings acute care into the homes of patients. The findings of this study support the provision of flexible acute care delivery to meet consumer needs and address the challenges encountered during the COVID-19 pandemic.

1. Introduction

Acute care is in a state of flux, especially with the adoption of new technologies to meet changing community needs, including the increased prevalence of chronic illnesses and the challenges posed by the COVID-19 pandemic [1, 2]. In response, hospital systems and governments have invested in alternative models of care to reduce cost, promote

consumer engagement, and increase the amount and types of care delivered outside of hospital walls [2–4]. One such model is the hospital in the home (HITH), where acute care that would typically require inpatient treatment is provided in the patient's residence [5].

A HITH model of care, typically comprises treatment for conditions that would usually require inpatient care, delivered in a patient's home [6]. In the literature, HITH has

also been termed “hospital at home” [7, 8] or “home-based care” [9–11], and has in common with rehabilitation [9, 11], early discharge [8], and home nurse visits [12–14] clinical care that is delivered at home, thereby reducing or eliminating the length of hospital stay.

The grey literature proposes several benefits of at-home care, including lowered costs [5, 15–20] and shorter lengths of stay in hospital [17], as well as improved patient outcomes including reduced complications [5, 16, 17, 21], mortality [20, 22], and readmissions [15–17]. However, potential barriers in the literature were also identified for the HITH model, including difficulties recruiting staff, particularly in regional or remote areas [23].

HITH interventions have been successfully implemented to manage several acute and chronic conditions, including chronic obstructive pulmonary disease (COPD), chronic kidney disease (CKD), chronic heart failure, and postacute myocardial infarction. For example, reduced readmission rates have been recorded for heart failure patients receiving transitional care interventions [12] and nurse home visits [13] when compared to usual care. Similar positive effects on COPD-specific readmission rates were found for patients receiving early supported discharge [7] and continuity of care interventions [14]. In addition, HITH interventions often produce improved or comparable effects on mortality and clinical indicators when compared to usual inpatient care. Studies have demonstrated significant reductions in mortality for heart failure patients receiving nurse home visits [13] and CKD patients undergoing home haemodialysis [24].

In line with the global shift towards flexible delivery of acute care in response to societal demands and, more recently, the COVID-19 pandemic, HITH interventions have been blended with other models of care, including virtual and integrated care [12, 13, 25]. These include blending home-based care with virtual care interventions, such as telemedicine and telemonitoring. For example, partially telemonitored home-based cardiac rehabilitation programs, or hybrid cardiac rehabilitation, produced comparable improvements in functional capacity and cardiac parameters when compared to outpatient rehabilitation [25]. Similarly, HITH interventions have also been blended with integrated care approaches and telemonitoring. In a review, significant reductions in hospital admissions were found for heart failure patients receiving home visits in conjunction with care coordination when compared to those receiving usual care [26]. However, no significant differences in admissions were found between patients receiving telemonitoring in conjunction with home visits and those receiving usual care [26].

HITH is an established and well-known model of care, and the academic literature presents evidence for comparable or improved care outcomes associated with HITH interventions. However, it is currently unknown how consumers and providers view the model with respect to meeting their needs and expectations in the context of a proposal for a new healthcare facility. Consumer and provider needs and expectations for healthcare delivery have evolved following the rapid changes to healthcare brought about by the COVID-19 pandemic, and it is important to understand where they now lie when designing new systems

for the provision of care. Consumers may prefer an early discharge from the hospital for continuity of care at home, for example, yet providers may not have the capacity to deliver care outside the hospital when resources are already stretched.

To address this gap in the evidence, we undertook a qualitative study of consumers and providers around HITH to inform the potential implementation of the model in a new healthcare facility in New South Wales, Australia. The study was informed by a preceding two-part grey and academic literature review of articles from 2016 to 2021, which identified HITH as an innovative model of care, reporting several benefits and few disadvantages [27]. The current study aimed to elicit consumer and provider perspectives (strengths, barriers, perceived safety, and enablers) about HITH, where health conditions are cared for by hospital staff in the patient’s home, and how implementation of HITH could meet their healthcare needs. The findings will be used by hospital planners in deciding whether to incorporate HITH when developing the care services plan for a new hospital.

1.1. Research Questions

- (1) What are consumer and provider perspectives (strengths, barriers, perceived safety, and enablers) about HITH, where health conditions are cared for by hospital staff in the patient’s home?
- (2) How could the implementation of HITH in a new hospital meet your/their healthcare needs?

2. Methods

Full details of the study methods are provided in the study protocol [28] and are outlined below. This paper reports the methods and results specific to the HITH model of care. The study was informed by a preceding literature review and used a qualitative approach, consisting of a series of focus groups, supplemented by a small number of interviews, with healthcare providers and consumers.

2.1. Study Design. We undertook a two-stage integrative review of the grey and academic literature to identify innovative models of care and the evidence for their implementation in a health system. Stage 1 involved a search of the grey literature to identify innovative models of care, and evidence for these models in the academic literature was found in Stage 2. Following this, a demographic analysis of the patients living in the new hospital catchment was conducted to identify key characteristics of the population that would be receiving care, including prevalent health conditions. These data were combined to guide the design of workshops that elicited consumer and provider views on the innovative models of care, with examples tailored to conditions relevant to participants.

Participants were recruited via a short expression of interest (EOI) questionnaire and allocated to online workshops at a time convenient to them. A workshop scenario

was developed around HITH and tailored to address a prevalent condition or population group within the catchment of the new health facility and presented to participants to enable them to orient themselves to and comprehend the model of care. Workshop scripts and questions were piloted and refined in trial workshops with staff from research and professional backgrounds (see Table 1). Using qualitative research methods and semistructured questions, a series of workshops were conducted, and participants were invited to participate in follow-up, opened-ended interviews to provide additional feedback on the models of care (see Figure 1). Questions slightly differed between consumer and provider, with providers being asked to answer from their own and also from their patient's perspective (see data collection below).

2.2. Study Setting. The study was conducted with consumers who live and providers who work in the catchment of the new health facility. The catchment was defined by the local health district's (LHD) planning team on 16th July 2021, and included 49 suburbs in Sydney, New South Wales, Australia. All consumer and provider workshops and interviews were conducted online via Zoom (Zoom Video Communications Inc.) [29]. *Security guide. Zoom Video Communications Inc. Retrieved from <https://d24cgw3uvb9a9h.cloudfront.net/static/81625/doc/Zoom-Security-White-Paper.pdf>*, in line with local public health orders in response to COVID-19. Optional supplementary interviews were held over the telephone or online via Zoom.

2.3. Sample Size. Overall, we aimed to recruit 15–30 participants for each of the workshops (this estimation takes into consideration participant loss to followup). For the consumer workshops, participants were recruited across four workshops. For the providers, participants were recruited across five workshops. The number of participants in each focus group (~3–4 people) was selected based on our collective research experience and is consistent with the number of participants in focus groups where people feel relatively comfortable speaking among others [30].

2.4. Participants. Consumer participants were included only if they were residents within the catchment of the new health facility and broadly representative in terms of their health condition and the types of patients who may be offered a HITH treatment option. Included providers worked in the catchment of the new hospital and were recruited via LHD email lists; they included healthcare professionals (e.g., medical, nursing, allied health), hospital managers, and support staff (e.g., administration).

2.4.1. Supplementary Interviews. All participants in the workshops were provided an opportunity to participate in a follow-up interview to provide more feedback on the HITH model of care. Additionally, follow-up interviews were offered to hospital administrators and other providers who were unable to attend group workshops.

2.5. Procedure

2.5.1. Recruitment. For all participants, a flyer was disseminated through email lists within the LHD network, as well as local newspapers and via Facebook, which linked to a secure demographic survey hosted on REDCap [31]. Contact information, including the phone number or email address, was gathered for the purposes of arranging participation in a workshop, and each participant was contacted and provided with a series of dates and times.

Separate flyers were translated into the five most prominent non-English languages reported in the LHD (Mandarin, Cantonese, Arabic, Punjabi, Hindi) and distributed to recruit non-English speaking participants in the study. These materials were developed with assistance from bilingual interpreters from the LHD.

2.6. Data Collection

2.6.1. Survey. Participants completed an expression of interest (EOI) via an online survey and were asked a series of demographic questions such as age, gender, and ethnicity.

As this research study forms part of a larger study covering seven models of care, only three models (HITH plus two others) were presented across nine workshops (four consumer and five provider). The additional models to HITH varied across each workshop in order to collect data in respect of all seven models over the parent research project. One of the provider workshops was specifically conducted for general practitioners (GPs), as they were frequently identified as key providers in the HITH model.

2.6.2. Workshop. The online Zoom videoconferencing platform was used for the qualitative data collection. Zoom is a cost-effective and user-friendly tool that has several data management and security features [32]. For example, the host can manage the waiting rooms and exclude a participant who exhibits inappropriate behaviour. This methodology has been shown to be equally valid and legitimate compared with face-to-face methods [33, 34]. Participants were sent the Zoom link for their assigned workshop a few days prior. Each workshop was opened by a research team leader (AC, RCW) with a brief explanation of the purpose of the study, as well as general rules of engagement and opportunities for feedback. To welcome participants and generate discussion, the team leader opened the workshop with a brief icebreaker activity unrelated to the topic of study (i.e., creative uses for a paperclip). Following the general welcome, participants and researchers were allocated to focus groups using Zoom breakout rooms, where the host can randomly assign participants and facilitators to individual "rooms." After a period, participants were notified that they would be returned to the main room. Each focus group contained two researchers (one facilitator and one scribe) and up to five participants. Researchers were associate professors (RCW, PH), postdoctoral researchers (NR, AC, EA), and research assistants (IM, DFP, KN, SH) with experience in qualitative data collection. Within each focus

TABLE 1: Model of care and scenario.

Models	Scenario
Hospital in the home	“Jenny is a 35-year-old, single mother of three who developed a breast infection with an abscess following the birth of her baby. She was treated with intravenous antibiotics (on a drip) and a tube was placed into her breast to drain the infected fluid. After 24 hours, she returned home to her children and is provided wound care and support in her home from a visiting nurse.”

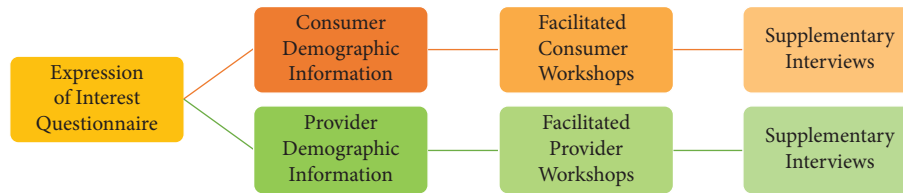


FIGURE 1: Data collection points over time for consumer and provider groups (Figure adapted from [28]).

group, researchers facilitated discussion, asked follow-up questions, and took notes. Audio recordings of the sessions were captured to aid data analysis.

Participants were presented with the model scenario and were asked general questions about the model for themselves and their family members. Providers were additionally asked to consider the model from their own as well as their patients' perspectives. Each workshop ran for two hours including a five-minute break after the first hour. Participation was voluntary, and participants were not provided with compensation for their time or a summary of notes from the workshop. Follow-up interviews were conducted with interested participants after the completion of the workshop.

2.7. Consent. All participants completed a Participant Information and Consent Form (PICF) on REDCap prior to attending a workshop. Additional questions in the PICF assessed the digital literacy of participants, and providers were also asked to indicate the average digital literacy of their patients.

2.8. Analyses. Demographic- and health-related survey data were downloaded from the REDCap EOI and descriptively analysed using SPSS v.22.0 [35]. Qualitative data from workshops and interviews were aggregated across workshops by model and merged into two aggregated narrative summaries, one each for consumers and providers. All participants were deidentified, and any anonymity was protected by changing identifiable features of the experiences or personal details shared in the group (e.g., disease characteristics that could identify a patient).

Handwritten notes were reviewed, and recordings were used to refine the notes and, if clarification was needed the data were aggregated from hand-written notes and analysed separately for consumers and providers. Coding was conducted independently by two members of the research team (AC and NR) using an open coding process in Microsoft Word, and reviewed in pairs, with discrepancies resolved via discussion [36]. The researchers met regularly to share the

results of their initial coding which were then grouped into larger themes through further discussion and synthesised into a series of broad themes, thereby ensuring intercoder reliability. Several themes and subthemes emerged through analyses, and categories of strengths, barriers and limitations, and enablers were established prior to analysis. As per Morse and Field [37], data saturation was reached when no new themes or information emerged. Example themes include patient wellbeing and accessibility. With respect to research question 2, the ways that the implementation of HITH could meet consumer health needs are integrated into the section on the strengths of the model.

3. Results

3.1. Description of Participants. Fifty-one consumers and 35 providers across the health catchment participated in the workshops. Of these, five consumers and one provider participated in a follow-up interview. Demographic data were aggregated to determine the representativeness of the sample. Most of the participants identified as female, aged 31 to 45 years for consumers and 46 to 60 years for providers. Almost all participants reported proficiency in English, and there was evidence for ethnic diversity. See Table 2 for a complete description of consumer and provider demographics.

3.1.1. Consumers. Eighty percent of the sample indicated that they have been affected by an acute condition, and over a third of the sample ($n = 20$; 39%) receive care for one or more chronic conditions. Forty-one percent of the sample ($n = 21$) have received outpatient care for various types of conditions. See Table 3 for breakdown of consumer conditions across types of care.

3.1.2. Providers. Providers occupied a variety of healthcare roles and specialties, including nursing, medical, allied health, and management. See Figure 2 for breakdown of provider role.

TABLE 2: Consumer ($n = 51$) and provider ($n = 35$) demographics.

	Consumers n (%)	Providers n (%)
<i>Gender</i>		
Female	37 (73)	31 (89)
Male	13 (25)	4 (11)
Prefer not to answer	1 (2)	0 (0)
<i>Age</i>		
Under 30	4 (8)	5 (14)
31 to 45	25 (49)	12 (34)
46 to 60	17 (33)	16 (46)
Over 61	5 (10)	2 (6)
<i>Ethnicity</i>		
Australian	36 (58)	25 (54)
Asian	7 (11)	9 (20)
European	6 (10)	4 (9)
Indian	6 (10)	2 (4)
African	2 (3)	1 (2)
New Zealander	2 (3)	1(2)
Middle Eastern	0 (0)	2 (4)
Aboriginal and Torres Strait Islander	0 (0)	1(2)
Other	3 (5)	1(2)
<i>English proficiency</i>		
Excellent	48 (94)	34 (97)
Good	3 (6)	1 (3)
<i>Other language spoken at home</i>		
No	37 (73)	19 (54)
Yes	14 (27)	16 (46)
<i>Language</i>		
Mandarin	3 (20)	4 (21)
Hindi	3 (20)	3 (16)
Tamil	2 (13)	0 (0)
Cantonese	1 (7)	1 (5)
Greek	1 (7)	0 (0)
Arabic	0 (0)	2 (11)
Italian	0 (0)	1 (5)
Other	5 (33)	8 (42)

Note. Participants were able to select >1 ethnicity and language; ethnicity other = Nepalese, Samoan-Australian, Sri Lankan; language other = Croatian, Indonesian, Malayalam, Nepali, Tagalog, Filipino, French, Gujarati, Ilocano, Japanese, and Singhalese.

The health conditions and services that the providers managed related to the lungs ($n = 20$; 57%), heart ($n = 19$; 54%), bone ($n = 16$; 46%), abdomen ($n = 16$; 46%), kidney dialysis ($n = 11$; 31%), and postnatal depression ($n = 11$; 31%). Of the sample, 46% worked within the LHD.

3.2. Qualitative Data. All participants were fluent and elected to participate in English, so no interpreter services were utilised. Qualitative workshop and interview responses about the needs and expectations of the HITH model were aggregated under three broad themes: *strengths and benefits; barriers, challenges, and risks; and enablers and opportunities*. Summaries and examples of themes and subthemes are discussed for providers and consumers, and an overview of the findings has been synthesised into a rich picture in Figure 3.

TABLE 3: Consumer conditions by acuity and whether managed in outpatients.

Conditions	Acute (n)	Chronic (n)	Outpatient (n)
Cardiac	16	4	6
Bone	16	5	8
Abdomen	14	0	0
Lung	9	4	0
Postnatal depression	2	0	0
Renal	0	2	11
Other	30	13	15

Note. Consumers were able to select more than one condition.

3.3. Strengths, Benefits, and Meeting Consumer Healthcare Needs. Consumers and providers identified four main benefits of the HITH model that could meet their needs: *patient experience, better care, accessibility, and health system benefits*. Within each strength, there were several subthemes.

3.3.1. Patient Experience. Receiving care outside of the hospital was associated with wellbeing benefits, including reduced anxiety, social benefits, feelings of security, and maintaining routines. For example, one consumer stated that HITH would provide “*less hospital fear and anxiety about hospital-related trauma*” (Consumer 1 (C1), Interview 1 (I1)). Similarly, consumers described HITH as convenient, particularly for patients with children, or caregivers, which minimises the impact on family life. Consumers also endorsed the strengths of HITH in promoting patient comfort by receiving care in their own environment. For example, patients may receive better food, improved sleep, and mobility. Providers similarly discussed the potential for mental health benefits and increased time patients spend with family.

3.3.2. Better Care. Consumers and providers identified several benefits of HITH that may result in better care for patients and address their healthcare needs. For example, HITH may promote recovery via receiving care in a comfortable environment, as well as reducing the likelihood of hospital-acquired infection, including COVID-19; HITH may also reduce “*site infection for IV therapy*” (P4, W7). Providers discussed the potential patient benefits of HITH by capturing those who self-discharge and promote individualised, patient-centred care.

Consumers also raised potential benefits for staff by allowing them to consult with the patient in their own environment. Similarly, consumers endorsed the continuity of care that HITH may provide. For example, receiving patient-centred, one-on-one care, particularly if the patient is visited by the same nurse: “*Personal experience—community nurse who is dedicated to your care, rather than sharing a nurse with multiple patients in an acute setting or rotating staff—less things are missed due to continuity of care*” (Consumer 3 (C3), Workshop 7 (W7)).

3.3.3. Accessibility. Consumers and providers supported the accessibility and flexibility of the HITH model in meeting their healthcare needs, particularly by identifying issues

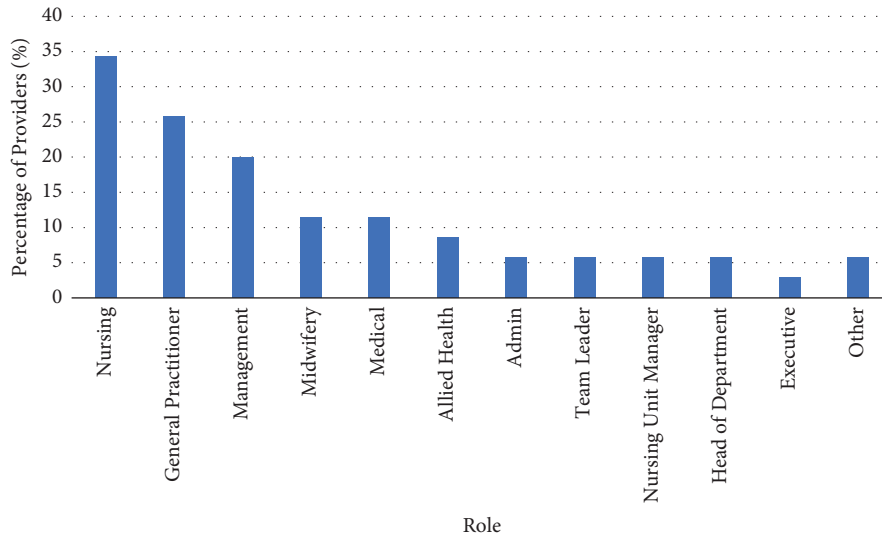


FIGURE 2: Provider role.

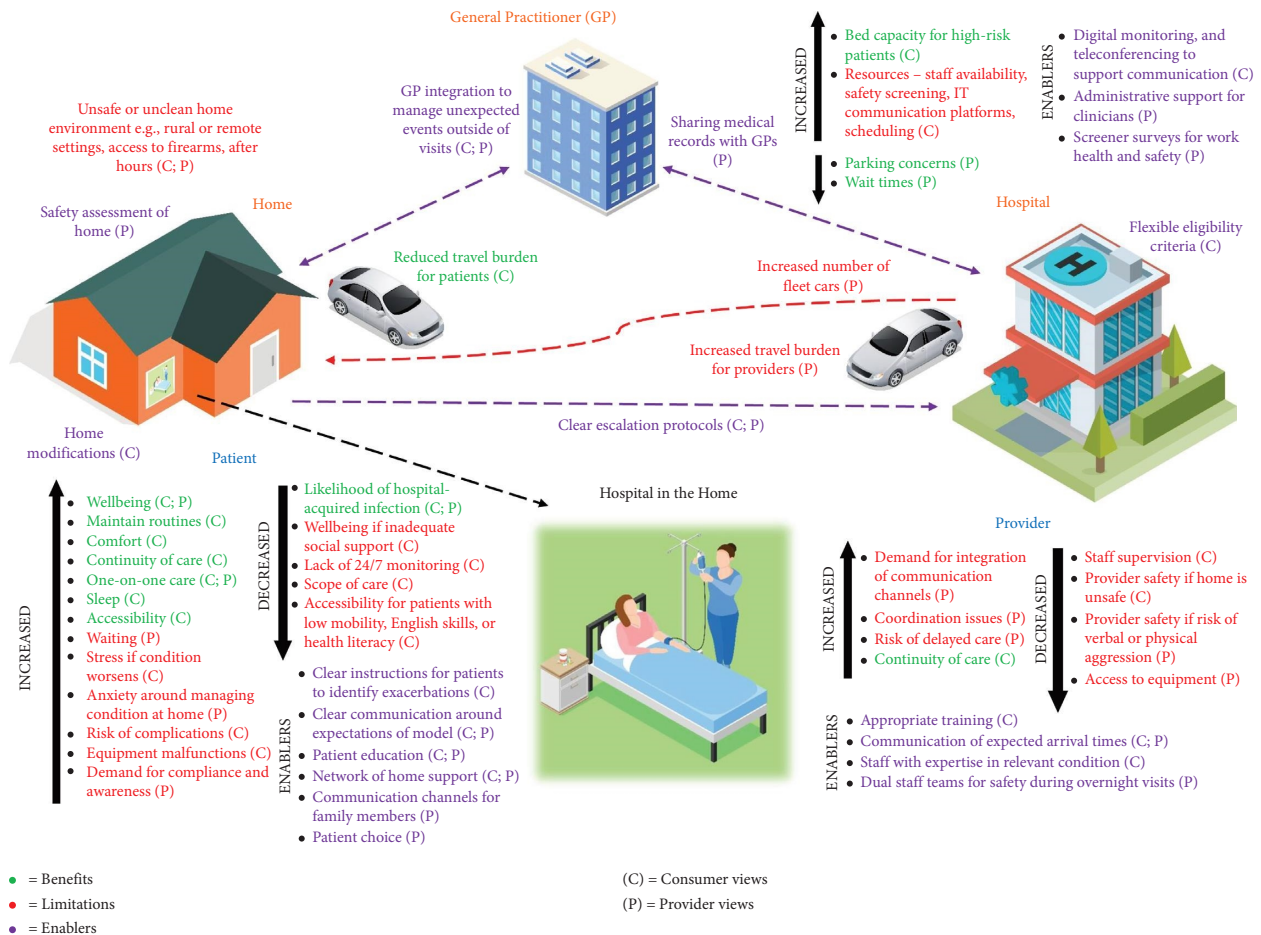


FIGURE 3: Rich graphic of a hospital in the home.

early through routine visits. Similarly, at-home visits remove the travel burden, in-person wait times, and parking concerns for patients.

3.3.4. *Health System Benefits.* Consumers described HITH as a resourceful model that would provide benefits for the health system, for example, increasing parking and

improving “*hospital capacity for higher-risk patients*” (C2, W3). Similarly, providers mentioned that HITH may reduce wait times for treatment.

3.4. Barriers, Challenges, and Risks. Consumers and providers identified several barriers, challenges, and risks for the HITH model. These were related to *patient factors, health system factors, worse care, and accessibility*, and several subthemes were identified.

3.4.1. Patient Factors. Consumers and providers discussed several patient factors that may present as challenges or barriers to the HITH model. Both felt that patients may experience reduced wellbeing if they have additional family responsibilities and do not have adequate social support, and that patients may experience anxiety waiting for clinicians to attend. Similarly, patients may find HITH challenging or stressful if their condition worsens, they are not able to receive adequate rest, or they are uncomfortable with a stranger in their home. For example, “*some patients do not want to go home*” (C2, W7). Providers similarly discussed how some patients may not be candidates for HITH if they are not educated about the model or are noncompliant with medical directives.

3.4.2. Health System Factors. Consumers and providers described several health system factors that may present barriers or challenges for the HITH model. Specifically, it may require additional resources, expert staff, fleet cars, equipment, and increased staff availability to maintain the model. Providers discussed how staff may be unwilling to enter patients' homes and may be at risk of verbal and physical aggression, for example, in rural settings with firearms or after-hours home visits. Similarly, it may necessitate additional processes, such as timetabling and safety screenings, and integration with multidisciplinary teams. For example, “*how do you transition patients from HITH to the hospital if they have an exacerbation? Some patients may be very resistant*” (C3, W7).

3.4.3. Worse Care. Consumers and providers identified potential consequences or barriers of HITH that may lead to worse care. For instance, there may be staff issues related to the HITH model, including a lack of staff supervision, coordination issues, inappropriate treatment, a lack of 24/7 monitoring, potential for adverse events, and reduced continuity of care if different providers attend to patients. Providers described how delayed care and a lack of communication between providers may result in the patient falling through the cracks. Similarly, the scope of HITH care may be limited, particularly in the event of escalating care needs, an emergency, or if the patient has other needs not able to be addressed by a single provider. Consumers also discussed the potential for equipment malfunctions (e.g., haemodialysis machine), and that HITH may be less suitable for patients with complex conditions, or who need time-demanding care.

3.4.4. Accessibility. Consumers and providers discussed accessibility concerns for the HITH model related to communication and environmental issues. For instance, consumers were concerned about the accessibility of HITH for patients with poor English skills, low mobility, disability, or low health literacy: “*people who are not able to advocate for themselves for their condition—things might be picked up in the hospital that would be missed when care is delivered at home. Things might get missed*” (C1, I1). Similarly, patients may experience difficulties if the home environment is not conducive to care or recovery, for example, if the home is unclean, unsafe, or if the patient has drug use habits.

Providers discussed how provider travel may be difficult if the patient lives far away and that the HITH model may be more patient-dependent than inpatient care, requiring greater patient compliance with prescribed treatment and awareness of their own condition. Poor communication between patients and providers and integration issues between information-sharing platforms were also identified as potential barriers to care.

3.5. Enablers and Opportunities. Consumers and providers identified several enablers and opportunities to support HITH. These were *systems/processes, communication, skills/awareness, people, and resources*, and several subthemes were identified.

3.5.1. Systems and Processes. Consumers discussed the importance of clear escalation protocols in case of needing more advanced care, appropriate training in the model, and flexible eligibility criteria. There was an emphasis on safety, particularly in identifying at-risk patients and creating clear instructions for patients on how to identify and navigate exacerbations. Some consumers endorsed the inclusion of digital monitoring, teleconferencing, and patient-reported outcome measures to support these aims.

Providers also discussed the importance of care processes to support the accessibility of HITH care. For example, they identified that adequate integration of electronic communication systems between HITH and hospital support, implementation of systems to communicate appointment times and logistics, and determination of clear clinical triggers for when to readmit a patient were all vital to make HITH more accessible. Similarly, providers described the need for administration support for clinicians, adequate referral systems, and access to equipment. In addition, the establishment of links to GP networks, hospital departments, and community services were identified. Some providers endorsed the safety and wellbeing protocols including screener surveys for work health and safety and an assessment of the safety of the home environment. Critically, providers emphasised the importance of patient choice when assigning patients to the HITH model.

3.5.2. Communication. Consumers and providers discussed the importance of communication in supporting the HITH model, specifically, clear communication around patient

expectations of the model, education and training of the patient, and clear instructions provided at hospital discharge. Consumers and providers also identified the importance of coordination and communication, including anticipated arrival times, consultation and communication pathways between patients and hospital providers between visits, streamlined sharing of medical records with GPs and team members, and adequate communication channels for family members. Similarly, consumers supported the integration of community services and GPs in case unexpected events occurred outside of regular visits.

3.5.3. Skills and Awareness. Consumers identified patient and provider skills as necessary enablers for HITH. These include having qualified staff with expertise in the relevant condition, as well as patient education, including picture books or other educational materials to support children receiving care.

3.5.4. Healthcare Staff. Consumers discussed the importance of clinical and home support people to enable the HITH model. Specifically identified were trained and well-scheduled staff, and a network at home to cope, for example, “*the logistics of managing patients in rural and remote areas for services. If the nurse does not stay with the patient for the care-labour intensive*” (C1, I1).

3.5.5. Resources. Consumers and providers identified relevant resource considerations, including infrastructure, home modifications, and supplies to enable HITH, for example, specialised nurses, trustworthy staff, home support and carers, as well as electricity and plumbing work to enable treatment (e.g., home haemodialysis). Similarly, HITH may require additional medical support, maintenance pathways, and fleet cars for staff. Safety concerns were also raised, including ensuring dual staff teams to protect staff during overnight visits.

3.6. Usability. Consumers and providers were asked to rate the usability of the HITH model for themselves and their family members. Most consumers rated HITH as highly useable; however, some consumers had concerns about access, language, and parking. Providers gave mixed feedback, stating that the usability of the model would be largely dependent on the health literacy of the patient and would likely be most suited for early discharge patients who have additional support at home.

3.7. Blended HITH Models. Consumers and providers frequently endorsed a blending of HITH with other models of care. This included blending HITH with integrated, virtual, or specialist hospital care.

3.7.1. HITH with Integrated Care. Blending-integrated care and HITH was supported by consumers and providers as bringing multidisciplinary care into the home environment. For example, providing at-home wound care for patients with complex conditions with oversight from

a multidisciplinary team. An integrated-HITH approach was endorsed by consumers and providers to prevent unnecessary admissions, particularly when coordinated by a GP.

3.7.2. HITH with Virtual Care. A blended HITH-virtual model was similarly endorsed by consumers and providers to increase access to immediate care at home. Specifically, videoconferencing and remote monitoring may alleviate travel and distance concerns for patients seeking additional care outside of routine visits. Similarly, as consumers and providers raised concerns about patient health literacy when navigating HITH, teleconferencing and digital apps may be useful adjuncts to patient descriptions of their condition, for example, utilising a virtual photo sharing platform to share wound updates with nurses.

3.7.3. HITH with Specialist Hospitals. Consumers and providers supported the blending of HITH with specialist care, for example, providing patients with at-home access to specialist nurses and doctors with expertise in their condition. Consumers and providers proposed that blended HITH-specialist care would reduce bed block, improve patient comfort, and assist recovery. Additional benefits concerned the accessibility of a blended specialist model by removing the burden of travel when seeking specialist care for less mobile or acutely unwell patients.

4. Discussion

This study examined the potential strengths and limitations of HITH from the perspective of consumers and providers who live or work in the catchment of a proposed new hospital. Participants were drawn from a diverse demographic sample where variation in health concerns, age, professional background, ethnicity, and digital literacy were observed.

Within workshops and interviews, consumers and providers frequently discussed similar themes, such as accessibility, patient factors (e.g., levels of health literacy), and health system consequences; however, the importance and focus of these topics differed. Both consumers and providers stated that receiving care at home may reduce patient anxiety and promote comfort, improve hospital capacity, and reduce the potential for hospital-acquired infection. In addition, consumers also discussed the potential for HITH to alleviate patient travel burdens. These findings have support in the literature, where patients receiving chemotherapy at home reported lower levels of treatment-associated anxiety, and reduced travel burdens, when compared to in-hospital treatment [38]. Similarly, a trial of HITH for psychiatric patients presenting to the Emergency Department was generally well-supported by patients and family members, reducing length of stay and increasing inpatient bed capacity [39]. However, while 92% of patients who had experienced HITH indicated that they would use the service again, 88% of caregivers and family members surveyed reported that HITH disrupted at-home routines [39].

When discussing concerns or barriers to the HITH model, consumers and providers identified the potential for increased patient anxiety, and the need for additional staffing and resources. The model was deemed less suitable for patients with poor health literacy, unsafe home environments, and those with escalating care needs. These views have support in the literature, where HITH has been considered unworkable for patients requiring an interpreter [38], those without a safe home environment [39], and those who are medically unstable [39]. Similarly, with respect to additional staff burdens, a study examining the potential consequences of HITH on nurses found that travel between patients created additional time pressures and emotional stress for nurses often resulting in riskier driving behaviours [40]. While both consumers and providers discussed the potential impacts of the model on the health system, providers did not share consumer concerns around a potential lack of supervision, adverse events, or reduced continuity of care. However, there is some support for the increased incidence of adverse events in HITH care as a result of inexperienced staff overestimating the capability of their patients to manage at home [41].

To address these challenges, consumers and providers offered several enablers for the HITH model. Significant overlap in views was observed, including the need for escalation protocols when a patient's health deteriorates, direct patient-to-provider communication channels, GP and community service involvement, and trained staff. Similarly, both consumers and providers identified the importance of a home support network, as well as the education and training of the patients, and the establishment of clear patient expectations around HITH. Providers also emphasised the importance of screening and patient choice in determining the suitability of the model. These protocols and procedures have support in the literature. For example, a HITH trial for psychiatric patients ensured that patients were screened for suitability for at-home care, including criteria related to medical stability, home environment, and caregiver support [39]. Additional criteria for patient screening include an assessment of substance misuse, the presence of aggressive relatives or pets in the home, language barriers, and access to a telephone or other means of rapid communication [41].

Consumers and providers identified several potential strengths of the HITH model for care outcomes that have support in the academic literature. For instance, participants often noted the potential for HITH to provide better care for patients, leading to improved health outcomes. However, the evidence for reductions in mortality is mixed in the literature. For example, nurse home visits significantly reduced mortality rates among heart failure patients [13]; however, no significant difference in mortality rates was found for COPD patients receiving HITH care [7, 14]. Similarly, home haemodialysis was associated with significant reductions in mortality among CKD patients [24].

It is unclear whether variation in outcomes may reflect condition-specific complications, or if HITH more frequently provides a comparable quality of care to inpatient treatment, with the potential for additional benefits associated with out-of-hospital care. For example, home-based

cardiac rehabilitation produced similar effects on rates of reinfarction requiring rehospitalisation, when compared to centre-based care [9, 11]; however, there was some evidence for greater adherence to the program when delivered at home [9]. This may be attributable to the convenience factor raised by participants in the present study, where HITH care fits the schedule of the patients and minimises travel burdens, particularly for less mobile patients.

While our consumers and providers raised the potential wellbeing benefits of HITH for patients, mixed evidence for the effects of the model on health-related quality of life outcomes was found in the literature. Specifically, quality of life outcomes among patients receiving home-based exercise training for COPD [10, 14] and cardiac rehabilitation for heart disease [9, 25] did not significantly differ from patients receiving centre-based care. However, it is unclear whether patients may have experienced additional wellbeing outcomes, such as peace of mind, reduction in anxiety, and comfort, not captured by health-related quality of life measures.

Consumers and providers proposed blending HITH with other models of care to maximise the benefits of at-home care. For example, participants perceived that some patients with complex chronic conditions may benefit from a blended integrated-HITH or HITH-specialist model to access multidisciplinary or specialised care at home. Similarly, virtual-HITH was perceived to overcome language, communication, and health literacy barriers by allowing the sharing of multimedia updates with providers in real time. To support the blending of HITH and virtual care that was preferred by participants, one review [24] found evidence of further improved home haemodialysis outcomes when telemedicine was incorporated into care. This blending appeared to halve hospitalisation rates, when compared to home haemodialysis patients not receiving telemedicine [24]. Future work could expand on these findings by examining whether blended vignettes maximise the strengths of HITH and overcome some of the barriers and challenges associated with the model.

4.1. Limitations. While this study had noted strengths in sampling participants from the catchment of the new hospital, the impact of local COVID-19 health directives necessitated a shift to online workshops over Zoom, which may have unwittingly excluded participants who were unfamiliar or uncomfortable with online videoconferencing platforms. To address this, workshop facilitators asked participants to discuss the model from their own perspective, as well as that of relatives and other members of their community. However, future work would likely benefit from in-person workshops to limit the impact of digital literacy on participation. Similarly, as the sampling was geographically limited, these findings may not generalise to other regions or local health districts.

As the aim of this study was to examine the perspectives of consumers and providers in the catchment of the new hospital, we did not exclusively recruit participants with experience with specific models of care. As a result, we did not necessarily capture participants with prior experience of HITH, and therefore, the discussion was largely hypothetical

and centred around the vignettes and needs of consumers and providers. Future work may greatly benefit from a focused examination of HITH from the perspectives of consumers and providers with direct experience of the model.

5. Conclusion

In conclusion, HITH is an established model of care that brings acute care into the homes of patients [5]. Within workshops, consumers and providers endorsed HITH as a model that may provide several patient and health system benefits, including improved wellbeing, convenience, and reduced in-hospital bed block. However, some participants raised concerns about the practicality of the model, including safety, scheduling, and health literacy concerns. To remedy this, consumers and providers endorsed a blending of elements of HITH with other models to maximise the benefits and limit the barriers to receiving 24-hour care at home. The findings of this study support the provision of flexible acute care to meet consumer needs, particularly during the COVID-19 pandemic, and provide avenues for further study into patient and provider expectations around innovative models of care.

Data Availability

The workshop data used to support the findings of this study have not been made available due to limitations in the scope of ethics approval.

Additional Points

What is known about the topic? (i) Hospital in the home has been effectively implemented to treat and manage a number of acute and chronic conditions. (ii) There are known strengths and limitations of the model, particularly for the health system. *What this paper adds.* (i) Consumers and providers shared similar views on the potential strengths and benefits of hospital in the home. (ii) Consumers and providers endorsed hybrid delivery of hospital in the home care. (iii) The impact of at-home care on wellbeing is discussed, as well as the implications for flexible delivery during pandemic outbreaks.

Ethical Approval

Ethics approval for conducting the study was obtained from the Local Health District Human Research Ethics Committee (2021/PID01000).

Disclosure

The funder did not play a part in the design, conduct, or reporting of this study.

Conflicts of Interest

Katherine Maka and Graeme Loy are employees of the Local Health District where the new hospital will be built. The remaining authors have no conflicts of interest to declare.

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References

- [1] R. Amalberti, W. Nicklin, and J. Braithwaite, "Preparing national health systems to cope with the impending tsunami of ageing and its associated complexities: towards more sustainable health care," *International Journal for Quality in Health Care*, vol. 28, no. 3, pp. 412–414, 2016.
- [2] Department of Health, "Systemic national challenges in health care," 2013, <https://www1.health.gov.au/internet/publications/publishing.nsf/Content/NPHC-Strategic-Framework%7Esystemic>.
- [3] J. Conley, C. W. O'Brien, B. A. Leff, S. Bolen, and D. Zulman, "Alternative strategies to inpatient hospitalization for acute medical conditions: a systematic review," *JAMA Internal Medicine*, vol. 176, no. 11, pp. 1693–1702, 2016.
- [4] The Australian Digital Health Agency, "Framework for Action: how Australia will deliver the benefits of digitally enabled health and care," 2020, https://conversation.digitalhealth.gov.au/sites/default/files/framework_for_action_-_july_2018.pdf.
- [5] Queensland Health, "Hospital in the home (HITH) guidelines," 2012, https://www.hithsociety.org.au/Resources/Documents/QLD_HITH_Guidelines_20131129.pdf.
- [6] G. Caplan, "Does 'Hospital in the Home' treatment prevent delirium?" *Aging Health*, vol. 4, no. 1, pp. 69–74, 2008.
- [7] C. Echevarria, K. Brewin, H. Horobin et al., "Early supported discharge/hospital at home for acute exacerbation of chronic obstructive pulmonary disease: a review and meta-analysis," *COPD: Journal of Chronic Obstructive Pulmonary Disease*, vol. 13, no. 4, pp. 523–533, 2016.
- [8] D. C. Goncalves-Bradley, S. Iliffe, H. A. Doll et al., "Early discharge hospital at home," *Cochrane Database of Systematic Reviews*, vol. 6, no. 6, Article ID CD000356, 2017.
- [9] L. Anderson, G. A. Sharp, R. J. Norton et al., "Home-based versus centre-based cardiac rehabilitation," *Cochrane Database of Systematic Reviews*, vol. 6, no. 6, Article ID CD007130, 2017.
- [10] F. Wuytack, D. Devane, E. Stovold et al., "Comparison of outpatient and home-based exercise training programmes for COPD: a systematic review and meta-analysis," *Respirology*, vol. 23, no. 3, pp. 272–283, 2018.
- [11] T. L. Xia, F. Y. Huang, Y. Peng et al., "Efficacy of different types of exercise-based cardiac rehabilitation on coronary heart disease: a network meta-analysis," *Journal of General Internal Medicine*, vol. 33, no. 12, pp. 2201–2209, 2018.
- [12] Y. Li, M. R. Fu, B. Luo, M. Li, H. Zheng, and J. Fang, "The effectiveness of transitional care interventions on health care utilization in patients discharged from the hospital with heart failure: a systematic review and meta-analysis," *Journal of the American Medical Directors Association*, vol. 22, no. 3, pp. 621–629, 2021.
- [13] H. G. C. Van Spall, T. Rahman, O. Mytton et al., "Comparative effectiveness of transitional care services in patients discharged from the hospital with heart failure: a systematic review and network meta-analysis," *European Journal of Heart Failure*, vol. 19, no. 11, pp. 1427–1443, 2017.

- [14] F. Yang, Z. F. Xiong, C. Yang et al., "Continuity of care to prevent readmissions for patients with chronic obstructive pulmonary disease: a systematic review and meta-analysis," *COPD: Journal of Chronic Obstructive Pulmonary Disease*, vol. 14, no. 2, pp. 251–261, 2017.
- [15] M. Hostetter and S. Klein, "Has the time finally Come for Hospital at home? The commonwealth fund," 2020, <https://www.commonwealthfund.org/publications/newsletter-article/2020/jul/has-time-finally-come-hospital-home>.
- [16] B. Konstantinova, "Hospital in the home: an innovative partnership model," 2016, <https://aci.health.nsw.gov.au/ie/projects/hospital-in-the-home>.
- [17] J. Lazare, "Hospital at home: patient care model of the future?" *Aging Well*, vol. 6, no. 2, p. 20, 2013.
- [18] D. McCarthy, J. Ryan, and S. Klein, "Models of care for high-need, high-cost patients: an evidence synthesis," 2015, <https://www.commonwealthfund.org/publications/issue-briefs/2015/oct/models-care-high-need-high-cost-patients-evidence-synthesis>.
- [19] H. Pingali, D. Kothari, and R. Phillips, "Why we should expand hospital-at-home during the COVID-19 pandemic," 2020, <https://www.weforum.org/agenda/2020/04/hospital-at-home-covid19-coronavirus-pandemic-nursing-care/>.
- [20] S. Weiner, "Interest in hospital-at-home programs explodes during COVID-19," 2020, <https://www.aamc.org/news-insights/interest-hospital-home-programs-explodes-during-covid-19>.
- [21] M. Hensher, B. Rasmussen, and M. Duke, "The 'hospital in the home' revolution has been stalled by COVID-19. But it's still a good idea," 2020, <https://theconversation.com/the-hospital-in-the-home-revolution-has-been-stalled-by-covid-19-but-its-still-a-good-idea-130058>.
- [22] A. Siu and L. V. DeCherrie, "Inside Mount Sinai's hospital-at-home program," 2019, <https://hbr.org/2019/05/inside-mount-sinai-hospital-at-home-program?registration=success>.
- [23] The Kings Fund, "Home care in England Views from commissioners and providers," 2018, <https://www.kingsfund.org.uk/sites/default/files/2018-12/Home-care-in-England-summary.pdf>.
- [24] P. Ramar, A. T. Ahmed, Z. Wang et al., "Effects of different models of dialysis care on patient-important outcomes: a systematic review and meta-analysis," *Population Health Management*, vol. 20, no. 6, pp. 495–505, 2017.
- [25] C. Wu, Y. Li, and J. Chen, "Hybrid versus traditional cardiac rehabilitation models: a systematic review and meta-analysis," *Kardiologia Polska*, vol. 76, no. 12, pp. 1717–1724, 2018.
- [26] K. M. Ledwin and R. Lorenz, "The impact of nurse-led community-based models of care on hospital admission rates in heart failure patients: an integrative review," *Heart and Lung*, vol. 50, no. 5, pp. 685–692, 2021.
- [27] N. Roberts, A. Carrigan, R. Clay-Williams et al., "Innovative models of healthcare delivery: an umbrella review of reviews," *BMJ Open*, vol. 13, no. 2, Article ID e066270, 2023.
- [28] A. Carrigan, N. Roberts, R. Clay-Williams et al., "Innovative models of care for the health facility of the future: a protocol for a mixed-methods study to elicit consumer and provider views," *BMJ Open*, vol. 12, no. 11, Article ID e059330, 2022.
- [29] Zoom Video Communications Inc, "Security guide," 2016, <https://d24cgw3uvb9a9h.cloudfront.net/static/81625/doc/Zoom-Security-White-Paper.pdf>.
- [30] M. Bloor, *Focus Groups in Social Research*, Sage, Thousand Oaks, CA, USA, 2001.
- [31] P. A. Harris, R. Taylor, R. Thielke, J. Payne, N. Gonzalez, and J. G. Conde, "Research electronic data capture (REDCap)--a metadata-driven methodology and workflow process for providing translational research informatics support," *Journal of Biomedical Informatics*, vol. 42, no. 2, pp. 377–381, 2009.
- [32] M. M. Archibald, R. C. Ambagtsheer, M. G. Casey, and M. Lawless, "Using zoom videoconferencing for qualitative data collection: perceptions and experiences of researchers and participants," *International Journal of Qualitative Methods*, vol. 18, Article ID 160940691987459, 2019.
- [33] V. Braun, V. Clarke, and D. Gray, "Innovations in qualitative methods," *The Palgrave handbook of critical social psychology*, pp. 243–266, 2017.
- [34] M. Howlett, "Looking at the 'field' through a Zoom lens: methodological reflections on conducting online research during a global pandemic," *Qualitative Research*, vol. 22, no. 3, pp. 387–402, 2022.
- [35] International Business Machines, *International Business Machines SPSS Statistics for Windows*, International Business Machines SPSS, Armonk, NY, USA, 2013.
- [36] V. Braun and V. Clarke, "Using thematic analysis in psychology," *Qualitative Research in Psychology*, vol. 3, no. 2, pp. 77–101, 2006.
- [37] J. M. Morse and P.-A. Field, "Nursing research: the application of qualitative approaches," *Nelson Thornes*, 1995.
- [38] D. Rischin, M. A. White, J. P. Matthews et al., "A randomised crossover trial of chemotherapy in the home: patient preferences and cost analysis," *Medical Journal Australia*, vol. 173, no. 3, pp. 125–127, 2000.
- [39] R. Kalucy, L. Thomas, B. Lia, T. Slattery, and D. Norris, "Managing increased demand for mental health services in a public hospital emergency department: a trial of 'Hospital in the Home' for mental health consumers," *International Journal of Mental Health Nursing*, vol. 13, no. 4, pp. 275–281, 2004.
- [40] S. Cœugnet, J. Forrierre, J. Naveteur, C. Dubreucq, and F. Anceaux, "Time pressure and regulations on hospital-in-the-home (HITH) nurses: an on-the-road study," *Applied Ergonomics*, vol. 54, pp. 110–119, 2016.
- [41] B. P. Howden and M. L. Grayson, "5: hospital-in-the-home treatment of infectious diseases," *Medical Journal of Australia*, vol. 176, no. 7, pp. 440–445, 2002.