



**Partnerships in Aged Care Emergency  
Services Using Interactive Telehealth (PACE-IT)**

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A thesis submitted for the award of the

**Doctor of Philosophy (Nursing)**

School of Nursing and Midwifery

The University of Newcastle

July 2023

This research was supported by an Australian Government Research Training Program (RTP) Scholarship and funded by a grant awarded under the Translational Research Grants Scheme in 2019 by the Ministry of Health, New South Wales, Australia.

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Sunner, C., Giles, M. T., Kable, A. & Foureur, M. (2022). Does telehealth influence the decision to transfer residents of residential aged care facilities to emergency departments? A scoping review. *International Journal of Older People Nursing*, 18(1), e12517. <https://doi.org/10.1111/opn.12517>

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Sunner, C., Giles, M.T., Parker, V., Dilworth, S., Bantawa, K., Kable, A., Oldmeadow, C. &

Foureur, M. (2020). PACE-IT study protocol: A stepped wedge cluster randomised controlled trial evaluating the implementation of telehealth visual assessment in emergency care for people living in residential aged care facilities. *BMC Health Services Research*, 20, 672. <https://doi.org/10.1186/s12913-020-05539-1>

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## COVID-19 manager interviews study

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Sunner, C., Giles, M. T., Parker, V., Kable, A. & Foureur, M. (2021). COVID-19

preparedness in aged care: A qualitative study exploring residential aged care facility managers' experiences planning for a pandemic. *Journal of Clinical Nursing*.

<https://doi.org/10.1111/jocn.15941>

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## **Experiences of visual telehealth consultation**

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Sunner, C., Giles, Michelle T., Kable, A. & Foureur, M. (2022). Experiences of nurses working in RACFs and EDs utilising visual telehealth consultation to assess the need for RACF resident transfer to ED: A qualitative descriptive study. *Journal of Clinical Nursing*, 32(15–16), 4694–4709. <https://doi.org/10.1111/jocn.16529>

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## **PACE-IT study results**

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Sunner, C., Giles, M., Oldmeadow, C., Ball, J., Hullick, C., Barker, R. & Foureur, M. (2023).

Implementation of a nurse-led intervention to augment an existing Residential Aged Care Facility outreach service with a visual telehealth consultation; stepped-wedge cluster randomised controlled trial.

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## Acknowledgements

First, I would like to thank my family, particularly my husband, who has been a great support to me and has been with me for all my challenges and accomplishments. My two children, who are taking it all in and have been inquisitive about further academic study as they comprehend the lifelong learning concept. I think they are as proud of me as I am of them.

My dear sister Mel, who has been my greatest fan, and me hers. We have both taken very different paths in life and have genuinely taken great joy in each other's achievements as if they were our own.

To Mum and my late Dad, thank you for your unconditional love and support, for encouraging me and believing in me. When I was younger, they provided an environment where my sister Mel and I were given a lot of freedom. My parents have always been supportive of my intellectual pursuits; their encouragement, support and stimulating conversations and interest in all topics have helped me hone ideas and research thoughts. Mum started proofreading some of my papers until they became too complex. She is an amazing wordsmith and a grammar whizz. My dad has always been very supportive and never made my sister and I feel we could not achieve or do anything. Thank you, Mum and my late Dad.

I would like to acknowledge my friends who have been genuinely proud of my progress. I have grown to further understand the importance and loyalty of friends and colleagues during this PhD. To my friends and colleagues Donna Howarth, Jenny Rutherford, Jean Ball, Belinda Korneliussen, Robyn and Jade Starkey, Fiona Carmicheal, Jocelyn Barker and, most recently, Mark Hopwood and Sharon Boutell.

The PACE-IT research team really helped support me through the PACE-IT planning and implementation stages, including Jean Ball, Michelle Wyborn, Kamana Bantawa, Se Ok

Ohr, Evelyn Palaminos-Lettier, Vicky Parker, Sarah Hindmarsh, Roslyn Barker, Cate E'ste, Gena Lieschke and Sophie Dilworth. There was so much detail to get through in the first six months that I could not have done without you all. All the help was delivered with a sense of humour and efficiency, for which I am truly grateful. A special shout out to Jean Ball, who crunched the numbers almost to death for this project. Thank you.

Finally, to my supervisors Maralyn Foureur, Michelle Giles, Ashley Kable (February 2020 – January 2023) and Kerry Inder (January–July 2023). They have been on this journey with me and have provided the constructive criticism and support I needed to progress this PhD in a timely way. Thank you to Michelle Giles, who worked with me to develop this opportunity to convert the PACE-IT project into a PhD in early 2019 when she sat with me for an hour as I pitched this idea to her. Without her belief in my idea, I would not be where I am today. I had the privilege of receiving amazing mentorship and opportunities from all four supervisors for this, and I am truly grateful.

A special thank you to the RACF nurses and all residents who participated in the PACE-IT project, especially one resident, Nancy, aka Val, whom I refer to in this thesis. Val starred in the PACE-IT information film ([https://www.youtube.com/watch?v=94C\\_C7lw4ho](https://www.youtube.com/watch?v=94C_C7lw4ho)) and encouraged her family to participate in the production. She passed away shortly after starring in the film, and I am so grateful to her for her support and the time I spent with her.

Capstone Editing provided copyediting and proofreading services, according to the guidelines laid out in the university-endorsed national 'Guidelines for Editing Research Theses'.

## Conference presentations during candidature

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2019	<b>Telehealth Strategic Advisory Group</b> —Sunner, C. & Giles M. T. Partnership aged care emergency interactive telehealth: Integration of visual telehealth assessment and information sharing and decision-making. 16th August 2019.
2019	<b>The Agency for Clinical Innovation (ACI) Health Care Network</b> —Sunner, C. & Giles, M. T. PACE-IT project overview, ACI webinar. 17th October 2019.
2020	<b>Frailty Forum 2020</b> —Sunner, C., Giles, M. T., Parker, V., Bantawa, K., Kable, A. & Foureur, M. PACE-IT—Partnerships in aged care emergency services using interactive telehealth. <b>The ACI</b> , Kirribilli Club, Lavender Bay, NSW. 7th February 2020.
2020	<b>Digital Health Institute Summit, Australasian Institute of Digital Health</b> —Sunner, C., Giles, M. T., Bantawa, K. & Foureur, M. Conference Hyatt Regency Sydney—161 Sussex Street. 17th November 2020.
2021	<b>Clinical Engagement and Patient Safety   eHealth NSW</b> —Sunner, C. & Giles, M. Key focus area PACE-IT progress, the virtual care accelerator. 25th February 2021.
2021	<b>Clinical Engagement and Patient Safety   eHealth NSW</b> —Sunner, C. & Giles, M. KFA 1 capability session, the virtual care accelerator. 31st March 2021.
2021	<b>The Australian Nursing and Midwifery Conference 2021</b> —Sunner, C., Foureur, M., Sunner, C., Giles, M. T., Ball, J., Ohr, S. & Bantawa, K. The PACE-IT project NEX conference venue, Union Street, Newcastle. 5th May 2021.

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2021	<b>21st Successes and Failures in Telehealth</b> —Sunner, C., Foureur, M., Giles, M. T., Ball, J., Ohr, S. & Bantawa, K. The PACE-IT project. Presented via webinar. 5th November 2021.
2022	<b>School of Nursing and Midwifery Symposium</b> —Sunner, C., Foureur, M., Giles, M. & Ball, J. PACE-IT qualitative findings for study. 10th November 2022.
2023	<b>Australian Nursing and Midwifery Conference</b> —Sunner, C., Foureur, M., Sunner, C. & Giles, M. T. PACE-IT implementation findings. 5th May 2023.
2023	<b>MedInfo23 Australasian Institute of Digital Health (AIDH)</b> —Sunner, C., Foureur, M., Sunner, C. & Giles, M. T. PACE-IT implementation findings. 10th July 2023.
2023	<b>UON HDR Student Festival</b> —Sunner, C., Foureur, M., Sunner, C. & Giles, M. T. PACE-IT implementation, and evaluation findings. 26 <sup>th</sup> September 2023.
2023	<b>23rd Successes and Failures in Telehealth</b> —Sunner, C., Foureur, M., Giles, M. T., Ball, J. The PACE-IT project, evaluation and implementation findings. Adelaide Convention Centre 28th November 2023.

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## Awards during candidature

### Winner

2021	<b>Hunter New England Health Excellence Awards, High Value Health Care Awards—winner 2021.</b> Sunner, C., Giles, M. T., Ball, J., Bantawa, K., Barker, R., Hullick, C., Rutherford, J. & Foureur, M. Category—integrated value-based care, ‘Do I REALLY need to go to the emergency department’. Nursing and Midwifery Research Centre.
2021	<b>Confirmation of the Year</b> —School of Nursing & Midwifery, \$400 prize. Research topic: Partnerships in Aged Care Emergency Services using Interactive Telehealth (PACE-IT) incorporating telehealth visual assessment, information sharing and decision-making for people living in residential aged care facilities (RACF).
2021	<b>Best paper award winner at the SFT-21 Conference</b> —\$100. Sunner, C., Foureur, M., Sunner, C., Giles, M. T., Ball, J., Ohr, S. & Bantawa, K., The PACE-IT project, 21st successes and failures in telehealth. Presented on 5th November 2021.

### Finalist

2021	<b>High Value Health Care Awards-Finalist 2021</b> —Sunner, C., Giles, M. T., Ball, J., Bantawa, K., Barker, R., Hullick, C., Rutherford, J. & Foureur, M. Secretary’s Award—Integrated value-based care category, ‘Do I REALLY need to go to the emergency department’, Nursing and Midwifery Research Centre.
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## Funding

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2019	<b>This project was funded by a grant awarded under the Translational Research Grants Scheme, Round 4, 2019, by the Ministry of Health, New South Wales, Australia (H19/53776). Co-investigator Dr Michelle Giles.</b>
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The reference lists for the published papers are contained within each publication. References pertaining to all other chapters are in the thesis reference list.

## List of abbreviations

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ACE	Aged care emergency
ACI	Agency of Clinical Innovation
ASET	Aged Care Services Emergency Team
CINAHL	Cumulative Index to Nursing and Allied Health Literature
CCA	Cost consequences analysis
ED	Emergency department
EMBASE	Excerpta Medica database
GP	General practitioner
HNE	Hunter New England
HREC	Human Research Ethics Committee
IRR	Incidence rate ratios
JHH	John Hunter Hospital
LHD	Local health district
LoS	Length of stay
Medline	Medical Literature Analysis and Retrieval System Online
MOC	Model of care
MoH	Ministry of Health
NASSS	Non-adoption, abandonment, scale-up, spread and sustainability
NSQHS	National Safety and Quality Health Service
NSW	New South Wales
NUM	Nurse unit manager
PACE-IT	Partners in Aged Care Emergency services using Interactive Telehealth
PHN	Primary health network
PMS	Patient management system
PRISMA	Preferred Reporting Items for Systematic Reviews and Meta-Analyses
RACF	Residential aged care facility
RCT	Randomised controlled trial
SD	Standard deviation
StaRI	Standards for Reporting Implementation Studies
TUQ	Telehealth usability questionnaire
VTC	Visual telehealth consultation

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## Abstract

**Background:** Transferring residential aged care facility residents to emergency departments (EDs) to access assessment and care for unplanned/acute health events is expensive, with up to 75% of residents transferred to EDs annually, exposing them to iatrogenic harm. The aged care emergency service in the ED provides outreach telephone support to residential aged care facility nurses to help improve decision-making and enable residents to remain in their homes when appropriate.

**Aim:** The Partnerships in Aged Care Emergency Services using Interactive Telehealth (PACE-IT) study aims to assess whether the augmentation of the telephone-based residential aged care facility emergency service with the addition of a visual telehealth consultation would reduce resident transfers to the ED compared to usual care.

**Study design:** A stepped wedge cluster randomised controlled trial was conducted in four public hospital EDs and 16 residential aged care facilities with 1,435 beds (mean = 87) in two local health districts in New South Wales (NSW), Australia. The study was powered to detect a 30% reduction in the primary outcome—transfers to the ED. Visual telehealth was added to an existing telephone based, Aged Care Emergency nurse-led outreach service unique to Hunter New England (HNE) Local Health District (LHD).

**Methods:** Feasibility and acceptability data were collected from focus groups, interviews and a survey of residential aged care facility nurses, together with primary outcome data extracted from electronic ED patient management systems from March 2020 to April 2021. Due to COVID-19, study commencement was delayed for many months. During this time, a qualitative study was undertaken to explore the COVID-19 preparedness of residential aged care facilities using in-depth interviews with 28 managers.



**Data analysis:** Primary outcome ED presentation data to identify residents transferring from participating residential aged care facilities to ED were compared between intervention and control periods using a generalised linear mixed effects regression model.

Secondary outcome data on feasibility and acceptability and the residential aged care facility manager interviews were analysed using Thorne's (2016) Interpretive Descriptive methodology.

**Results:** The COVID-19 preparedness study with residential aged care facility managers highlighted the urgent need for better pandemic response planning and management to meet residents' unprecedented healthcare and safety challenges.

Compared to pre-implementation, post-implementation of PACE-IT found a non-statistically significant 29% reduction (incidence rate ratio = 0.71 [95% CI 0.46, 1.09]) in ED presentations (per 100 residential aged care facility beds) that occurred within ED aged care emergency hours. A post hoc logistic regression demonstrated a significant 69% reduction (odds ratio 0.31 [95% CI 0.11, 0.87]) in ED presentations within ED aged care emergency hours. A review of the PACE-IT model of care's (MOC) long-term sustainability, feasibility and acceptability identified further resourcing needs.

**Conclusion:** The PACE-IT study has shown the feasibility and impact of visual telehealth communication between residential aged care facilities and the ED in reducing the unnecessary transfer of residents to EDs. These reductions are clinically important and impactful for residents and EDs. Sustainability of the PACE-IT MOC requires further investment in workforce and information technology resources in both residential aged care facilities and EDs to realise these benefits more broadly. The healthcare system as a whole will gain greatly from any decrease in resident presentations to a busy ED—especially for the individual older person who can recover safely in their residential aged care facility. This decrease will also aid in overcoming some of the challenges during a pandemic.

# **Chapter 1: Introduction**

In this thesis chapter a detailed examination is presented of whether implementing a novel telehealth intervention for residential aged care facilities (RACFs) in Australia can reduce the unnecessary transfer of residents to emergency departments (EDs). This chapter establishes the rationale for the research. This work holds significant potential to contribute to the well-being of residents in Residential Aged Care Facilities (RACFs) across Australia and in international settings with comparable healthcare. The impact of the COVID-19 pandemic on the planned research is also addressed and provides the rationale for a second study undertaken to investigate the pandemic preparedness of RACFs. This thesis begins by presenting an overview of the journey to this point and why this explore the topic of RACF residents being transferred out of their homes into the foreign environment of hospital EDs for assessment of medical issues, which could also be safely assessed and treated in the RACF. Section 1.1 of the thesis is written in the first person to describe the candidate's research journey.

## **1.1 My journey to this point**

In 2009, I was sitting in the intensive care unit waiting room at Royal North Shore Hospital, Sydney, waiting for a call from a surgeon. On the table next to me was a basket of wool and knitting needles designed, presumably, to introduce a bit of mindfulness for anxious relatives at this time; I was one of them. This was a tense time for us with a young family, and the additional worry on how this day would impact our lives. While I was knitting, waiting for news, I made a deal with myself that I would be doing things differently from now on, as life is too short to put off plans. Undertaking a PhD would be one such plan.

During the past seven years, I have worked as a registered nurse in the ED of a tertiary referral hospital in a large regional city in Australia. For most of that time, I worked

in the Aged Care Services Emergency Team (ASET), responsible for delivering safe and efficient patient-focused health care for older persons in the ED. The ASET nurse role was established to address the well-evidenced high risk of iatrogenesis for the older person while waiting for assessment and treatment in the busy ED (Dwyer et al., 2014; Morphet et al., 2015). The main objective was to ensure the older person was assisted appropriately and safely throughout their time in the ED and at home after being discharged from the ED or if they needed to be admitted to the hospital.

ASET nurses are also responsible for receiving telephone calls from the RACF outreach service. The outreach service is called the aged care emergency (ACE) service. The ACE service is based in the ED, staffed by experienced ED nurses (usually ASET nurses) who carry a mobile phone to receive calls from RACF nurses wanting to discuss the transfer of a resident needing assessment to the ED. ASET nurses use several evidence-based algorithms to assist the RACF staff in deciding whether to send the resident to the ED for assessment and management or to assist with arranging an alternative plan involving the resident's general practitioner (GP) and/or keeping the resident in their home using management advice provided by the ASET nurse.

My experience was that many RACF residents still came to the ED unnecessarily, even using the ACE service. Often the ambulance would have been called to transfer the resident to ED before the ACE service was contacted. The main concern was that there needed to be a way to support RACFs further so that residents did not have to be rushed to the ED unnecessarily. I was impressed when I learned about a pilot telehealth initiative at an ACE forum in 2016 (later published in 2022) (Hullick et al., 2022) that used iPads to visualise the resident in the RACF. I wondered how I could use this innovation to improve care for residents transferred to the ED where I worked.

The addition of the visual telehealth innovation to the ACE service was approved for trial by the ED manager. After successfully completing the pilot (unpublished), I then approached the manager of the Nursing and Midwifery Research Centre of Hunter New England (HNE) Local Health District (LHD), the LHD in which I was employed, to pitch the idea of undertaking a larger study. I helped develop an application for a major NSW Health grant to support a large study investigating this issue further. The study design was called Partnership in Aged Care Emergency Services using Interactive Telehealth (PACE-IT). The research team and I won a major grant from the NSW Ministry of Health's Translational Research Grants Scheme in 2019 that supported this study and a PhD.

The PACE-IT project involved a multitude of roles and responsibilities. The conceptualisation of the study and collaboration on the grant application were undertaken by the candidate in close coordination with the research team. As the project coordinator and a research candidate, I undertook many responsibilities including; the ethics application and submission, recruitment of RACFs and EDs, data collection for focus groups, writing the survey, data collection, thematic analysis, education session plan and delivery for participants, co-writing the concept for the information and instructional films and starring in them, database collation for analysis, organisational approvals, chairing many meetings and troubleshooting problems and issues. An external party analysed the data.

### **1.1.1 Background: The story of Nancy**

A promotional film for the study was developed featuring Nancy (pseudonym), a RACF resident who later became the face of PACE-IT, to increase RACF and ED staff engagement in the proposed research. Nancy provided personal insights into the experience of a RACF resident transferred from her home to ED for assessment. The film can be viewed at [https://www.youtube.com/watch?v=94C\\_C7lw4ho](https://www.youtube.com/watch?v=94C_C7lw4ho).

Nancy knew too well how visiting an ED can affect a frail older person. Due to her underlying condition, Nancy quickly contracted urinary tract infections and was susceptible to developing an associated hypoactive delirium. Hypoactive delirium manifests as drowsiness and inactivity and can be misinterpreted as the affected person simply being tired. Nancy often arrived at the ED unable to communicate her needs because of delirium and without any accompanying RACF staff or family member to advocate for her care on her behalf. Nancy was incontinent of urine and needed effective pressure relieving devices due to her high risk of pressure injuries. Nancy was therefore placed in a vulnerable position when she presented to the ED, unable to ask for help and in the often-busy overburdened ED. Nancy had many presentations to the ED, and the prospect of presenting to the ED made her very apprehensive. After her ED assessment, Nancy almost always required a hospital admission to an inpatient ward where she would spend at least a week receiving medical care unavailable in her home. In her RACF home, Nancy was able to move around independently in her motorised wheelchair, something that was not possible while in the hospital, where she was dependent on all care and was not mobile at all.

Nancy and her family enthusiastically participated in preparing the promotional video for the PACE-IT study as they could see its potential benefits to themselves and others. They were able to demonstrate the potential use of telehealth as an aid to effective communication and decision-making. From then on, they embraced the iPad for daily family chats. Sadly, Nancy died in November 2021. Her family said they were proud of her for participating in the PACE-IT project and thankful they had the film she starred in as a keepsake.

### **1.1.2 Risks of Emergency Department admission for Residential Aged Care Facility residents**

Nancy was one of the 201,000 residents living in RACFs in Australia that may be transferred to an ED for assessment or treatment (Department of Health and Aged Care

[DoHAC], 2017). This figure has increased by 17% over the past decade and, as evidence suggests, will continue to increase as our population ages (DoHAC, 2017). Many studies assert that transferring RACF residents to ED is common, risky and expensive (Dwyer et al., 2014). One USA study reported that the cost of complications for the older population from an ED presentation was estimated to be more than US\$2.6 billion in Medicare expenditure (Walsh et al., 2012). RACF residents are more likely to present to EDs than any other population group, be readmitted, have a longer length of stay (LOS) and face increased risks of hospital-acquired complications, including delirium, falls, medication errors, pressure injuries and death (Dwyer et al., 2014; Hullick et al., 2016; Marsden et al., 2018). Additionally, residents are three times more likely to contract a respiratory or gastrointestinal infection following a presentation to the ED (Quach et al., 2012). People living in RACFs often have many comorbidities, cognitive deficits and mobility impairments that increase the complexity of their care needs when in the ED. All these issues make the transfer to an ED a stressful and risky event for residents of RACFs and add to the already overburdened workload of the ED.

### **1.1.3 Preventable Emergency Department presentations**

The overburdened ED is an international health issue that is escalating (Lucke et al., 2022). Potentially avoidable or preventable hospital transfers of older persons from RACFs in the USA reportedly account for 67% of admissions to hospitals, with a cost of 9 billion US\$ dollars annually (Gillespie et al., 2019). Similarly, the findings of a Canadian study reported that 25% of transfers of residents from aged care facilities to EDs were for ‘potentially preventable conditions’ (Grant et al., 2020). The situation of potentially avoidable hospital transfers is echoed in Australia. In two Australian studies, the incidence of transfer from RACF to ED is > 30 transfers/100 RACF beds/year (Arendts & Howard, 2010), with at least 40% of transfers not admitted to hospital (Arendts & Howard, 2010; Morphet et al., 2015).

This means a proportion of residents transferred to the ED could have remained in the RACF for treatment.

In Australia, the primary healthcare provider for RACF residents is the GP. The GP recommends that residents be transferred to an ED as a first option when other options might be available (Grabowski & O'Malley, 2014) or particularly when the GP is unavailable. One identified cause of GP unavailability is the poor remuneration for RACF-resident visits for GPs in Australia (Burgess et al., 2015). If the GP cannot attend on time, the immediate alternative is to send the resident to the ED.

The GP is not always available to provide clinical advice when the RACF resident becomes unwell. Without this advice, RACF nurses have limited options, one of which is for the resident to present to an ED where they may experience prolonged wait times and LOS. This LOS can place the resident in an environment where there is an increased risk of iatrogenic complications leading to high morbidity and mortality (Grant et al., 2020). RACF residents are generally more complicated and more unwell than their community counterparts (Gillespie et al., 2019), which can pose unique challenges for ED clinicians. There is mounting evidence that implementing strategies before transferring RACF residents to the ED can help mitigate the cost and potential compromises to the quality of care for the older person (Arendts et al., 2013; Dwyer et al., 2014).

In a systematic review by Dwyer et al. (2014), seven studies reported that 1–5% of residents transferred to the ED died there. A cohort study by Wang et al. (2011) of all RACF resident ED presentations between 2005 and 2008 ( $n = 9,104,735$ ) in the USA found pressure ulcers were 19% and delirium was 38% of all complications; up to 80% experienced potentially invasive interventions. Further, a RACF-resident ED presentation was associated with three times the risk of contracting a respiratory tract infection or gastroenteritis ( $n = 424$ ) (Quach et al., 2012). The ED plays a vital role in providing care for RACF residents;

however, it can potentially place the resident in the path of unnecessary risks. As the candidate identified in her own experience as an ASET nurse in an ED, there is a need for a strategy to help provide alternatives to the ED while providing clinical support and management for RACF residents in their own homes.

#### ***1.1.3.1 Telehealth: Enhancing communication (or a mitigating strategy)***

As discovered in the ACE forum in 2016 (described above), one strategy reported to optimise the quality of care for residents is using telehealth to enhance communication between the RACF and the ED (Jarvis-Selinger et al., 2008). Telehealth using both voice and vision can address the poor availability of clinical expertise and resources in the RACF by enabling the remote viewing of the resident's physical condition and behaviour and hearing it directly from the resident and the staff (Gillespie et al., 2019). Expert clinical advice and support can then be provided to the RACF staff before the resident is put into an ambulance and transferred to the ED, which may even mitigate the need for transfer.

The many definitions of telehealth describe it as a moving and dynamic communication tool that can adapt to the care recipient's medical needs in many ways and contexts. Telehealth and telemedicine are terms that are often used interchangeably. They are both performed in real time, involving synchronous voice and vision data transmission. Telemedicine is often used to describe occasions where a physician is assessing and prescribing treatment, whereas telehealth can include consultation with various health professions (World Health Organization [WHO], 2009).

Typically, telemedicine/telehealth requires establishing a fixed computer in an office located in a healthcare setting some distance apart, such as in an urban environment where the expert physician is located and a rural health setting where the patient is. A major innovation was to utilise a portable/mobile device such as an iPad or electronic tablet (e-tablet) that could be made available at the resident's bedside in the RACF and another in the



hands of the clinician in the ED. In this thesis, the term ‘visual telehealth consultation’ (VTC) will be used to describe the model used in the PACE-IT study.

Most recently, the COVID-19 pandemic has been a catalyst for the increased use of and need for avoidable transfers to EDs. In Australia and elsewhere, lockdowns were mandated in RACFs to protect vulnerable residents from the COVID-19 virus. Transmission of the virus from the community to the residents from visitors was considered high risk. Justifiably, clinicians are looking for ways to facilitate assessment from a distance while keeping the care recipient front and centre during the pandemic. Including telehealth as a communication tool for RACF nurses can also offer enhanced access to teaching and learning, knowledge and skill development for RACF nurses who also need education support (Arendts & Howard, 2010).

The outreach service provided by the ACE service has shown great potential in linking RACF nurses with the correct information to assist in their decision-making; however, it is usually restricted to the phone only. A nurse-led ACE model, together with telehealth video capability, can potentially optimise the benefits of both ACE and telehealth addressing avoidable RACF transfers. The feasibility of employing visual telehealth in both the Emergency Department (ED) and a Residential Aged Care Facility (RACF) was confirmed through a preliminary proof of concept conducted in a Local Health District (LHD). The findings of this proof of concept, though not published, indicate positive prospects for utilising visual telehealth in these healthcare settings. Therefore, an appropriately powered and well-designed study to implement a telehealth intervention to enhance ACE is well justified.

#### ***1.1.3.2 PACE-IT and COVID-19***

At the beginning of 2020, everything was in place for the commencement of the PACE-IT project with the participating RACFs to investigate whether telehealth could

improve outcomes and prevent unnecessary hospitalisations of RACF residents. On the 25th of January 2020, Australia had its first case of COVID-19 reported according to the Australian Department of Health and Aged Care and the pandemic escalated quickly, which led to a decision made in March to suspend the project for at least three months and reassess the viability of continuing.

Like the rest of the world, Australians had limited understanding into how long the pandemic would continue to impact our daily lives and the lives of RACF residents. Australians watched with alarm as the RACF-resident population death rates climbed, as this was the population group impacted hardest by the pandemic. It seemed that telehealth would be a great opportunity to strengthen care for older people in RACFs; however, for PACE-IT, it was just not feasible at the time. It was the right thing to do and try and find a way to proactively adapt to the change in circumstances.

The research team viewed the three-month suspension as a unique opportunity rather than the end. This time gave the research team a chance to speak with the RACF managers in our LHD and learn how COVID-19 has affected their access to visual telehealth. After developing a protocol and submitting an ethics application, the candidate started the investigation into 'COVID-19 preparedness in aged care'. Here a connection was made with 28 RACFs and conducted interviews to gain insight into how the care for vulnerable, older RACF residents was evolving in this dynamic space. This became an additional study contributing to the candidate's PhD and is detailed in Chapter four. This additional study added important contextual insights into how managers of RACFs manage risk for their residents.

#### **1.1.4 Justification for the study**

There is strong evidence that residents' lives and wellbeing are at risk if they are unnecessarily transferred to busy EDs. This study proposes a way to prevent unnecessary ED

transfers of a vulnerable population. Visual telehealth communication between the ED and the RACF using an iPad has been piloted and shown to be feasible; therefore, it needs to be carefully studied to provide evidence to support its use more widely in similar settings. Telehealth outreach models can further support RACF staff to care for residents in RACFs with the opportunity for enhanced access to teaching and learning to help prevent unnecessary hospital presentations and/or treat the older person in the RACF. Managing the older person in their RACF prevents exposure to dangerous pathogens, unnecessary interventions or neglect while waiting for care in an acute setting. The COVID-19 pandemic has added to the burdens of an already stressed healthcare system and a relatively poorly funded and under-resourced aged care system (Royal Commission into Aged Care Quality and Safety, 2021a). Avoiding an unnecessary transfer to the ED by ambulance could also result in significant cost savings. Consequently, the PACE-IT study was designed to address these issues, and it is described in the following chapters as outlined in the following thesis structure.

## **1.2 Thesis structure**

The following six chapters of this thesis incorporate four publications and an article submitted and currently under review.

**Chapter 2** a scoping review of the literature is presented, considered the best approach because of the limited amount of quality research in this field. Primary research was identified, synthesised and analysed around the key concepts and emerging evidence of how telehealth influences decision-making in transferring RACF residents to the ED. The review found that although telehealth was acceptable to clinicians, there were still barriers to uptake. The findings from this scoping review assisted with developing the PACE-IT study aims and objectives around barriers and enablers for implementing a telehealth strategy in an Australian setting.

**Chapter 3**, the study design and methods are presented in this chapter, as is the protocol for the PACE-IT study. The study protocol provided the details of how the study was conducted. The protocol described a stepped wedge cluster randomised controlled trial (RCT) evaluating the implementation of telehealth visual assessment in emergency care for people living in RACFs. An explanation of the methodology—including the sampling strategy and power of the study, the inclusion criteria, sources of data, data collection and how the analysis would be conducted—are presented in the protocol. There were 16 RACFs and four EDs involved in the study. The intervention was deployed to the RACFs over eight months. The normalisation process theory (NPT) provides a framework to guide the successful implementation and integration of a set of complex interventions into routine practice.

**Chapter 4** is an opportunistic qualitative study of the COVID-19 preparedness of 25 Australian RACFs in one LHD. This study was undertaken during the period of suspension of the PACE-IT study due to the onset of COVID-19. A convenience sample of managers of 25 RACFs was interviewed about their experiences relating to COVID-19 preparedness and responsiveness that painted a picture of what was happening in both public and privately funded facilities of various sizes. In this study, the findings provided valuable insights into the current challenges in responding to the COVID-19 crisis for RACF managers. The lack of internet infrastructure in RACFs, seen as a low priority in resource-poor facilities, was identified as a significant barrier to the widespread use of telehealth-enhanced communication between the ED and RACF.

**Chapter 5** is the first findings from the PACE-IT study utilising data collected in focus groups with RACF and ED staff. This component of the PACE-IT study explored a deeper understanding of experiences of VTCs from the RACF and ED nurses engaged in implementing PACE-IT. This chapter, the qualitative findings from six focus groups with

ASET and RACF nurses. A thematic analysis identified four overarching themes; facilitated person-centred care; built confidence, relationships, and trust; enabled bi-directional communication that strengthens decision-making; and limited technology access. However, there were issues with technology access, connectivity and usability between the acute care setting and the RACF. This chapter provides valuable information concerning how VTC can improve and support clinical practice and decision-making for nurses in RACFs and EDs for unwell RACF residents.

**Chapter 6** is the quantitative data results of the primary and secondary outcomes for the PACE-IT project using a stepped wedge cluster RCT design to evaluate the implementation of a nurse-led intervention to augment an existing RACF outreach service using VTC. This chapter provides evidence that supports the positive impact of augmenting ACE with a VTC and its clinical importance and effect on RACF residents and EDs. These findings are currently under review in the *Journal of Clinical Nursing*.

**Chapter 7** is the concluding chapter of the thesis. The integration and discussion of the findings are presented together with an analysis of the strengths and limitations of the PACE-IT study and recommendations for clinical practice and further research. The non-adoption, abandonment, scale-up, spread and sustainability (NASSS) framework is utilised to explore the PACE-IT project's future feasibility and implementation requirements.

### **1.3 Summary**

This chapter has furnished background information for the thesis, elucidating the motivation behind the emphasis on enhancing care for vulnerable older individuals residing in Residential Aged Care Facilities (RACFs) and to help further prevent unnecessary transfers of residents to the ED. The rationale for implementing a telehealth intervention to augment the existing ACE service in EDs provided the justification for the study. An outline

of this thesis's structure and each chapter's content has also been presented. The next chapter is the scoping review of the literature on telehealth use in hospital avoidance strategies.

## **Chapter 2: A scoping review of the literature**

In this chapter the scoping review of the literature on RACF-resident hospital avoidance using telehealth is presented. This review is presented as a peer-reviewed publication which aimed to synthesise the information available to determine the gaps in knowledge about and if there had been any effective ED nurse-led visual telehealth outreach services. At the time of commencing the project, there was no published literature about ED nurse-led outreach models of care identified.

## 2.1 A scoping review on the telehealth model of care



Received: 17 September 2021 | Revised: 7 September 2022 | Accepted: 29 October 2022  
DOI: 10.1111/opn.12517

### ORIGINAL ARTICLE

International Journal of  
Older People Nursing WILEY

# Does telehealth influence the decision to transfer residents of residential aged care facilities to emergency departments? A scoping review

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#### Funding information

Department of Health, New South Wales  
Government, Grant/Award Number:  
Translational Research Grant Scheme  
H19/53776; Ministry of Health, Grant/  
Award Number: H19

#### Abstract

**Background:** Emergency Departments (ED) can be crowded places and not ideal environments for Residential Aged Care Facilities (RACF) residents awaiting assessment. Assessment and care planning may be made available via telehealth thereby avoiding unnecessary transfer to ED, without compromising the quality of care for the older person. Telehealth is attractive addition to improving healthcare decision-making in RACFs.

**Objectives:** The aim of this scoping review is to explore the evidence around the use of telehealth and whether it influences the decision to transfer residents of RACF to ED.

**Methods:** All peer reviewed literature that focused on RACFs, decision-making and assessment of residents using telehealth in real time, was included. All study designs, pilot studies and some systematic reviews were considered. Databases Medline, Embase and CINAHL were used in this search in June 2022. Search terms were a combination of the population: RACF residents, decision-making and assessments using telehealth, and or transfer to the ED. The search was assisted by a senior university research academic librarian/information specialist and reviewed by senior researchers. The PRISMA-ScR guidelines were used to report this study.

**Results:** Of the 124 articles initially identified, 31 were eligible for inclusion for synthesis. The date range of the included studies was 2001 to 2022, with 15 published in the last five years. Critical appraisal was conducted using the Mixed Methods Appraisal Tool.

**Conclusion:** This scoping review has mapped evidence that telehealth has been widely used in multiple settings. The association between the use of telehealth with improved clinical outcomes highlights its potential utility in enhancing care delivery for an older

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*Int J Older People Nurs.* 2022;00:e12517.  
<https://doi.org/10.1111/opn.12517>

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population in RACFs. Telehealth has shown that it can improve the decision-making for residents in RACFs, but more robust research designs are needed.

**Implications for practice:** Using video/telehealth appears to improve RACF staff access to expert clinicians who can then assess and jointly plan care/management that can be provided in the resident's home. Knowledge and skills of RACF staff appear to be improved through joint assessment and decision-making with the use of video/telehealth access to expert clinicians.

#### KEYWORDS

care homes, care of older people, decision-making, emergency Department, gerontological Nursing, long-term care, residential care, telehealth, transfer

## 1 | INTRODUCTION

Hospitalisation of residential aged care facility (RACF) residents can potentially affect their quality of life, expose them to unnecessary health risks and increase their mortality and morbidity. Emergency departments (ED) can be crowded places and not ideal environments for residents awaiting assessment. With prolonged wait times and length of stays (LOS) in ED, residents are at risk of iatrogenic complications and adverse events (Grant et al., 2020). It would be beneficial for RACF residents to have access to viable alternatives to ED thereby avoiding unnecessary health risks. Alongside the risk of being in ED, is the fact that the resident's visit may have been unnecessary, as found in studies in the United States and Canada, where 67% and 25% (respectively) of RACF-resident presentations were potentially avoidable (Gillespie et al., 2019; Grant et al., 2020).

Alternative care pathways and health management plans for RACF residents rather than an unnecessary and risky hospital visit is worthy of consideration. Cost-effective strategies like telehealth are an attractive addition to improving the provision of healthcare within RACFs (Chan et al., 2001). Telehealth may support the RACF staff to make better decisions about the care required and available care options. There is evidence that adding a visual assessment to a telephone consultation can improve the quality of care and clinical decision-making (Jarvis-Selinger et al., 2008) for RACF residents. The Internet boom has led to the expansion of telehealth/telemedicine applications available for use globally (WHO, 2009), which has made telehealth technology more accessible.

## 2 | BACKGROUND

There are many descriptions of telehealth that identify it as mobile and dynamic communication tool, adaptable to the medical needs of the care recipient in many ways and across many contexts. Telehealth and telemedicine are terms that are often used interchangeably. For the purpose of this paper, we will refer to any interaction that uses real-time visual assessment consultation as telehealth, including telemedicine. They are both performed in real time involving synchronous data transmission. Telemedicine is

### Summary statement of implications for practice

What does this research add to existing knowledge in gerontology?

- This scoping review has mapped evidence describing the use of telehealth-aided decision-making in multiple settings.
- Residents are transferred out of their home when staff are unable to make confident, informed decisions about the management/treatment of the resident, in situ, in their own home.

What are the implications of this new knowledge for nursing care with older people?

- Using video/telehealth appears to improve RACF staff access to expert clinicians who can then assess and jointly plan care/management that can be provided in the resident's home.
- Knowledge and skills of RACF staff appear to be improved through joint assessment and decision-making with the use of video/telehealth access to expert clinicians.

How could the findings be used to influence policy or practice or research or education?

- More research using robust study designs needs to be undertaken to support or refute the hypothesis that video/telehealth can improve health outcomes for residents in RACFs.
- Cost savings can be made if residents are able to receive expert care and support in their own home rather than transfer to an ED.
- Providing care for residents in their own home should become recommended government policy.

often used to describe occasions where there is a physician or health professional who is assessing and prescribing treatment via the use of telehealth (WHO, 2009). Telehealth fits with the definition from the International Organisation for Standardisation that defines

telehealth as the use of telecommunication techniques for the purpose of providing telemedicine, medical education and health education over a distance (ISO, 2021).

Telehealth provides a way of reducing inequalities in health care by delivering knowledge, resources and skills to support staff in rural communities where they do not have ready access to clinical expertise (Nesbitt, 2012). Teleradiology is an example of a critically important acute care telehealth service provided to rural hospitals to assist in the rapid diagnosis of patients with traumatic injuries and strokes. Telestroke is a model telehealth service because of its documented improvements in patient outcomes and the strong economic case that can be made for implementing the service (Weinstein et al., 2014).

Teletrauma, teleburn and telestroke programs (Weinstein et al., 2014) bring capability and urgent assessment and treatment to areas that do not have such specific clinical expertise. In ophthalmology and optometry, non-mydriatic cameras can be used to perform retinal screenings in people with diabetes without needing to dilate the eyes, and this has increased screening rates. Correctional telehealth contributes to not having to transport prisoners to outside clinics and protecting public safety (Weinstein et al., 2014). Examples of telehealth include, but are not limited to, telepaediatrics, telecardiology, teledermatology, teleinfectious disease, teleneurology, teleophthalmology, telepathology, telepulmonology, telepsychiatry, telerheumatology and telenursing (Weinstein et al., 2014).

In recent years, there has been a rapid uptake of technology internationally. This has intensified the scope and availability of telehealth, utilising Web-based applications (e.g. e-mail, teleconsultations and conferences via the Internet) and multimedia approaches (e.g. digital imagery and video) (WHO, 2009). Staff and patient satisfaction have increased in the past few years, probably due to familiarity with, and improvements to technology (Weiner et al., 2001). Despite these technological advances, the use of telehealth has not progressed as rapidly as expected.

Despite the availability of ready to use telehealth devices in industrialised and developing countries (Wootton, 2008), the process of activating telehealth conversations is not straightforward (Weinstein et al., 2014). Reasons for this are reported to be the lack of standards (Nesbitt, 2012), poor progress once initial 'seed' money dries up (Wootton, 2008), lack of financial incentives and poor technology integration (Weinstein et al., 2014). There is also the problem of competing workload commitments for the staff in RACFS caring for residents with higher health needs who require extensive support (Gillespie et al., 2019). Furthermore, it is challenging to maintain the clinical skills needed for RACF staff when there are high staff turnover rates (Gillespie et al., 2019), this is a valid concern for implementation planning. In addition, negative staff attitudes towards telehealth can have an impact on telehealth implementation (Crundall-Goode & Goode, 2014).

This paper presents a scoping review of the literature to identify evidence of the effectiveness and experience of telehealth use in RACFs to assist the decision-making of RACF staff regarding

the transfer of the resident to ED. Limited literature seems to be available describing or evaluating how a telehealth model of care can prevent RACF residents from presenting to EDs. A scoping review of the literature will identify what information is available in all clinical areas to understand the barriers and enablers to telehealth, and if telehealth improves the clinical decision-making, and how an intervention can be implemented successfully into practice.

A scoping review is considered less restrictive than a systematic review with search criteria allowing a broader scope for literature searches (Munn et al., 2018). In addition, in a scoping review, information can be drawn from any source and is not restricted to quantitative studies (Munn et al., 2018). In the case of RACF-resident transfers to ED, a scoping review will be invaluable in identifying existing evidence (Munn et al., 2018) and help the reader understand the key concepts and concerns of an approach rather than describe the efficacy and viability of interventions that a systematic review provides. The scoping review potentially provides an overview or a map of the evidence and clarification of definitions (Munn et al., 2018).

## 2.1 | Aim

The aim of this scoping review is to explore if the use of telehealth and whether it influences the decision to transfer residential aged care facilities residents to emergency departments.

## 3 | METHODS

Our protocol was developed using the scoping review methodological framework proposed by Arksey and O'Malley (2005) and further refined by the Joanna Briggs Institute (JBI) (Peters et al., 2020). A scoping review of the literature as outlined by Arksey and O'Malley (2005) was undertaken to examine the extent, range and nature of the research undertaken in this area, to assist in summarising the research findings, and identify gaps in the existing literature. As Peters et al. (2020) describe, scoping reviews differ from other reviews in that, they are used to present a broad overview of the evidence, regardless of the quality of the study and are considered a precursor to a systematic review. They are useful to uncover emerging data, clarifying key concepts and identifying gaps (Peters et al., 2020). The Scoping review was completed in six stages as recommended by (Arksey & O'Malley, 2005) 1. Identifying the research question; 2. Identifying relevant studies; 3. Study selection; 4. Charting the data; 5. Collating, summarising and reporting the results; and 6. Consultation (with information specialist librarian). This study followed the Preferred Reporting Items for Systematic reviews and Meta-analysis Extension for Scoping Reviews (PRISMA-ScR) guidelines (Tricco et al., 2018) see File S1 and the ENTREQ Statement (Enhancing the transparency in reporting the synthesis of qualitative research) File S2.

### 3.1 | Search strategy

The search strategy for this scoping review was developed with assistance from a university research librarian/information specialist, following the JBI framework to determine eligibility of the search question (Peters et al., 2020) including studies that assessed;

1. The population: RACF residents (65 years or older),
2. Concept: decision-making and assessments using telehealth,
3. Context: transfer to the ED.

The full electronic search strategy was refined in the Medline database, including any limits used, such that it could be repeated and is presented in File S1. These search terms were also used in subsequent searches of databases, Embase and CINAHL, with all papers fitting search criteria to July 2022. All relevant articles retrieved from this search strategy were included for screening. Additional studies were identified by manually searching the reference lists of potentially relevant papers and other telehealth/telemedicine systematic reviews. All articles identified were imported into Covidence Systematic Review Software for screening File S3.

### 3.2 | Eligibility criteria

#### 3.2.1 | Inclusion criteria

All peer reviewed literature that focused on RACFs, decision-making and assessment of residents using telehealth in real time were included. All study designs using recognised methods of data collection and data analysis including, some pilot studies and some systematic reviews were considered, and only studies reporting evidence relating to RACFs were included. Studies were included if they were in English language only.

#### 3.2.2 | Exclusion criteria

Articles not pertaining to telehealth, decision-making or integrating patient care in real time with telehealth were not included, along with discussion papers/editorials or papers which only have abstracts available.

### 3.3 | Information sources

#### 3.3.1 | Title and abstract

Title and abstract screening was completed in Covidence Systematic Review Software. The inclusion criterion was followed as above, for the title and abstract screening. Review articles, conference abstracts, posters, editorials and commentaries were excluded from the review.

#### 3.3.2 | Full text screening

Full text screening was also completed in Covidence Systematic Review Software. Papers included were based on blinded review by two authors using the following four main concepts:

1. Telehealth, telemedicine (visual/video/real-time);
2. Nursing homes, long-term care homes, RACFs or alternatives;
3. Decision-making and/or assessment;
4. Emergency service and/or alternative.

When the screening was completed by two independent reviewers, the conflicts were managed and resolved by discussion between the two reviewers, including a third reviewer when necessary.

### 3.4 | Data extraction and analysis

A data extraction form on Microsoft Excel was used to guide the collection of information from each article. The following descriptive data were extracted from each article that satisfied the inclusion criteria: year of publication, language, country, study design and study setting. For completed studies (not protocols), participant demographics were extracted, including number of participants, and participant age and sex. With respect to telehealth, we extracted information about persons who undertook telehealth consultations, and assessment. All outcomes and variables that studies assessed for a telehealth relationship with RACF residents, assessment and emergency were recorded. As numerous outcome variables were identified, outcomes were grouped according to overarching themes for the purpose of analysis.

## 4 | RESULTS

Our database search retrieved 4939 articles and hand-searching identified 25 additional articles for a total of 4964. After duplicates were removed, articles were included for title and abstract screening. We screened the full text of 124 articles these were further assessed till we were able to retrieve 31 papers for this scoping review that fitted our criteria. The findings from this search process are presented in Figure 1.

### 4.1 | Critical appraisal of individual sources of evidence

The quality of the reported studies was appraised using the mixed methods appraisal tool (MMAT) (Hong et al., 2018). The rationale for using the MMAT tool was that it was able to assist appraisal across different study designs and methodologies using only one tool. The MMAT tool was created and validated to assess the methodological quality of five categories of studies: qualitative research, randomised controlled trials, non-randomised studies, quantitative descriptive studies and mixed method studies (Hong et al., 2018).



## Figure 2.1

### Prisma Flowchart

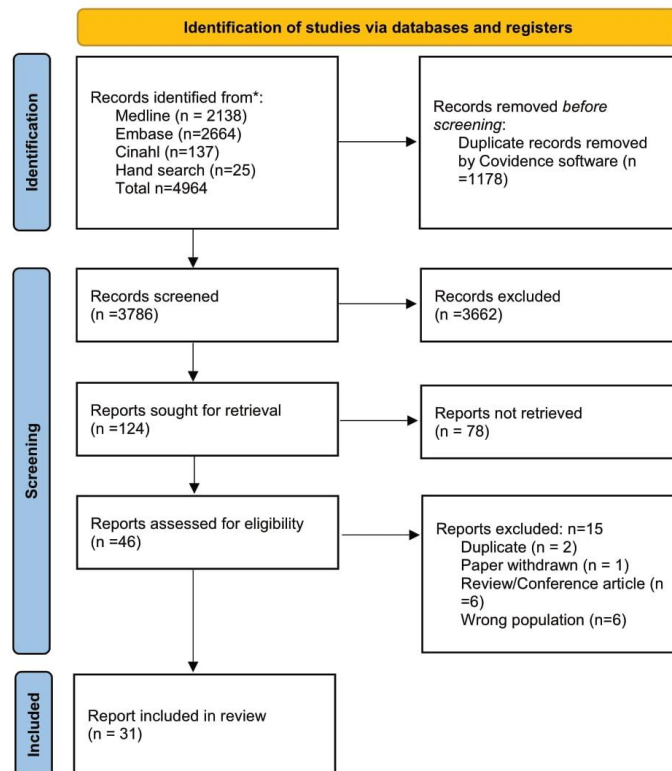
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FIGURE 1 Prisma flowchart (Page et al., 2020)



Whereas it is not mandatory to utilise a tool for critical appraisal in a scoping review, the authors felt that the inclusion of the MMAT would provide rigour, reduce bias and a uniformed approach towards appraisal of the studies found.

The MMAT (Hong et al., 2018) measures overall quality, with two initial questions where further appraisal may not be needed if the answer is no to one or both screening questions. All the papers were critically appraised by the first author and divided up evenly between the other authors of this paper, so all studies were appraised by two people independently. Any discrepancies were discussed until a consensus was reached. Six of the papers were identified as poor in quality (scoring 4 or below) but were still included in the Evidence Table (Table 2).

#### 4.2 | Data charting process

An overview of each included paper is provided in Table 1. This evidence table provides further details of the authors, year of publication, country, context, aim, study design, sample data collection methods and analysis, outcomes/ findings, MMAT score and limitations.

#### 4.3 | Synthesis of results

##### 4.3.1 | Description of studies

**Authors** of the 124 articles identified for full text review, 31 were eligible for inclusion in our synthesis and are presented in the Evidence Table describing studies included in the scoping review (Table 1).

**Date**, the date range of the studies was 2001 to 2022, with 15 published in the last 5 years.

**Country**, the various countries represented in this review are described in the Evidence Table (Table 1). Most studies were from the United States (n = 15) followed by Hong Kong (n = 4) and Australia (n = 3), two each from Singapore, France and the UK, and one each from Germany, Italy and Canada.

**Context**, for the purpose of this review, we use the range of terms found in the studies where RACFs are referred to as; elderly homes, nursing homes, skilled nursing facility (SNF), long-term care and assisted living facility. The RACFs were located across a mix of urban and rural environments. The studies were led by different discipline groups, including pharmacists (Kane-Gill et al., 2021), General Practitioners (GP) (Ohligs et al., 2020; Weiner et al., 2001), specialist physicians (Wakefield et al., 2004) geriatricians (Catic

Table 2.1

## Evidence Table Describing Studies

TABLE 1 Evidence table describing studies included in the scoping review

Authors date country	Context	Aim	Study design	Sample	Data collection methods and analysis	Outcomes/findings	MMAT score	Limitations
RCT								
Grabowski & O' Malley, 2014, USA	NH* a mix of post-acute and long-stay residents	To determine whether residents of NH that were randomly chosen to receive off-hours physician coverage by a telemedicine service experience a lower rate of hospitalisation, compared to residents of homes that received standard physician coverage.	RCT	11 NH (6 control 5 intervention)	NH demographics, hospital transfers, monthly data number and reasons for telehealth calls.	Reduction in hospitalisations: control group 5.3%; intervention group 9.7%, however, the difference was not statistically significant for this telemedicine intervention.  However, when the researchers compared more (~8.08) and less-engaged treatment facilities (0.36), a significant decline in the hospitalisation rate was observed at more-engaged facilities (difference = -8.40).  (for a nursing home that would have had 180 hospitalisations per year without the use of the telemedicine service, $p < 0.05$ )  A NH that typically had 180 hospitalisations per year and that was more engaged with telemedicine would have a reduction of about 15.1 resident hospitalisations each year	Fair	Data to track long stay or short stay residents missing.
Joseph et al., 2020, USA	Residents from 6 urban SNF*	To determine whether a SNF* based telemedicine consultation service staffed by Emergency Physicians (EP*) will reduce hospital admissions, compared to residents taken directly to ED	RCT	4606 residents 2311 intervention 2295 control.	Using electronic health records data about telemedicine, ambulance transfers, odds ratio of hospital admissions.	Only 27% ( $n = 624$ ) of the residents from intervention group SNF were transported to the ED, compared to 71% ( $n = 1629$ ) of the control (OR = 0.15 [95% CI, 0.13-0.17], $p < .001$ )	Fair.	Seasonality was a potential confounder
Cluster randomised stepped wedge trial								
Kane-Gill et al., 2021, USA	4 x NHs (2 urban, 2 suburban)	To determine the impact of pharmacist-led telemedicine services on reducing adverse drug reaction (ADE*)	Cluster randomised stepped wedge trial.	984 ED admissions reviewed	Incidence of high-risk medication, alert-specific ADEs and all-cause hospitalisation including 30-day readmission rates	The intervention group had a 92% lower incidence of alert-specific ADEs than usual care (9 vs 31; 0.14 vs 0.61/1000-resident-days; adjusted incident rate ratio = 0.08 (95% confidence interval (CI) = 0.01-0.40); $P = 0.002$ )	Good	Even though ADE categories were exhaustive miscategorised cases occurred

TABLE 1 (Continued)

Authors date country	Context	Aim	Study design	Sample	Data collection methods and analysis	Outcomes/findings	MMAT score	Limitations
Stern et al., 2014, Canada	12 eligible LTC* facilities	To determine the cost effectiveness of enhanced multidisciplinary teams via telemedicine for the treatment of pressure ulcers	Cluster randomised stepped wedge trial	12 LTCs were randomly allocated a start date to link LTC residents to a hospital-based multidisciplinary wound care team via phone, email or telehealth	Outcomes for 137 residents with pressure ulcers reviewed In-depth interviews Economic evaluation	Primary outcome rate in reduction of pressure ulcers and secondary outcome was ED visits, wound healing times and hospitalisations. No statistically significant differences were found between control and intervention periods on any of the primary or secondary outcomes	Good.	Hard to embed the intervention due to frequent staff turnover and insufficient managerial attention
Pre-post								
Hullick et al., 2022, Australia	RACFs in a metropolitan setting	To determine whether adding video telehealth consultation to established ACE (Aged care emergency outreach) program further reduces ED visits and hospital admissions	Quantitative non-randomised pre-post study. 14 months of pre-data compared with 14 months of post-data	5 intervention RACFs were compared with 8 control RACFs	Patient clinical and demographic characteristics, hospital admission and ED visits, admission status, admission diagnosis, data relating to ED visits	There were no significant differences in hospital admission or ED visits after the introduction of video-telehealth; adjusted incident rate ratios (IRR) were 0.98 (95% CI 0.55 to 1.77) and 0.89 (95% CI 0.53 to 1.47) respectively.	Good	Investigating the impact of a single intervention as part of a larger multicomponent intervention is difficult and may require different methodologies for evaluation
Mixed methods								
Hui & Woo, 2002, Hong Kong	1x 200-bed NH with telemedicine	To determine the feasibility, acceptability and cost-effectiveness of telemedicine provided geriatric services to residents of nursing homes	Mixed methods	1001 teleconsultations were made and with 876 survey participants including Geriatricians, Psycho-geriatricians, dermatologists, Nurses, Physiotherapists, Occupational therapists, podiatrists	Survey and cost analysis	96% residents favoured the service, and they felt comfortable with this mode of consultation and its convenience. Lower operating costs than for conventional services. Shorter wait times for referrals. Increase of confidence with nursing staff in caring for residents	Fair	Physical examination limitations

(Continues)

TABLE 1 (Continued)

Authors date country	Context	Aim	Study design	Sample	Data collection methods and analysis	Outcomes/findings	MMAT score	Limitations
Laflamme et al., 2005, USA.	Nursing home residents (NHR) urban	To pilot and assess the role of videoconferencing in clinicians' medical decision-making and their interactions with nursing home residents (NHRs).	Mixed methods study. Paired virtual and face-to-face (FTF) bedside examinations with the FTF examination immediately following the videoconference—by the same clinician	NHRs (n = 35) and clinicians (n = 3) receiving or providing routine care between 2002 and 2003.	Clinician–NHR interactions were assessed using coding review of videos with a 31-item instrument. Clinician rating of videoconference. Clinician orders categorised and counted.	For 71% of the encounters, clinicians stated that videoconferencing facilitated their assessment. Difficulties included sound quality (19%) and participants' familiarity with videoconferencing (7%). Although NHRs were alert in 50% of encounters, 62% of alert NHRs did not indicate understanding of the recommended treatment	Good	Small sample size. May not be representative of other practitioners in similar settings. Randomisation would have limited the sample size available in each group
Piau et al., 2018, France	10 × LTC	To assess the LTC staff perception of telemedicine	Descriptive	Numbers not provided for staff. Included in the study were nurses, psychologists, physicians, GP	Pre and post intervention telehealth semi-structured interviews with LTC staff. Questionnaires and demographic information of residents	Staff had positive perceptions of telemedicine. Strengths, weaknesses, threats (SWOT) analysis reported that potential threats became weakness, there was a fear of dehumanising medicine. 180 telemedicine sessions over 2 years with LTC staff	Good	LTC facility staff reported that it was difficult to engage with GPs
Salles et al., 2017, France	39 × NHs	To describe 1. The implementation of the interactive telemedicine in NHs. 2. The geriatric assessment performed during telemedicine consultation	Mixed method descriptive study	Audit of 500 telemedicine consults relating to 304 residents. Survey of NH participants numbers not reported	Data audit; demographics, including mean age, ADL* and MMSE* score rate, characteristics of telemedicine calls. Satisfaction survey of NH team	Avoided transfer to hospital in 378 (75.6%) cases [specialised consultations (n = 264, 52.8%); programmed hospitalisations (day hospital and hospitalisation, n = 110, 22.0%), and emergency admission (n = 4, 0.8%)]. Inappropriate prescriptions were corrected in 351 cases (70.2%). The NH teams reported 92% satisfaction with the intervention	Fair	No tools were used to quantify NH staff improvement. Results concerning skills improvement of the NH staff were based on an impression and needed to be explored further
Weiner et al., 2001, USA	240 bed urban nursing home	To explore the use and efficacy of rapid video conferencing of acute medical problems in the nursing home residents	Mixed methods	27 physicians and 187/369 residents randomised to have video calls, only 50% could complete the questionnaire, due to cognitive deficit	Physician rating score and a Patient Questionnaire	15/27 physician ratings of successful video recordings, with 54% satisfaction with video communication, the medical decision was easier 83%, with 87% video calls attended from home totalling 394 calls	Poor	

TABLE 1 (Continued)

Authors date country	Context	Aim	Study design	Sample	Data collection methods and analysis	Outcomes/findings	MMAT score	Limitations
Descriptive								
Corcoran et al., 2003, Hong Kong	200-bed home for the elderly	To investigate the acceptability of using telemedicine in the diagnosis of foot disorders	Descriptive	49 residents surveyed, 1 = podiatrist	Survey	Podiatrist found in almost 80% of cases telemedicine to be acceptable; 87% of residents preferred teleconsultations as opposed to being transported to the hospital, with 99 podiatry teleconsultations	Good	Only one podiatrist available to participate in the study
Driessen, 2016, USA	907 nursing home (NH) provider physicians (present at a conference)	To determine the perceptions of the potential effectiveness of telemedicine in RACF-resident assessments	Descriptive cross-sectional	907 were invited and 435 surveys completed by providers, physicians, a 49.5% response rate	Survey	Outcome—Among NH providers, there is a high degree of confidence in the potential for a telemedicine solution impacting upon potential avoidable hospitalisations in NHs; did not feel as though telemedicine would reduce resident care effectiveness, poorly utilised telemedicine service in NH	Good	Self-selected study sample, small sample size, not generalisable because it is a purposive sample
Gray et al., 2012, Australia	LTC 441 bed	To determine the nature and volume of telehealth services that might be provided to a LTC	Descriptive	402 residents (132 low care, 254 high-care, 16 special care)	Data analysis, demographics, consult specialty, location, reason for consult, transport method to hospital	146 medical consultations out of a total of 744 led to an emergency or unplanned hospital admission. The 598 (18%) consultations (excluding emergency hospital visits and GP consultations) related to 23 medical specialities	Good	External consultations were not included so numbers may be underestimated
Harris et al., 2021, USA	48 residents of a post-acute/LTC	To determine whether collaboratively utilised telehealth centred strategies can improve residents' outcomes in a pandemic	Descriptive	13 residents treated with the use of telehealth	Data collected; demographics hospitalisation rates, reason for telehealth consult, outcomes, deaths, data analysis = descriptive statistics/frequencies	Telehealth = A handheld multifunction examination platform that integrates videoconferencing with a stethoscope, otoscope and an oral camera along with Bluetooth-enabled vital sign monitoring. 1) rapid identification of residents who required escalation of care, (2) standardisation of care monitoring for residents who remain in the facility (3) care coordination to facilitate. Bidirectional transfers between the facility and the hospital, (4) clarification of goals of care for palliation rather than acute care transfer, and (5) daily facility needs assessment	Fair	

(Continues)



TABLE 1 (Continued)

Authors date country	Context	Aim	Study design	Sample	Data collection methods and analysis	Outcomes/findings	MMAT score	Limitations
Low et al., 2020, Singapore	8 x NHs = 1600 beds, 1x general hospital, 1x geriatric medical department	To determine the clinical profile of teleconsultations conducted between an acute geriatric medical department and NHs	Prospective Descriptive	1673 teleconsultations 850 unique residents between 2010 and 2017	Resident profiles, Demographics, presenting diagnosis, management and process provided by the teleconsultation	The 4 most common chronic patient conditions seen via teleconsultations were hypertension (57.2%, $n = 957$ ), dementia (40.4%, $n = 676$ ), diabetes (38.7%, $n = 647$ ) and hyperlipidaemia (38.2%, $n = 639$ ). Within a month after the consultation, 83.6%, $n = 1399$ of the consultations had the residents remaining in the NH for continuing care, whereas 3.4% $n = 57$ passed away in the NH	Good	The outcome measures and quality indicators were self-reported by the NHs
Ohligs et al., 2020, Germany	1 NH, and a General practitioner (GP)	To describe the holistic tele-medical system for a NH which facilitates the connection to a GP and avoids unnecessary hospitalisation. To determine acceptability of the model	Descriptive	56 routine and emergency teleconsultations	Structured Interviews with; GPs, a subset of residents, nurses and nursing management	Model helpful and even necessary for careful and reliable decision-making by the GP; show high acceptance in retirement homes. Involved residents, nurses and the general practitioner itemise various specific benefits including economic, personal and altruistic issues	Fair	No economic consequence of how telemedicine could save the health dollar
Pallawala & Lun, 2001, Singapore	2 x elderly homes	To determine the acceptability of implementing telegeriatric medical service with the use of technology to remote sites where the elderly homes are based	Descriptive	Not reported	Interviews with nursing staff and residents around useability and resident management	Nursing staff feel that there are reduced the transfers (no data provided), significantly improved management of residents, increased confidence in an event of emergency. Residents preferred teleconsultation as transfer leads to many physical problems and ailments, confident, perceived the system as a valuable resource that offered great potential	Poor	Numbers of survey participants not reported in study
Prandi et al., 2020, Italy	1 x NH residents	To determine risks, benefits, effectiveness, efficiency and future adoptions of telemedicine to address the management of malnourished residents. Using eViSuS (VV*) a telecare remote video-visit system	Descriptive	10 residents	Survey of residents/ caregivers from NH who were visited through VV	Primary outcome was if resident satisfaction was achieved, and users would employ VV again. 100% felt comfortable with telehealth doctor's medical skill, 90% fine with being on camera, 80% felt that were private. VV was as good as face-to-face visit (agreement 70%, neutral 30%) and it was easy for residents to state their concerns during VV (agreement 80%, neutral 20%)	Poor	Small number of completed surveys and the caregivers were not always present. Small study

TABLE 1 (Continued)

Authors date country	Context	Aim	Study design	Sample	Data collection methods and analysis	Outcomes/findings	MMAT score	Limitations
Rabinowitz et al., 2010, USA	NH residents/family and RACF staff	To describe the development and implementation of a nursing home telepsychiatry consultation service and the benefits associated with its use	Descriptive	106 nursing home residents; 278 telepsychiatry encounters	Cost and time savings analysis compared to usual care. Encounter and patient, NH, charge, provider travel costs, characteristics	The telepsychiatry approach had a cost savings of 843.5 hours of travel time saved, decrease in 26.4 workdays. For the treatment of 106 residents	Fair	Not generalisable, with only a single hospital experience
Tynan et al., 2018, Australia	4 x RACFs, 1 regional, 3 rural	To describe the development and implementation of an oral health integrated telehealth model of care and outline the lessons learnt	Descriptive study using ethno-methodology approach	33/116 residents required teledentistry	Pre- and post-chart audits—number of appointments avoided at a facility, cost estimates, field notes about decision-making process	Pre-implementation of telehealth; 53% of residents at participating RACFs had an oral healthcare plan Post-implementation; increase to 96%. <i>N</i> = 116, tele dentistry 33 (28%), required appointments at a facility 19 (16%), avoiding facility presentation 97 (84%)	Fair	Obtaining consent from families for oral health review by the oral health team for eligible residents was difficult
Wakefield et al., 2004	Two Veterans Affairs Medical Centres (VAMC) and a state Long-term care (LTC) centre	To assess provider and resident satisfaction with and outcomes of specialist physician consultations provided via interactive video to residents of a long-term care (LTC) centre	Quantitative descriptive using a cross-sectional Survey	Physicians ( <i>n</i> = 12) at the VAMC. Nurses ( <i>n</i> = 30) and residents ( <i>n</i> = 62) at the LTC centre	Satisfaction ratings and record review to determine changes in treatment plan and follow-up care	<i>N</i> = 76 individual consultations in six clinics. Treatment plan with the resident remaining at the LTC setting ( <i>n</i> = 29, 38%) or no change in treatment ( <i>n</i> = 26, 34%). Physicians' ratings of the interactive video as good to excellent for usefulness in developing a diagnosis = 78%, usefulness in developing a treatment plan = 87%, for quality of transmission = 79%, and satisfaction with the consult format = 86%. Overall, 72% of residents were satisfied with the consult format, and 92% felt that it was easier to obtain medical care via telemedicine. Nurses felt it was good use of their time and skills (100%)	Good	All participants were male so the sample is not representative of the target population which includes females, some residents were unable to participate due to cognitive impairment which excluded them from the study
Retrospective cohort studies								
Hex et al., 2015, UK	27 care homes with telemedicine 968 beds 21 care homes without telemedicine as a control 557 beds	To determine acute hospital activity before and after installation of telemedicine in care homes	Non-randomised retrospective comparison study	942 residents from telemedicine group, 502 residents from the non-telemedicine group	Data audit; hospital admissions and ED visits were gathered for care home residents who had used telemedicine a costing for each ED attendance was £114.56	With telemedicine, emergency admissions declined by more than 1700 compared to the same time period prior. Cost analysis return on investment in telehealth would result in 39% cost saving re LoS* reduction in the acute hospital, a cost reduction of £5.23 million compared to the same period before	Fair	The availability and the quality of the community after hours services

(Continues)

TABLE 1 (Continued)

Authors date country	Context	Aim	Study design	Sample	Data collection methods and analysis	Outcomes/findings	MMAT score	Limitations
Roques & Hovanec, 2001, USA	1x 60 bed Assisted living facility ("ALF")/ a 66-bed licensed SNF/social workers	To determine whether a telemedicine program helped link residents with psychiatric symptoms in the ALF and SNF to the clinical teams at the major hospital	Cohort study, pre-post implementation of telehealth	126 resident transfers	Audit of number of residents transferred to hospital and length of stay 1 year after implementation	Comparing 1998 to 1999, there were 'Fairly dramatic' changes in the number of hospitalisations 50% decline (n = 67) and a total 100 fewer days spent in hospital	Poor	Set up of equipment could be seen as a prohibitive expense
Chess et al., 2018, USA	Skilled nursing facility (SNF)	To determine the clinical and financial impacts of using telehealth with an after-hours physician	Cohort study	259 residents out of 313 bed (SNF), convenience sample	Audit of resident conditions/diagnosis, financial impact data-hospital avoidance, ambulance transfers, LoS	Cost savings; total number of telehealth calls were 313 with 259 (83%) residents were treated on site, including 91 who avoided hospitalisations, 54 were transferred to the hospital. Estimated cost savings to Medicaid and other payers exceeded \$1.55 million; improving nurse assessment skills; comfort and confidence to families; and resident integration within the clinical team	Good	Only in one facility in one context, not generalisable
Grounded theory design								
Stephens et al., 2020, USA	1x NH	To explore the care givers experiences/challenges with NH to ED transfers and whether telehealth might be able to mitigate some of those concerns	Grounded theory	41 participants comprising of; families, NH nurses, primary care providers, ED physicians, ED nurses, NH administrators	Focus groups	ED were perceived as having a lack of trust in NH care and capabilities. Four main factors: questioning the quality of NH nurses' assessments, perceptions that physicians were absent from the NH; misunderstandings of the capabilities of NHs and EDs; and perceptions. That responses to medical needs were inadequate	Good	There was an inability to engage NH residents in the focus groups, missing the resident's perspective of the intervention

TABLE 1 (Continued)

Authors date country	Context	Aim	Study design	Sample	Data collection methods and analysis	Outcomes/findings	MMAT score	Limitations
Case study								
Bidmead et al., 2015, UK	5 Nursing homes (NH) and their speech and language therapists (SLT*)	To build a case for adoption of the 'teleswallowing' assessment model, explore barriers and enablers	Case study; action research methodology	SLTs = 6, Managers = 5, Nurses = 3, Residents = 17	2 focus groups (SLTs), Interviews (7 telephone, 5 Face-to-face)	Upskilled staff in nursing homes; quicker assessments/shorter waiting times; avoidance of serious problems and hospital admission; less distress for residents and improved quality of life; benefits to residents and nursing homes from not attending hospital outpatient appointments; prestige for participating nursing homes; and freeing up SLTs' time	Good	Technical problems, staffing pressures, in sufficiently experienced SLTs. Improvements wanted; iPad are heavy, using a camera would be better, dedicated IT support, protocol, and criteria development
Pilot study/Proof of concept / feasibility								
Archbald-Pannone et al., 2020, USA	Long-term care (LTC) facilities	To support optimal care of residents during COVID-19 with the use of telemedicine and strengthening all communication links	Pilot study	12 LTC contacted to use telemedicine only 5 participated	Collected information on the number of telemedicine calls	Strong evidence does not yet exist regarding efficacy or effectiveness of telemedicine in LTC facilities found in this project.  The mortality rates from the LTC COVID-19 outbreaks were 12% and 19% lower in participating LTCs compared to the published mortality rate of 28% (presumed of the general LTC population, not clear)	Poor	Numbers were not clear from data, only % provided
Catic et al., 2014, USA	LTC and large academic hospital with strong geriatric medicine program	To design, implement and assess the pilot phase of an innovative, remote case-based video consultation program called Extension for Community Healthcare. Outcomes (ECHO-AGE). A multidisciplinary group providing assessments via videoconferencing platforms	Pilot study	11 LTC 47 participants used ECHO-age; data analysed for 44 participants only	Audit of outcome and hospitalisations	ECHO-AGE recommendations followed for 39 out of 44 residents in the long-term care sites reported that 74% (n = 29) of the residents clinically improved ( $p < .03$ 2-sided Fisher exact test). In addition, hospitalisation was less common among 29% (n = 11) of residents in whom the recommendations were followed	Poor	Agitation was not defined well enough. Low numbers

(Continues)

TABLE 1 (Continued)

Authors date country	Context	Aim	Study design	Sample	Data collection methods and analysis	Outcomes/findings	MMAT score	Limitations
Chan et al., 2001, Hong Kong	1 Nursing home (NH) with 198 residents over 12 months	The feasibility and acceptability of using tele-nursing in a NH Intervention—using telemedicine to assess residents in 7 key health areas	Descriptive	Surveys, 47 residents, 18 NH staff, 9 Geriatric outreach team members	Survey of useability and acceptability of telemedicine. Hospital transfer data	Potentially economically attractive with the reduction in travel and nurse escorting residents to hospital. 89% ( $n = 176$ ) assessments could be done as telemedicine and treated insitu where 11% ( $n = 23$ ) were sent to ED. Survey data 96% residents considered teleconferencing acceptability was good. Developed strong partnerships between NH and hospital, whilst increasing staff confidence	Fair	One facility only. Impractical equipment size of telemedicine workstation. Dependant on the cooperation of NH staff
Hofmeyer et al., 2016, USA	34 LTCs	To determine whether the use of telemedicine to assess residents from rural LTCs will reduce potentially avoidable hospitalisations (PAH*) to hospital	Descriptive proof of concept	23 eLTC* calls per implemented LTC per year, over 3 years	Data analysis; number of eLTC consults, transfers to ED, number of potentially avoidable hospitalisations	69% ( $n = 511$ ) did not require a transfer to ED. Prior to the implementation of eLTC they would most likely have needed transfer to ED	Fair	Staff of the eLTC felt that they were contacted too late to be able to resolve issues when called by the LTC
Hui et al., 2001, Hong Kong	1 x 200 bed NH	To assess whether providing telegeriatric services to NH residents result in an increase in productivity and saving	Mixed methods, pilot study	876 survey participants, 356 patient episodes of care Geriatric assessment team, specialists, NH staff and residents	Survey, cost analysis	Deemed a cheaper alternative. Attitudes of nursing staff was generally positive, however, half felt that their workload increased after telemedicine was installed, 30% of residents could not complete the survey due to dementia diagnosis ED attendance reduced from 328 to 299 visits per annum. There were 1001 telemedicine consults	Fair	

Abbreviations: ACE, aged care emergency; ADE, adverse drug reaction; ADL, activities of daily living; ALF, assisted living facility; ED, emergency department; EP, emergency physicians; FTF, face to face; eLTC, electronic long-term care; GP, general practitioner; LoS, length of stay; LTC, long-term care; NH, nursing home; NHR, nursing home residents; MMSE, mini mental state examination; PAH, preventable hospital admissions; RACF, residential aged care facility; SLT, speech language therapist; SNF, skilled nursing facility; VAMC Veterans Affairs Medical Centres; VV eViSuS telecare remote video-visit system.



**Table 2.2**

*MMAT Study Rating*

TABLE 2 MMAT study rating

	MMAT score range	Number	Studies
Good	5–7	13	Bidmead et al., 2015; Chess et al., 2018; Corcoran et al., 2003; Driessen et al., 2016; Gray et al., 2012; Hullick et al., 2022; Kane-Gill et al., 2021; Laflamme et al., 2005; Low et al., 2020; Piau et al., 2018; Stephens et al., 2020; Stern et al., 2014; Wakefield et al., 2004.
Fair	4–5	12	Chan et al., 2001; Grabowski & O'Malley, 2014; Harris et al., 2021; Hex et al., 2015; Hofmeyer et al., 2016; Hui et al., 2001; Hui & Woo, 2002; Hullick et al., 2022; Joseph et al., 2020; Ohligs et al., 2020; Rabinowitz et al., 2010; Salles et al., 2017; Tynan et al., 2018
Poor	0–4	6	Archbald-Pannone et al., 2020; Catic et al., 2017; Pallawala & Lun, 2001; Prandi et al., 2020; Roques & Hovanec, 2002; Weiner et al., 2001

et al., 2017; Driessen et al., 2016; Pallawala & Lun, 2001), podiatrists (Corcoran et al., 2003), psychiatrists (Rabinowitz et al., 2010), social workers (Roques & Hovanec, 2002), dentists (Tynan et al., 2018), speech pathologists (Bidmead et al., 2015) and hospital departments and RACFs (Archbald-Pannone et al., 2020; Chan et al., 2001; Chess et al., 2018; Grabowski & O'Malley, 2014; Gray et al., 2012; Harris et al., 2021; Hex et al., 2015; Hofmeyer et al., 2016; Hui et al., 2001; Hui & Woo, 2002; Hullick et al., 2022; Joseph et al., 2020; Laflamme et al., 2005; Low et al., 2020; Piau et al., 2018; Prandi et al., 2020; Salles et al., 2017; Stephens et al., 2019; Stern et al., 2014).

**Aim**, the studies aimed to determine if telehealth; lowered rates of hospitalisations, reduced adverse events, was cost effective, was an acceptable service, improved health outcomes, linked people to appropriate services, was an effective and efficient intervention, and strengthened communication links. Further to this, studies also aimed to understand; clinical staff perception of telehealth, what it was being used for, the benefits, barriers and enablers, how much activity was going on, and the care givers' experiences.

**Study Design**, two studies were cluster randomised stepped wedge trials (Kane-Gill et al., 2021; Stern et al., 2014), and two were randomised controlled trials (Grabowski & O'Malley, 2014; Joseph et al., 2020) a pre/post-study (Hullick et al., 2022). Four studies used mixed methods (Hui & Woo, 2002; Laflamme et al., 2005; Piau et al., 2018; Salles et al., 2017), and 39% of studies were descriptive ( $n = 12$ ) (Corcoran et al., 2003; Driessen et al., 2016; Gray et al., 2012; Harris et al., 2021; Low et al., 2020; Ohligs et al., 2020; Pallawala & Lun, 2001; Prandi et al., 2020; Rabinowitz et al., 2010; Tynan et al., 2018; Wakefield et al., 2004; Weiner et al., 2001). Three studies were retrospective cohort studies (Chess et al., 2018; Hex et al., 2015; Roques & Hovanec, 2002), one used a grounded theory study design (Stephens et al., 2020) and one a case study (Bidmead et al., 2015). Five were pilot studies (Archbald-Pannone et al., 2020; Catic et al., 2017; Hui et al., 2001), including a proof-of-concept study (Hofmeyer et al., 2016).

**Sample**, the sample sizes varied from describing numbers of RACF residents ( $n = 4606$ ) (Joseph et al., 2020) or number of RACFs ( $n = 11$ ) (Grabowski & O'Malley, 2014) or admission numbers to ED from RACFs (e.g.  $n = 984$ ) (Kane-Gill et al., 2021), or number of teleconsultations made ( $n = 1001$ ) (Hui & Woo, 2002).

**Data collection methods and analysis**, a range of data collection methods were used, including surveys, interviews, medical

record audits and cost analyses. A range of statistical and qualitative data analysis techniques were used according to the type of data collected.

**Outcomes/Findings**, RACFs that were more engaged with telehealth had significant reductions in hospitalisations per year (Grabowski & O'Malley, 2014; Hofmeyer et al., 2016; Salles et al., 2014), less adverse events (Kane-Gill et al., 2021), lower operating costs and increased staff satisfaction (Hui & Woo, 2002; Piau et al., 2018), found it acceptable (Corcoran et al., 2003; Wakefield et al., 2004), improved coordination of care and improved outcomes (Harris et al., 2020; Laflamme et al., 2005), high acceptance by GPs and nurses (Ohligs et al., 2020) and increased nurse confidence (Pallawala & Lun, 2001), acceptable for the residents (Prandi et al., 2020), significant cost-savings and operating costs (Chan et al., 2001; Chess et al., 2018; Hex et al., 2015; Rabinowitz et al., 2010). However, some studies found that telehealth did not result in a significant reduction in ED visits (Hullick et al., 2022; Stern et al., 2014), was poorly utilised with no perceived confidence in its ability to influence hospital avoidance (Driessen et al., 2016), and that there were misunderstandings surrounding the telehealth and clinical abilities of the staff in the RACFs (Stephens et al., 2019).

**MMAT score**, Critical appraisal using the MMAT (Hong et al., 2018) resulted in 13 of the studies receiving a rating of good, 12 were rated as fair, and 6 were rated as poor due to low methodological quality. The data are presented in Table 2.

**Limitations**, of some studies included that seasonality was a confounder for hospital presentations, poor coding, and data collection issues, difficult to embed the intervention due to staff turnover, physical examination limitations, difficulties engaging with GPs, small sample sizes meaning the study findings were not generalisable, and some studies made claims of reductions in events without providing any numerical or statistical data.

#### 4.4 | Findings

For the qualitative analysis, two authors conducted the initial categorisation of the key components independently, using NVivo (QSR, 2020) and manually, then presenting the results to the team for discussion. A framework was established through team discussions upon reviewing the preliminary results as a guide, as recommended by JBI. Categories were then identified, coded and charted

using significant text from the papers, using the framework as a guide. The qualitative evidence and quantitative evidence were brought together in an overarching synthesis and in a final iteration and consensus by all authors.

Analysis of the 31 studies, identified five common findings: 1. Older person (resident) hospital avoidance, 2. Older person (resident) experience, 3. Nurses' improved assessment skills, 4. Cost savings, and 5. Barriers and enablers. The five findings are presented in the following section.

#### 4.5 | Older person (resident) hospital avoidance

Most of the papers identified increases in hospital avoidance as an outcome measure. However, only two studies used robust research designs with low risk of bias, including an RCT (Joseph et al., 2020) and a Stepped wedge RCT (Stern et al., 2014). These two trials reported conflicting results. The Joseph et al. (2020) RCT found that the telehealth groups were less likely to have their care escalated to a hospital than the control groups that has no telehealth service 27% vs 71% (OR 0.15, CI 0.13-0.17); whereas the Stern et al. (2014) Stepped Wedge RCT did not find a significant difference in hospitalisation rate and it was estimated to be 1.2 (CI 0.62, 2.36) times more ( $p = .59$ ) with the use of telehealth.

The Hofmeyer et al. (2016) pilot study found that 69% of 511 telehealth consults could be managed without an ED transfer. In a descriptive study by Low et al., (2020), keeping the resident in the RACF after the telehealth interaction was perceived to be a successful outcome;

'Within a month after the consultation, 83.6% of 1399 consultations had the patients (sic) remaining in the nursing home'

(Low et al., 2020, p. 1075).

In other studies, a small pilot study found that hospitalisation was less common in 29% ( $n = 11$ ) of residents in whom the telehealth recommendations were followed (Catic et al., 2017), and in a mixed method study, 75.6% ( $n = 378$ ) avoided transfer to hospital (Salles et al., 2017). In a case study examining identification of residents with urgent podiatry problems (Corcoran et al., 2003), there was earlier identification and avoidance of serious problems with the use of telehealth that would otherwise have necessitated a hospital admission (Bidmead et al., 2015). In a descriptive study that measured just the physicians' impressions, it was reported that they had confidence that telehealth would impact on hospital avoidance (Driessen et al., 2016; Laflamme et al., 2005). This finding was also confirmed in a retrospective cohort study by Roques and Hovanec (2002, p. 37). The authors claimed that

'During the first year of operation of the Telemedicine program, there were fairly dramatic changes in the number of hospitalizations (1997  $n=21$ , 1998

$n=11$ ) and the total number of days spent in the hospital (1997  $n=367$ , 1998  $n=258$ )'

(Roques & Hovanec, 2002, p. 37).

#### 4.6 | Older persons' (resident) experience

Seven of the included studies reported on the residents' experience of telehealth. Pilot studies (Chan et al., 2001; Hui et al., 2001) considered the resident experience to be positive and acceptable. Resident satisfaction was measured through surveys and interviews, all reporting a positive experience in terms of usability and acceptability of telehealth (Chan et al., 2001). A case study interviewed residents about telehealth. Residents indicated that they felt less distress and increased comfort and they felt it gave them a better quality of life with the use of telehealth (Bidmead et al., 2015). Importantly, a cohort study found that residents also felt more included in decision-making with telehealth (Chess et al., 2018). Further, a descriptive study utilising a survey found that residents regarded communication via telehealth made it easy to state their concerns (Prandi et al., 2020).

Important insights were provided in a descriptive study (Corcoran et al., 2003), that reported a preference for telehealth over person-to-person appointments;

'87% ( $n=40/46$ ) preferred teleconsultations to being transported to the hospital clinic for their foot care'

(Corcoran et al., 2003, p. 148).

Two studies, a case study, and a pilot study, commented on how hard it was to recruit enough participants for surveys due to the frequency of a dementia diagnosis among residents (Bidmead et al., 2015; Hui et al., 2001). Hui et al., (2001) reported that 70% of residents were unable to provide informed consent to participate in a survey due to cognitive impairment (Hui et al., 2001). This was a common reason given for low numbers of residents' perspectives included in many studies.

#### 4.7 | Nurses' improved assessment skills

Telehealth offered RACF staff the opportunity for a second opinion and supported teaching/learning when a more skilled colleague or clinician was involved in the consultation. A grounded theory study by Stephens et al. (2020) explored the effect of telehealth on the assessment skills and experience of the RACF nurse with the use of telehealth.

'The staff of the residential home found that it increased their knowledge and ability to care for the client. Initially, some were anxious about telemedicine, but after a little experience they became confident and adept at using the equipment'.

(Corcoran et al., 2003, p. 148).

This in turn, built trust with the residents because their care was being managed in collaboration with many clinicians (Stephens et al., 2020). Other studies have described telehealth in RACFs as improving staff confidence due to 'Improving nurse assessment skills' (Chess et al., 2018, p. 386; Hui & Woo, 2002; Pallawala & Lun, 2001), increasing professional satisfaction (Catic et al., 2017) and assisting in the avoidance of adverse events (Bidmead et al., 2015).

Whilst seven studies reported on the improvement of assessment skills for staff, only one study questioned whether these skills would be sufficient to assist the recipient on the end of the telehealth call. There were concerns from speech language therapists (SLT) regarding accountability associated with making the correct diagnosis for the resident via telehealth (Bidmead et al., 2015). One SLT commented

'would we get enough information from the person at the other end of the link to allow us to give safe recommendations?'

(Bidmead et al., 2015, p. 6).

#### 4.8 | Cost savings

The use of telehealth in cost analyses focused on the reduced travel of the resident to ED and the cost of the specialist travel to the resident (Corcoran et al., 2003; Rabinowitz et al., 2010). In some cases, the additional cost of sending an escort with the resident to ED was saved (Gray et al., 2012), along with the cost of the ambulance transfer. Reported cost savings varied considerably from hundreds of dollars to some resulting in million-dollar savings (Chess et al., 2018; Grabowski & O'Malley, 2014; Hofmeyer et al., 2016), depending on the RACF and the study size. A study by Chess et al. (2018, p. 386) stated there are 'significant healthcare cost savings'. This study found in one year, 91 residents avoided hospital admission, ambulance transfers and Medicaid-covered costs, with a saving of US\$1.6 million with the inclusion of a telehealth enabled service. Two studies (Chan et al., 2001; Grabowski & O'Malley, 2014) reported that telehealth was economically attractive, with a study by Hex et al. (2015) reporting a 39% return on investment in the reduction of length of stay in hospital. In a stepped wedge trial, telehealth made an indirect care cost reduction in wound care of US\$650 per resident compared to usual care (Stern et al., 2014).

#### 4.9 | Barriers and enablers

##### 4.9.1 | Enablers

All studies found telehealth to be very acceptable. Studies that included older people (residents), podiatrists, nurses, occupational therapists, psychiatrists, dentists, GPs and geriatricians all found telehealth to be of benefit for several reasons. Reasons included

the development of a good working relationship between the GP, nurse and the resident (Ohlgs et al., 2020); the GP was able to pass from one resident to the next in almost no time; allowing an efficient use of resources, and telehealth was understood to be an efficient triage mechanism that identified issues in timely fashion (Corcoran et al., 2003; Harris et al., 2021). Podiatrists also found that telehealth allowed earlier intervention for residents and nursing staff who increased their knowledge and ability to care for the resident using visual telehealth (Corcoran et al., 2003).

Telehealth allowed integration within the clinical team and the primary attending physician (Chess et al., 2018); a great benefit to the clinical assessment process. This benefit was realised in that the physician can see and examine the resident within minutes and can initiate treatment or send the resident to hospital in a timelier way (Chess et al., 2018). An efficiency also noted by speech therapists and podiatrists, telehealth allowed them to see more residents (Bidmead et al., 2015; Corcoran et al., 2003). A podiatrist study reported increased productivity;

'Three times the number of people could be screened via teleconference in the same amount of time as required for an on-site consultation'.

(Corcoran et al., 2003, p. 148).

In addition, specialists reported that the use of telehealth helped to reduce waitlist assessments for residents (Corcoran et al., 2003; Hui & Woo, 2002).

##### 4.9.2 | Barriers

Two studies indicated that staff felt their workload had increased with the introduction of telehealth (Bidmead et al., 2015; Hui et al., 2001). Along with the perception of increased workload, it was hard to embed the intervention due to staffing issues such as insufficiently experienced staff (Bidmead et al., 2015). The staffing of caregivers in RACFs was hampered by frequent staff turnover and insufficient managerial support (Stern et al., 2014). In addition to the poor staffing, there were issues around provider engagement with telehealth as there was not always a guarantee that RACF staff would use telehealth when offered it. This poor uptake of telehealth was reported by Grabowski and O'Malley (2014) in two out of the six RACFs in their study. Furthermore, Hofmeyer et al. (2016) emphasised that if the physician is contacted about a deteriorating resident by the RACF staff too late, the impact of telehealth is diminished.

One study in France reported that there was a difficulty engaging GPs with telehealth (Piau et al., 2018). The GP is the primary health provider for residents and their involvement was not reported in many of the studies in this review. Of the 28 studies, there were only three that mentioned GP involvement specifically (Ohlgs et al., 2020; Piau et al., 2018; Salles et al., 2017) and not always



positively. One study implementing a telehealth pharmacological intervention reported that some GPs;

'refused to implement the proposed pharmacological interventions, which was very frustrating for the staff'

(Piau et al., 2018, p. 1002).

Several authors identified telehealth was not always appropriate for physical examinations (Corcoran et al., 2003; Hui et al., 2001; Piau et al., 2018) or procedures like the debridement of a wound (Hui & Woo, 2002; Piau et al., 2018) or other 'hands on' procedures (Corcoran et al., 2003, p. 148). This was clarified in the Corcoran et al. (2003) podiatry study, with authors concurring that telehealth would not always be appropriate because:

'assessment via teleconference did not include in-depth neurological or vascular assessment, because of the lack of equipment on site'.

(Corcoran et al., 2003, p. 149).

Similarly, geriatricians found it limiting to do a physical examination on new residents and nurses found it was challenging to assess resident behavioural problems (Hui & Woo, 2002). In contrast, a survey of providers revealed that telehealth would reduce avoidable hospitalisation of residents and not weaken their care management plan (Driessen et al., 2016).

## 5 | DISCUSSION

Few RCTs have been conducted that report a treatment effect associated with a telehealth intervention (Grabowski & O'Malley, 2014; Joseph et al., 2020; Kane-Gill et al., 2021; Stern et al., 2014). The stepped wedge trial by Kane-Gill et al. (2021), a pharmacist-led patient-centred telehealth project, had a 92% lower incidence of adverse drug reactions compared to usual care because of the telehealth consultation and review of medications ( $p = .002$ , 95% CI = 0.01–0.4). The Grabowski and O'Malley (2014) RCT identified that if a RACF experiencing an average of 180 hospitalisations per year engaged with telehealth, they could expect to see a statistically significant reduction of about 15.1 hospitalisations each year, compared to RACFs that were less engaged. The Stern et al. (2014) stepped wedge trial supported the finding that quality of leadership and high staff turnover in RACFs impacted the uptake of telehealth. Their qualitative data analysis revealed that the use of wound care consultations were highly feasible in hospital avoidance. The Stern et al. (2014) study estimated that mean hospitalisation rates were 1.2 times higher during the intervention due to a more thorough wound care evaluation (95% CI 0.62–2.36), although this was not statistically significant ( $p = .59$ ). In the Joseph et al. (2020), RCT-skilled nursing facilities using telehealth had significantly less ED transfer rates (27%,  $n = 637$ ) when compared to the control group (71%,

$n = 1629$ ), ( $p < .0001$ ). All trials were conducted in the United States or Canada.

The review of these studies identified the following issues. Firstly, there was an absence of detail about the actual lived experience of a telehealth consultation and the perspectives of RACF residents (Stephens et al., 2020). Corcoran et al. (2003) reported that residents were often excluded due to a diagnosis of dementia. Additionally, there was no measurement identified regarding the impact of the seasonal variation on hospital presentations. Only one study acknowledged that there may have been a seasonal confounder (Joseph et al., 2020). Finally, there was an issue in some cases around data accuracy. One study reported there was a problem capturing accurate information with the incorrect categorisation of telehealth cases (Kane-Gill et al., 2021) and missing numbers in another study (Gray et al., 2012).

No studies have examined the effectiveness of an ED outreach service plus telehealth capability in reducing ED presentations from RACFs. There is no evidence that we can locate of such a model having been trialled and no previous studies have reported the effectiveness of such an integrated approach. Studies about the use of telehealth and hospital avoidance are mainly based around increasing access to care from different types of clinicians, for example, wound care, podiatry, geriatricians (Catic et al., 2017; Driessen et al., 2016; Pallawala & Lun, 2001) and speech pathology (Bidmead et al., 2015). Furthermore, in many studies, the sample sizes were small with the sample often drawn from only one RACF, and consequently, results were not generalisable (Chess et al., 2018).

Supportive collaborations with clinical staff and RACF staff using telehealth to enhance access to teaching and learning, knowledge, and skill development, can increase the ability for staff to care for the RACF resident (Corcoran et al., 2003). Telehealth in one study has shown that these collaborations resulted in 69% of consults preventing an ED transfer (Hofmeyer et al., 2016) and hospitalisation was less common with telehealth with 122 cases (24.4%) (Salles et al., 2017).

Not only can telehealth be justified as a way for residents to avoid an unnecessary hospital admission, it has additional patient-centred benefits also. Studies identify high levels of staff satisfaction and confidence with the use of Telehealth (Chess et al., 2018; Hui & Woo, 2002; Pallawala & Lun, 2001). Studies also reported a positive experience for residents in terms of usability and acceptability of telehealth (Chan et al., 2001), feeling less distress (Bidmead et al., 2015) and having increased comfort. Another positive outcome was that the resident and families were involved in the decision-making surrounding the management of their care. Residents also felt more included in the decision-making with telehealth (Chess et al., 2018) which they felt gave them a better quality of life (Bidmead et al., 2015). In accessing telehealth, residents have an opportunity to be involved in decision-making and a choice in their own health care justifying the use in RACF care pathways.

Hospital avoidance was observed in most studies yet telehealth is not commonly embedded in all acute facilities. Telehealth is not used to its full potential and was viewed in one descriptive study to

be underutilised (Driessen et al., 2016). Grabowski and O'Malley's (2014) RCT suggested the reason for telehealth underutilisation may be the need for policy reform to incentivise the use of telehealth with financial remuneration. The cost savings from engaging with telehealth and return on investment has been mentioned in many of the studies. Telehealth is a justifiable investment for healthcare services with the appropriate and cost-effective care pathways for RACF residents.

There is a need to conduct research related to RACF residents to help prevent unnecessary hospital admissions and readmissions. Telehealth outreach models can further support RACF staff to care for residents in RACFs with the opportunity for enhanced access to teaching and learning to help prevent unnecessary hospital presentations and treat them in the RACF without exposing them to poor outcomes in acute facilities.

Most recently, the COVID-19 pandemic has been a catalyst for the increased use of and need for telehealth. The pandemic has unfortunately claimed more lives in the RACF-resident cohort than in any other age bracket (Burkett et al., 2021). Clinicians are looking for ways to facilitate assessment from a distance, whilst keeping the care recipient front and centre of their care during the pandemic. The telehealth model of care (MoC) provides an effective and viable alternative for clinicians.

## 5.1 | Limitations

Some studies did not recruit a representative study sample, and their results were potentially affected by some bias and consequently were not generalisable. We have added this statement below to the limitations as suggested. No a-priori protocol was registered or published in relation to this scoping review, which is a potential limitation of the study, since a protocol aims to limit the occurrence of reporting bias. Instead, a detailed plan for the scoping review was developed with the first author and supervisory panel of academic researchers who are co-authors. Engagement of a senior university research academic librarian/information specialist guided the search for literature aimed to ensure a sufficiently robust search was undertaken and no relevant studies were missed. Abstraction of relevant data from each paper was scrutinised by the supervisory panel as described in File S2—the use of the PRISMA-ScR (Tricco et al., 2018) enabled the authors to check whether the scoping review conformed to this reporting standard.

## 6 | CONCLUSION

This scoping review has mapped evidence that telehealth has been widely used in multiple settings. The association between the use of telehealth and improved clinical outcomes highlights its potential utility in enhancing care delivery for an older population in RACFs. Telehealth has shown that it can improve the decision-making for residents in RACFs. Even though the studies were from a variety

of different disciplines, hospital avoidance was increased. The review identified that telehealth is underutilised in RACFs. The use of telehealth in RACFs has potential for improved decisions about transferring residents and significant cost savings to hospital prior to, and during a pandemic.

## ACKNOWLEDGMENTS

Thank you to both Debbie Booth (Medical Librarian and Research and Scholarly Communication Advisor, Academic Division, University of Newcastle) and Angela Smith, Medical Librarian, John Hunter Hospital Library, Hunter New England Area Health for their thoughtful contribution to the data searches for this paper. Open access publishing facilitated by The University of Newcastle, as part of the Wiley - The University of Newcastle agreement via the Council of Australian University Librarians.

## FUNDING INFORMATION

Translational Research Grant Scheme funded project with the Ministry of Health, New South Wales, Australia (H19/53776).

## CONFLICT OF INTEREST

The authors declare no conflict of interest.

## DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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#### SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

**How to cite this article:** Sunner, C., Giles, M. T., Kable, A., & Foureur, M. (2022). Does telehealth influence the decision to transfer residents of residential aged care facilities to emergency departments? A scoping review. *International Journal of Older People Nursing*, 00, e12517. <https://doi.org/10.1111/opn.12517>

## **2.2 Summary**

In this chapter the evidence that telehealth can improve the decision-making for RACF residents is presented. At the time this scoping review was conducted, no models had utilised telehealth in an ED nurse-led setting between the ED and the RACF. The findings from this Scoping review informed the methods and approach needed to develop the study protocol. The following chapter is the study protocol methodology, methods and design, including the published PACE-IT study protocol.

## **Chapter 3: Methodology and methods**

In this chapter, study design and methods of the PACE-IT study are detailed including the study protocol published in the journal *BMC Health Services Research* in 2020. Before presenting the study protocol, several aspects of the underpinning theoretical approach to the study are guided by normalisation theory and the principles of implementation science that need to be described. This chapter begins by exploring the philosophical basis of the work, which aligns with the two major paradigms of positivism and interpretivism. Section 3.1 describes the epistemology and ontology underpinning this research which is written in the first person.

### **3.1 Epistemology and ontology**

Four elements—methods, methodology, epistemology and ontology—are present in research and are known as paradigms. A paradigm is a belief system and our way of understanding our world. Epistemology and ontology are the philosophical underpinnings of this thesis, which align with two major paradigms: positivism and interpretivism (Rehman & Alharthi, 2016).

The PACE-IT project evolved from a worldview and understanding that communication in any form is crucial for patient safety. I thought that by improving handover with the RACF nurse before bringing RACF residents to the ED, their management would likely improve, and there could be less need for an ED visit. Incorporating visual telehealth into the approach drew on existing knowledge; previous readings and information and the benefits from the pilot study, improved the accuracy of assessments and communication by including the ability to see/visualise the RACF nurses and the resident via telehealth from the ED. Conversations with other clinicians and visual telehealth experts helped to clarify this phenomenon. Experience and knowledge came from discussing the alternatives with RACF

nurses, residents and their families, and other ED clinicians. However, more detail were needed to understand if including visual telehealth in the ED and the RACF was feasible for clinicians to use. Would visual telehealth be beneficial to the RACF residents? Would visual telehealth provide data to establish that telehealth-assisted communication would be an effective care pathway?

Epistemology is ‘to know’ and to find debate in the knowledge available (Stroll & Martinich, 2023). The scoping review was the first step in gaining knowledge and how it aligned with what I already knew and how the planning of the PACE-IT project began. The gaps in knowledge were the most obvious sign that this research was needed, very little research about visual telehealth outreach from RACFs to EDs was detected. I first needed to know if this was what residents and nurses wanted. To truly understand what knowledge was needed and how this knowledge could be obtained, this necessitated discussion and planning with the research team and the participation of community members. Understanding what is knowable and worth knowing was constructed in these ways. The design of the study (a stepped wedge cluster RCT) and inclusion of quantitative data collection to establish the cause-and-effect relationship between the intervention (augmenting the ACE service with visual telehealth) and outcomes (avoiding unnecessary ED visits) sit within the positivist paradigm. Simultaneously the study design included the collection of qualitative data that was required to make sense of the intervention from the point of view of the RACF and ASET nurses. This aspect of the study sits within the interpretive paradigm. If the intervention was regarded as acceptable and usable by the nurses, then the quantitative outcome data would reflect this. One approach informed the other.

Ontology is a way to prove the existence of an object in the world; it is the verification of that which is true and that which is verifiable (Stroll & Martinich, 2023). The foundation of the PACE-IT project needed to be strong with concrete planning like the

footings of a house (Rehman & Alharthi, 2016); the footings are there, but cannot be seen. Understanding that epistemology and ontology are always co-dependent and closely related, underneath all of this are our views of the world that influence our decisions. The understanding of nursing, EDs, RACFs and residents' connection with each other and this study led to better research; it helped account for the research team's methods and why the study was conducted the way it was. Ontology provides a criterion that tethers the objects and the relationship between them.

The methodology chosen to obtain the knowledge was the next step. Data collection methods were needed to help clarify the connection between the use of telehealth and its impact on RACF-resident visits to the ED. Further, an understanding of the nurse's confidence in using the equipment and their perception of the value of using VTC was needed. There was evidence that it worked, but the team needed to translate what was known into practice locally. Implementation science provided a framework that translated the use of telehealth into normal practice, as discussed in the next section.

### **3.2 Theoretical underpinnings of PACE-IT**

The PACE-IT project was funded by a grant awarded by the NSW Ministry of Health's Translational Research Grants Scheme. The scheme intends to build research capability among health staff and accelerate evidence translation within the NSW public health system. Implementing research such as the PACE-IT study aims to reduce the gap between evidence gathering and application in the health setting. Implementation science (Bauer et al., 2015) and the NPT (Murray et al., 2010) were selected as the theoretical foundations of this research to ensure that the PACE-IT study was consistent with this way of thinking. These topics are covered in more detail in the next section.



### 3.2.1 Implementation science

The PACE-IT study sits firmly in the realm of studies that address the implementation into clinical healthcare practice of interventions that have established feasibility. The relatively new field of implementation science first emerged in the late 1990s (Bauer et al., 2015) and is defined by Allotey et al. (2008, p. 3) as ‘applied research that aims to develop the critical evidence base that informs the effective, sustained and embedded adoption of interventions by health systems and communities’.

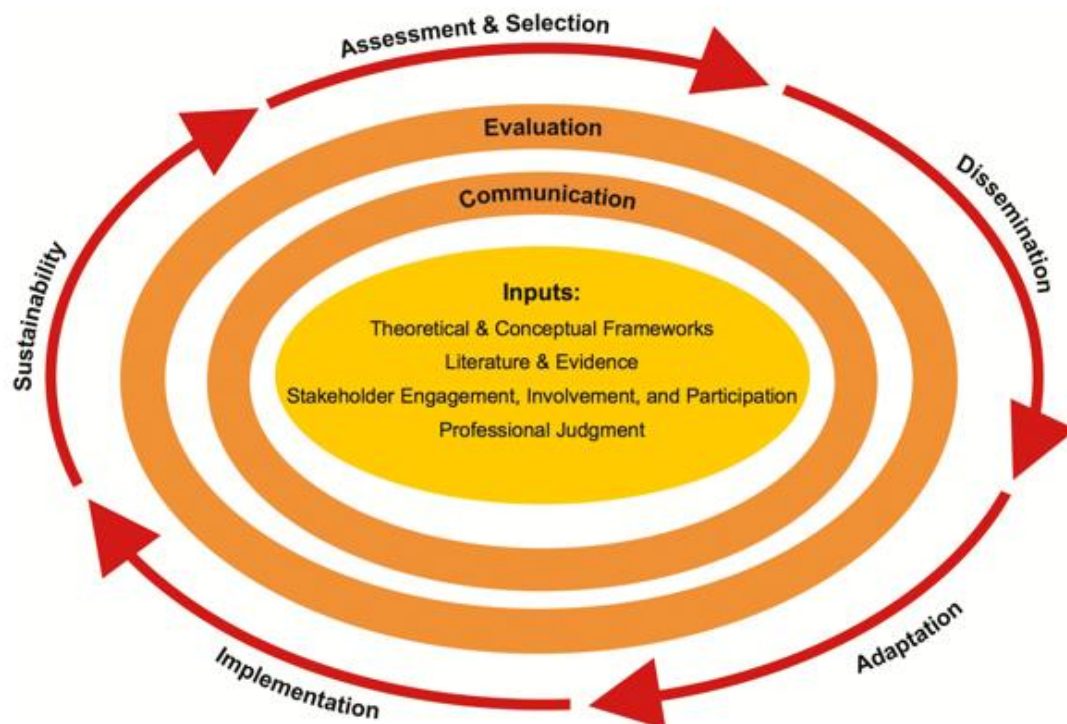
Implementation science recognises that translating research evidence into healthcare practice is not a simple process of locating strong evidence of intervention and applying it to similar health situations. There are often long delays between the creation of scientific knowledge and its application in routine healthcare practice; this is known as the knowledge–practice gap (Westerlund et al., 2019). The reason for this gap is that the spread and scale-up of implementation findings can be complicated (Greenhalgh & Papoutsis, 2019) as the evidence of effectiveness is most often produced in the highly controlled environment of RCTs, which may not factor in the intricacies of multi-layered self-organising systems (Greenhalgh & Papoutsis, 2019).

Healthcare organisations are complex, unique networks that comprise ‘a collection of individual agents with freedom to act in ways that are not always totally predictable’ (Plsek & Greenhalgh, 2001, p. 3) and can be potentially quite different to the controlled environment in which the evidence was produced. Therefore, to implement an improvement strategy or intervention, researchers need to identify, anticipate and factor in ‘uncertainty, context, culture, and the features of complexity’ (Braithwaite et al., 2017, p. 67) because ‘healthcare systems are ambiguous, deceptive and unpredictable’ (Braithwaite et al., 2017, p. 67). Implementation science theory provides the scaffolding to understand the complex nature of healthcare settings, as illustrated in Figure 3.1 (Koh et al., 2018). Implementation

science theory impels the researcher to understand how and why implementation succeeds by embracing organisational complexities, not ignoring them. Each domain and process pictured in Figure 3.1 was carefully addressed in the study design and methods as detailed in the published protocol.

**Figure 3.1**

*Domains and Processes in Dissemination and Implementation Science (Koh et al., 2018)*



### 3.2.2 Normalisation process theory

NPT provided a further theoretical lens to underpin the PACE-IT intervention. NPT is particularly salient in the PACE-IT study settings due to its complex structure and the multiple layers of key stakeholders involved. NPT provides a framework to guide the successful implementation and integration of complex interventions into routine practice and assists in understanding the context in which interventions occur (Murray et al., 2010). As Murray et al. (2010) assert, NPT helps explain how interventions work through planning and early implementation to beyond when the intervention becomes ‘embedded into routine

practice and disappears from view' (p. 2). The NPT framework focuses on the work that individuals and groups do to enable an intervention to be normalised (Murray et al., 2010). Four main components of the NPT framework are detailed in Figure 3.2: coherence, cognitive participation, collective action and reflexive monitoring.

The modifications made to enhance the PACE-IT project align with the Normalisation Process Theory (NPT) model, which provided a comprehensive framework for understanding and implementing interventions in healthcare settings. Coherence, in the context of PACE-IT, focused on refining the assessment process and ensuring a clear understanding of the intervention's purpose and impact. By connecting with stakeholders, modifications were informed by the sense-making process, ensuring that improvements addressed the identified needs.

Cognitive participation involves engaging stakeholders effectively, and in the case of PACE-IT, this involved connecting with stakeholders and agreeing on the project's value. This alignment ensured that the intervention was well-understood and supported by those involved, enhancing its chances of successful implementation.

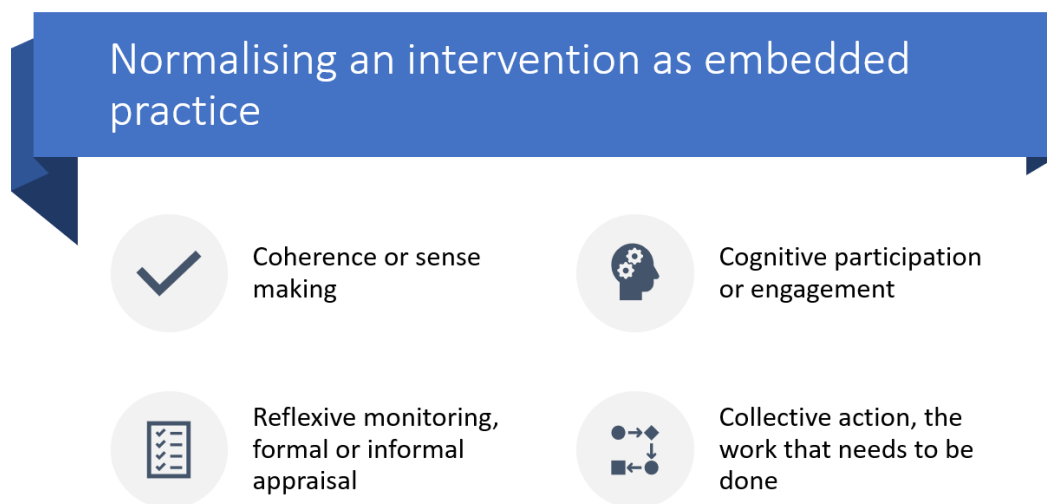
In adapting the intervention to fit the workloads of Emergency Departments (ED) and Residential Aged Care Facilities (RACFs), the collective action component of NPT was utilised. Streamlining the process to align with the realities of the workload for nurses in EDs and RACFs to reflect a collaborative effort in implementing the intervention. This modification acknowledges the practical constraints of these healthcare settings and aims to integrate PACE-IT seamlessly into their existing workflows.

Lastly, reflexive monitoring, the evaluation component of NPT, becomes integral to the ongoing success of PACE-IT. By continuously assessing the process, stakeholders can identify areas of improvement, measure the impact of the intervention, and make informed adjustments as needed. This reflective approach ensures that PACE-IT remains effective and

responsive to the evolving needs of EDs and RACFs. These components are expressed in the study design and explored further in Chapter 7. The evaluation of usability of PACE-IT was undertaken with the use of the non-adoption, abandonment, spread, scale-up and sustainability (NASSS) framework in Chapter 7.

**Figure 3.2**

The NPT Framework



### 3.3 PACE-IT study protocol

The published **PACE-IT study protocol** (reproduced below) (Sunner et al., 2020) details how the study would be conducted. The project aimed to assess whether enhancing ACE services by adding a protocol-guided interactive telehealth assessment and clinical decision-making process reduces ED transfers for RACF residents. The PACE-IT study protocol explains the methods, data sources, sampling strategy, recruitment, inclusion criteria, data collection and how the analysis would be conducted.

STUDY PROTOCOL

Open Access

# PACE-IT study protocol: a stepped wedge cluster randomised controlled trial evaluating the implementation of telehealth visual assessment in emergency care for people living in residential aged-care facilities



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## Abstract

**Background:** Transfer of residential aged-care facility (RACF) residents to Emergency Departments (ED) is common, risky and expensive. RACF residents who present to ED are more likely to have hospital readmissions, longer stays and face major risks related to hospital acquired complications. Aged Care Emergency services (ACE) is a nurse led, protocol- guided, telephone RACF/ED outreach model that has been shown to be effective in reducing hospitalisation and length of hospital stay for RACF residents in the Hunter New England Local Health District, New South Wales (NSW). The Partnerships in Aged-Care Emergency services using Interactive Telehealth (PACE-IT) project enhances ACE by incorporating interactive video assessment and consultation. The PACE-IT project's primary aim is to assess whether augmentation of ACE services through the addition of protocol-guided interactive Visual Telehealth Consultation (VTC) for clinical decision-making, plus telephone follow-up, reduces RACF resident transfers to ED.

**Methods:** A stepped-wedge cluster randomised controlled trial will be conducted. The intervention will be delivered sequentially to 8 clusters; each cluster comprises one ED and two RACFs in NSW, Australia. The 16 RACFs in the study will be selected for order of implementation using a computer-generated randomisation sequence. A 2-step randomisation process will be undertaken, randomising the hospital EDs first and then randomising the RACFs aligned with each hospital.

The PACE-IT intervention comprises: an initial phone call by RACFs to the ACE service in the ED; the ACE service in

(Continued on next page)

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ED responds with a protocol-guided VTC, a management plan agreed between all participants; an automated consultation summary letter to the General Practitioner and the RACF; a post VTC 24 h follow-up phone call to the RACF.

**Discussion:** If shown to be effective, the intervention has the potential to improve the clinical care and quality of life for residents. Findings will provide high level evidence that will inform sustainable change and broad translation into practice across NSW. It will show how the change has been achieved and highlight success factors for scalability and sustainability. It will inform review of processes, the development of policy and guidelines that will integrate PACE-IT into existing service models in NSW.

**Trial registration:** The trial is registered with the Australian New Zealand Clinical Trials Registry (Trial ID ACTR N12619001692123) 02/12/2020.)

**Keywords:** Agedcare, Telehealth, Telemedicine, Emergency department, Older person, Nursing home, Hospital avoidance, Visual telehealth

## Background

People aged over 65 are the fastest growing age group in the world with numbers predicted to double between 2019 and 2050, when one in six people will be aged over 65. For the first time in history, by 2050, people aged over 65 will outnumber those in the 15–24 age bracket [1]. This will place increasing pressure on existing health services [1], in particular emergency departments (ED) and residential aged care facilities (RACF). In Australia, in the six years from June 2012 until June 2018, there has been a 12.2% increase in RACF places; an increase of over 2% per year [1]. In 2016 the USA had 1,347,600 people living in RACFs [2].

Residents from nursing homes or RACFs, as referred in this paper, present to ED with many co-morbidities exposing them to complex and invasive investigations, treatments and procedures, many of which may not add value to their care [3–5]. A visit to ED exposes residents to three times the risk of new, acute respiratory or gastrointestinal infection [6], possible harm, emotional stress, or “iatrogenic complications” such as falls, medication errors, pressure injuries, delirium [3, 7–9] and death. RACF residents are more likely to be readmitted to EDs and have longer ED and hospital stays [3, 7–9]. As a consequence of a 12 h stay in ED almost one in five patients aged over 65 were reported to develop delirium, increasing their length of stay (LOS) in hospital by approximately one week [10]. Up to 40% of RACF resident transfers are considered to ED are avoidable [8]. With up to 75% of RACF residents transferred to ED annually the cost implications are substantial [11] potentially \$AUS12, 657,379 annually [12].

Nurse-led RACF/ED outreach models have been shown to be feasible, acceptable and cost effective [12] while decreasing ED presentations, waiting times, hospital admissions and LOS [7, 13–15]. Benefits of nurse-led RACF/ED outreach, together and similar hospital and aged-care partnership models, are well documented

in the literature [4, 11, 13]. Such models have the ability to streamline care for the RACF resident to facilitate their navigation throughout the health system in a safe and timely manner [16]. Some models report positive outcomes in communication with improved clinical handover, information sharing and staff having enhanced confidence in resident care [17].

The Aged Care Emergency (ACE) service model of care provides clinical support to nurses in RACFs, enabling residents to be managed at the RACF thus avoiding transfer to an ED [7]. The ACE service is a nurse led RACF/ED outreach model in Hunter New England Local Health District (HNELHD) in New South Wales (NSW), Australia. The ACE/Agedcare Service Emergency Team (ASET) nurse located in the ED provides this outreach service. The key principles of the service are to improve the experience and quality of care of residents, with better management of acute symptoms [18] ensuring the resident is receiving the best care in a timely manner.

Although RACF/ED outreach models, such as the ACE service for RACF residents, have been shown to significantly reduce hospitalisation, they could further reduce avoidable transfers to ED [3, 4, 7, 14, 19]. Currently models are limited by variable acceptance and uptake [12, 14, 15], lack of trained staff in RACFs, high RACF staff turnover, unavailability of resources, poor bi-directional communication and the restrictions of telephone-only assessment [12, 14, 20–22]. Some models are informal, reliant on “a passionate ED physician” [16] to provide advice, placing restrictions on the timeliness of their availability at the time of the call.

The use of a visually augmented telehealth consultation has been recommended as one means by which to overcome many of these challenges [10]. An unpublished local pilot project established that the Visual Telehealth Consultation (VTC) is acceptable to staff and families, and reduces the disruption and distress associated with unnecessary transfer to hospital for residents



and families. Telehealth is a well-established means of supporting the RACF resident by providing timely consultation with RACF staff, enabling high quality health care, which can reduce unnecessary hospitalisation [23]. However, evidence supporting the use of VTC in RACF/ED outreach models of care is limited in number [24, 25].

A Nurse-led RACF/ED outreach model implemented in conjunction with VTC capability has the potential for synergistic benefits. Qualitative studies identify that visual telehealth adds value to care, timeliness of care and fills gaps in service provision [26]. The need for better engagement with staff, residents and families has also been highlighted as central to the success of future initiatives [14, 27, 28]. The addition of the VTC alone has been reported to reduce ED presentations and hospitalisation of residents by up to 37% [25].

More studies are needed to understand which telemedicine tools and processes are most effective in improving outcomes for residents. Previous video-based models have been hampered by unavailable or unreliable internet and the need for expensive equipment [26]. No studies have examined the effectiveness of the nurse-led ACE model with the addition of VTC in reducing ED presentations from RACFs. Reviews and meta-syntheses of VTC in RACFs indicate limitations to studies, inconsistent outcome measures and the need for more large-scale implementation studies [25, 29]. The aim of the Partnerships in Aged-Care Emergency services using Interactive Telehealth (PACE-IT) project is to determine whether the introduction of VTC can further reduce overall transfers of residents to ED.

## Methods/design

### Aims

The three aims of the study are to;

1. assess whether the augmentation of ACE services through the addition of protocol guided interactive VTC for clinical decision-making, plus telephone follow-up, reduces RACF resident transfers to ED compared to usual care.
2. assess the acceptability of the model to RACF and ACE/ASET staff as well as any barriers and enablers to implementation.
3. explore the experience of the model from the perspectives of residents and family in relation to their level of involvement in decision making, the management plan, communication and outcomes.

### Hypothesis

The PACE-IT intervention will result in a 30% reduction in RACF resident transfers to ED compared with usual care.

**Primary outcome:** reduction of 30% in the rate of ED presentations from RACFs per 100 RACF beds.

### Secondary outcomes:

Secondary outcomes:

- Presentation to ED within 48 h post VTC consultation to identify any adverse events
- ACE/ASET and RACF staff perceived barriers and enablers to implementation and sustainability at three months post intervention
- ACE/ASET and RACF staff acceptability and engagement three months post intervention; RACF staff perceptions of VTC usability survey within 48 h of participating in a VTC
- Resident and family experiences of participating in the intervention one-month post implementation
- Cost consequence analysis

### Design

This implementation study uses a stepped-wedge cluster randomised controlled trial (RCT) design [30, 31] together with qualitative assessment of barriers and enablers to implementation and clinician and RACF resident/family acceptability of the PACE-IT intervention. Refer to Figs. 1 and 2. Whilst adhering to SPIRIT guidelines/methodology.

### Governance

Committee established for governance and overseeing of the project.

### Setting and participants

The intervention sites consist of EDs of four acute hospitals and 16 associated RACFs in two Local Health Districts (LHD) in NSW, Australia. The EDs have been selected for their metropolitan and rural locations; LHD A has two metropolitan and one rural ED and LHD B has one rural ED. Each cluster comprises one ED and two RACFs. Each selected ED has approximately 350 RACF beds, totalling 1435 beds across all 16 participating RACFs.

Residents and family members who have participated in a VTC call as a part of this intervention will be invited to participate in individual interviews in a private location within their RACF. RACF staff will be invited to complete an anonymous survey within 48 h of completing a VTC. RACF staff and aged care emergency nurses will be invited to participate in focus groups held in private locations within their facility or via videoconference.

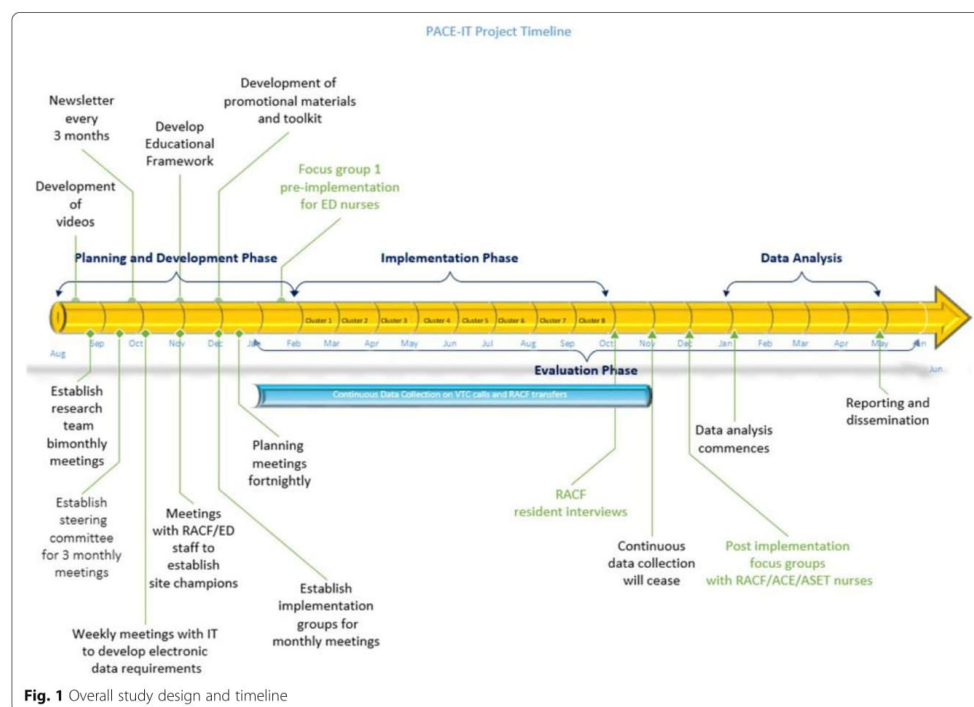
**Intervention participation:** This is a cluster randomised control trial with an intervention that builds on an already embedded model of care (ACE model) [15], therefore residents requiring a VTC consultation will be in the participant group, but their written consent will not be sought. Consent has been obtained at an organisational level. Residents may choose to opt out of the VTC component and will experience the standard telephone consultation.

**Figure 3.3**

*Implementation Timeline for the Stepped Wedge Cluster RCT*

**Figure 3.4**

*Overall Study Design and Timeline*



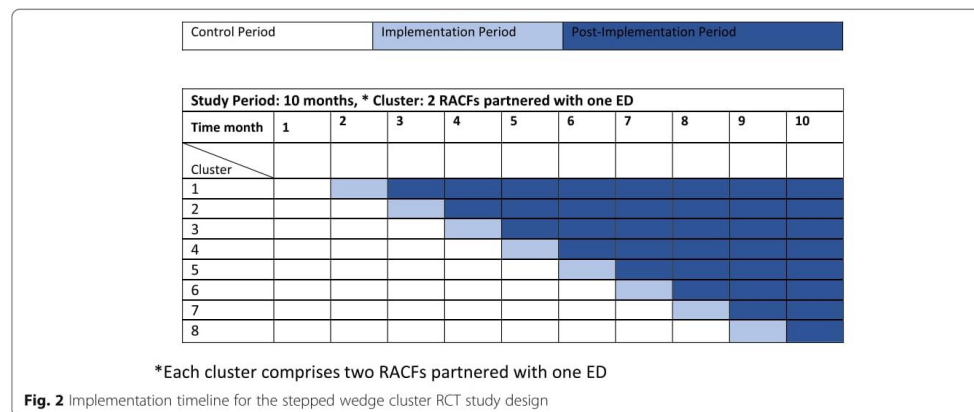
**Fig. 1** Overall study design and timeline

#### Inclusion criteria

RACFs that have: a participating hospital ED from one of two participating LHDs; high rates of ED transfer (> 40 per 100 beds/annum); are VTC willing and able (Wi-Fi technology, mobile tablet, laptop or Workstation on

Wheels available) agreed number of staff trained for VTC; high level support from the RACF organisational governance body.

EDs that have: ACE services and/or ASET nurses that provide an outreach service to RACFs.



**Fig. 2** Implementation timeline for the stepped wedge cluster RCT study design



RACF residents and family who experience the PACE-IT intervention.

RACF and ACE/ASET staff who have participated in the PACE-IT intervention.

#### Intervention

The PACE-IT intervention provides an interactive VTC to enhance assessment and decision making augmenting the current ACE model of care. When a resident is unwell, and the GP is unavailable and there is a planned transfer to ED, the RACF staff member will initiate the following protocol:

1. **RACF nurse contacts ACE/ASET nurse** through a centralised 1300 phone number contacting the ACE/ASET nurse in the appropriate ED.
2. **Request for VTC** over the phone including information RACF staff member name, RACF facility name and the time of the proposed VTC, with a suggested time frame usually within 5–10 min.
3. **An interactive VTC is attended** by the ACE/ASET, RACF nurse, the resident and a family member if available.
4. **An ISBAR [32] handover** (introduction, situation, background, assessment, recommendation) is provided by the RACF nurse and the ACE/ASET nurse the details in the patients' electronic medical record as an ED episode.
5. **A management plan is developed** through shared decision-making amongst the ACE/ASET nurse, the resident, RACF staff and any family members (if present in the consultation). A decision is made that the resident either remains in the RACF or is recommended to present to ED.
6. **A consultation summary** is auto generated and sent to the GP and RACF outlining the reason for the call and the outcome.
7. **A follow-up phone call** from the ACE/ASET nurse to the RACF will be undertaken within 24 h of the PACE-IT consultation, if the resident is not transferred to ED or admitted to hospital. Follow-up phone calls will identify what alternative non-hospital services were accessed, what treatment was delivered, and any adverse events. These data are also logged electronically in the ED patient management system (PMS).

NB. Usual care (ACE MoC) involves a phone call only with an ISBAR handover and an agreed management plan consistent with points 1, 4 and 5 above.

#### Power and sample size calculation for the primary outcome

Local audit data identified 82 RACF ED presentations/100 beds annually. With the 16 RACFs contributing

1435 beds (Mean = 87) in this study, adopting the intervention in the sequence shown in Fig. 1, will have 80% power to detect a 35% relative reduction in ED presentations /100 beds annually (at 5% significance) assuming an intra-class correlation of 0.01.

#### Randomisation

There will be four hospital EDs and 16 RACFs (four RACFs are aligned with each hospital ED). A 2-step randomisation process will be undertaken in Stata 14.1. Firstly, the four hospital EDs will be randomised, with each ED occurring twice, to create 8 clusters. Then the RACFs aligned with each hospital will be randomised in pairs, thus ensuring that each cluster has one hospital ED and two RACFs. The statistician was not blinded to the study sites during allocation.

The statistician was not blinded to the study sites during allocation.

#### Recruitment

The ED recruitment will be made by contacting LHD facility executive to consent for their participation in the project. The RACFs will be recruited by contacting the appropriate executive requesting a signed letter of agreement that denotes their approval and consent participate. Following this recruitment strategy, we hope to achieve the required sample size.

#### Resident interviews

RACF staff will approach any resident who has participated in a VTC as part of the PACE-IT intervention within a month of the call, with an information letter, consent form and reply-paid envelope to enable them to return a signed consent to participate. The researcher will then contact the RACF to answer any questions the resident may have and to arrange a suitable date and time to conduct the interview. The participant must be able to provide informed consent to participate in interviews; this decision is made at the discretion of the RACF staff.

#### Focus groups

All ED and RACF members who have participated in a VTC as part of the PACE-IT intervention, will be invited to participate in a focus group via their work email. An information letter and consent form will be provided. Signed consents can be returned via email and consenting participants will be contacted to arrange a suitable date and time.

#### Implementation strategy

Implementation strategies incorporating engagement, facilitation [33], education [34], resource development, resource deployment [30] and monitoring and feedback

**Table 3.1***Implementation Strategies*

will be utilised to embed PACE-IT into participating facilities [35]. The Normalisation Process Theory (NPT) provides a framework to guide successful implementation and integration of complex interventions into routine practice [36]. NPT helps explain how interventions work through early implementation to beyond when the intervention becomes “embedded into routine practice and disappears from view” [36].

Prior to implementation commencing at each site, information sessions will be attended; video, progress newsletters and brochures will be circulated to inform stakeholders of the practice change involved in the intervention (e.g. general practitioners). Refer to Table 1.

**Data collection**

Primary outcome data measuring RACF resident ED transfers and VTC calls will be collected monthly from the electronic PMS and will include information on demographics, presenting problem and call outcome (transfer to ED or alternative care pathway). All data will be stored securely in password protected electronic data bases and access will be restricted to

selected members of the research team. All data will be de-identified to protect the confidentiality of the participants. All data will be cleaned and checked carefully prior to analysis.

Adverse events or unintended outcomes will be monitored by a post VTC 24 h follow-up phone call from the ACE/ASET nurse to the RACF as well as documenting any presentation of the RACF resident to ED within 48 h of the VTC. The follow-up phone call will ask six questions enquiring about: the resident’s condition, as well as confirming whether the consultation summary letter was received, providing any clarifying information if required and addressing any further concerns. The post VTC 24 h follow-up phone call will document the outcomes for any resident not transferred to ED as well as any alternative non-hospital service, outpatient service or treatment at the RACF. Data will be collected from the electronic PMS as a daily report on all VTC calls.

Pre-implementation video conference focus groups with four to eight ACE/ASET nurses inform potential barriers and enablers assisting with implementation/educational strategies.

**Table 1** Implementation strategies

Strategy	Rationale	Delivered to and where	When/how often
<b>Engagement</b>			
Establish implementation groups	Increase awareness, identify barriers and develop context specific implementation strategies	RACF staff and ED ASET nurses	Establish 3 months before implementation and meet monthly before and during planning/intervention/implementation
<b>Education</b>			
ED visits by RACF staff	Increase awareness of residents’ ED transfer experiences	RACF staff and ED managers	Initial implementation of intervention and ongoing with change of RACF staff
RACF visits by ACE nurses and Telehealth Coordinators	Understand RACF context to enable implementation	ACE nurses at RACF sites	Every RACF at initial implementation
Education sessions on VTC and handover model	Increase RACF staff awareness of intervention	RACF staff	Initial implementation, ongoing with change of RACF staff
Staff training about video conference	Familiarise ED and RACF staff with video conference equipment used in intervention	RACF staff and ACE nurses at each ED	Initial implementation
<b>Resources</b>			
RACF Aged-Care Emergency Clinical Resource Manual	Guide ACE nurses in decision making for care of RACF residents	ACE nurses	Project start
Manual for VTC and handover model including video conferencing	Guide ACE nurses and RACF staff to normalise the VTC and handover via video conferencing	ACE nurses and RACFs	Project start
Establish video conferencing system	Familiarise ED and RACF staff with video conference equipment used in intervention	EDs and RACFs	Project start
Project information sheet and information videos	Inform staff at RACFs and EDs about proposed model of care	EDs and RACFs	Ongoing
<b>Compliance audits and feedback</b>			
Compliance audits and feedback	Monitor compliance and empower staff to continue with implementation strategies	Each site	Monthly from start of the implementation

Post-implementation focus groups (five) will be held with ACE/ASET nurses and RACF staff who participated in VTCs to identify barriers and enablers to uptake and ongoing sustainability and perceived benefits of the VTC interaction. These focus groups will be conducted three months post implementation.

Engagement, uptake and acceptability of the intervention for RACF staff will be measured using a 21-item electronic survey, sent via email to RACF staff the same day they participated in a VTC with the ACE/ASET nurse for completion within 48 h. The survey gathers information about RACF nurse demographics and VTC call details and includes Likert-scaled questions exploring the respondent's experience related to accessibility, quality of the visual connection, engagement and usefulness of the VTC.

Acceptability and experiences of VTC for RACF resident and family will be obtained via 16–20 individual face to face or teleconference interviews with RACF residents and family members who were involved in a VTC as part of the PACE-IT intervention. Interviews with participants will be held within one month of their participation. Interview participants will be spread across all RACFs. Participants will be asked about their experience being involved in the VTC, specifically, their involvement in decision making, the management plan, communication and outcomes.

An external steering committee independent from the project investigators will monitor and discuss trial procedures. This committee consisting of members from the; NSW Ministry of Health, LHD executive, ethics, aged care, ED, statistician, RACF executive meeting every 3 months as per the protocol. This committee has the governance to stop the research if they recognise potential negative impacts on the well-being of participants, the committee will monitor adverse events and data discrepancies and will establish trial stopping rules as per the terms of reference. The senior researcher can convene a meeting with the committee at any time to review any unforeseen issues outside the 3 monthly scheduled meetings.

Missing data will be monitored each month and will be addressed on an ongoing basis as the project progresses. All noticeable omissions will be discussed at monthly meetings with the ACE/ASET staff and ongoing education will be carried out.

#### Data analysis

Primary outcome, ED presentation data will be analysed to identify presentations involving transfer from the participating RACFs. The ED presentation data will be collected for each RACF per month, and the rate of ED presentations (per RACF beds) will be compared between intervention and control periods using a

generalised linear mixed effects regression model (Poisson or negative binomial with a log link). The model will include; number of ED presentations in that period as the outcome variable; fixed effects for step and period; random effect for site; and the log number of RACF beds per facility as an offset term. The study is designed so that the onset of winter will be approximately the mid-point of the study, such that the aggregated control and intervention time periods across steps will involve equal amounts of winter/non-winter time (periods 4, 5 and 6, Fig. 1), thus accounting for seasonal variations during the “flu” season. The fixed effect for step will control for a common underlying secular trend across all clusters [31]. Data which is missing from the routinely collected datasets will be imputed for analysis.

Secondary outcomes will be quantitatively analysed with a descriptive summary collected from focus groups, interviews and surveys. Focus group and interview transcripts will be coded, categorised and themed using low-level interpretation to provide a narrative overview of staff experience [37]. Survey data analysis will provide descriptive statistics regarding staff, resident and family satisfaction with VTC and Information Technology (IT) processes.

A cost-consequence analysis (CCA) will be undertaken from the perspective of health services. The CCA will include intervention costs for labour, materials, overheads, travel, promotional materials and video production. The analysis will also capture downstream costs/costs-avoided through changes in ED presentations and readmissions. If results show evidence of intervention effectiveness, a budget impact analysis will be prepared, showing anticipated costs and outcomes over an annual health service budget cycle, with projections for three to five years.

#### Dissemination plans

Communication of findings from the primary and secondary outcomes will be disseminated via peer-reviewed publications, conference presentations and local forums and will also be reported to the funding body, the ‘NSW Ministry of Health’. Findings will also be presented to the participating RACFs and at ACE interagency and implementation meetings (these will be held monthly throughout the project) and via regular PACE-IT newsletters.

The content of this research will help inform the review of processes, the development of policy and guidelines that will integrate PACE-IT into existing service models. The findings of this study will produce knowledge that will be sustained and spread through the stakeholder network established as part of the project.

#### Discussion

Currently there is limited rigorous evidence regarding nurse-led integrated models of care for assessment and



treatment of acutely unwell RACF residents. If successful, this project will produce robust evidence regarding the effectiveness of a nurse-led interactive visual Telehealth integrated model of RACF/ED outreach care for RACFs. Evidence from this study will inform the design and delivery of a better connected and integrated health care system, supporting hospital avoidance and patient care delivered in the right place at the right time by the most appropriate healthcare provider [38].

When the PACE-IT model of care is implemented and translated into clinical practice it will result in reduced ED activity and reduced inappropriate use of the NSW Ambulance service and ED services for 12,622 older people currently residing in RACFs in LHDs A and B.

If scaled across NSW, the ACE/ASET VTC will benefit 68,967 such residents, potentially avoiding 15,000 avoidable presentations to ED per year.

The strength of the PACE-IT model is its potential for scalability and sustainability, with the advantage of utilising and enhancing existing resources and infrastructure like ACE/ASET nurses and the ACE model of care. There will be opportunity for the study partners to develop a strategy for rollout of the intervention more broadly in NSW. The participating EDs in the project will in turn be able to further extend PACE-IT model of care to all RACFs with whom they accept RACF transfers from. The RACF regional managers will have an opportunity to champion implementation across RACFs within their umbrella organisations.

Resources developed during this study will be available to facilitate the scalability and wider implementation of PACE-IT. Resources include PACE-IT guidelines developed by the PACE-IT governance group, including all relevant NSW stakeholders (Ministry of Health/ Clinical Excellence Commission/LHD/Primary Health Network (PHN)/RACF/NSW Ambulance Service). The PACE-IT education toolkit can be produced as an on-line resource, accessible at any time, so no additional toolkit or staff education costs are incurred. Other resources (posters, information brochures, information videos) will be made available to supplement the guideline and adapted for local contexts.

PACE-IT will inform a review of processes, the development of policy and guidelines that will integrate PACE-IT into existing service models. Executive endorsement and distribution of the guidelines through established systems will ensure wide dissemination of knowledge and the protocol for RACFs/EDs to implement. The viability of having the service extend to 24 hours per day and 7 days per week will be determined by cost consequence analysis findings from this study. This will in turn inform ED decision-makers of the potential benefit of adopting 24/7 VTC for RACF residents in the future.

Findings of this study will produce knowledge that will be spread throughout the stakeholder network established as part the project. PACE-IT has the potential to improve the clinical care and quality of life of the resident. It will provide high level evidence that will inform sustainable change and translation into practice across NSW.

### Supplementary information

Supplementary information accompanies this paper at <https://doi.org/10.1186/s12913-020-05539-1>.

**Additional file 1.** PACE-IT Survey.

### Abbreviations

ACE: Aged care Emergency; ACI: Agency for Clinical Innovation; ASET: Agedcare Service in Emergency Team; CCA: Cost Consequence Analysis; ED: Emergency Department; GP: General Practitioner; HNELHD: Hunter New England Local Health District; JHH: John Hunter Hospital; LHD: Local Health District; LoS: Length of stay; MOH: Ministry of Health; NSW: New South Wales; NUM: Nursing Unit Manager; PACE-IT: Partnerships in Aged-Care Emergency services using Interactive Telehealth; PHN: Primary Health Network; PMS: Patient Management System; RACF: Residential Aged Care Facility; VTC: Visual Telehealth Consultation; Wi-Fi: Wireless fidelity

### Acknowledgements

We would like to thank the funding body NSW, Ministry of Health Translational Research Grant Scheme, the advisory committee members and the partners for their support and contribution to the project. The RACFs and EDs for their participation, enthusiasm and support for the project and their willingness to share their experiences.

### Declarations

N/A

### Authors' contributions

CS and MG contributed to developing the research concept, and CS, MG, VP, SD contributed to the design and method development. CS, MF, MG and KB contributed to the initial draft of the study protocol. CS has developed the initial draft of the manuscript, with significant input from MG, MF and KB. The final draft has been significantly and critically revised for relative scientific content by MG, MF, SD, VP and AK. All authors approved the final versions of the manuscript.

### Funding

The study is funded by the NSW Health Translational Research Grant Scheme (Round 4) and can be contacted via the NSW Ministry of Health, phone (02) 93919000, or via email [TRGS@doh.health.nsw.gov.au](mailto:TRGS@doh.health.nsw.gov.au). The funding body has no role in the design of the study, collection, analysis or interpretation of data and in writing documents relating to the study. The study has been independently peer reviewed by the funding body.

### Availability of data and materials

The study data will be made available via a web-based de-identified data file to protect the privacy of participants and organisations described in the study, data available by contacting the first author of this paper.

### Ethics approval and consent to participate

We will obtain written informed consent from all study participants who were interviewed or attended a focus group. The Hunter New England Human Research Ethics Committee (2019/ETH12853) and the University of Newcastle Human Research Ethics Committee (H-2020-0090) have approved this study. All study LHD trial sites have ethical site specific approval and the RACFs provided appropriate approval. Participants will be assured that their privacy will be protected using de-identified data for analysis and reporting prior to consenting to focus groups

and interviews. Consent will not be sought for residents to participate in a VTC because once implemented this will be considered routine practice. However, the resident will have the opportunity to opt-out of the VTC component of the process if they choose to. Survey participants will remain anonymous, individuals will not be identified in results, and direct quotes from focus group transcripts will use pseudonyms.

**Consent for publication**  
Not applicable.

**Competing interests**  
The authors declare that they have no competing interests.

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Received: 18 May 2020 Accepted: 13 July 2020  
Published online: 20 July 2020

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Refer to Appendix A for the PACE-IT staff survey.

### **3.4 Ethics**

Due to the complexity of the data collection and methods, this section has been added to clarify the finer details of the PACE-IT protocol, including the ethical considerations, risks and benefits, informed consent and privacy, confidentiality and data storage.

#### **3.4.1 Ethical considerations**

Ethics approval for the research was guided by the requirements of the National Statement of Ethical Conduct in Human Research (National Health and Medical Research Council [NHMRC], 2018). The following sections provide the ethical considerations for the PACE-IT study, including the stepped wedge cluster RCT, PACE-IT staff survey, focus groups with RACF and ASET nurses and the 24-hour follow-up phone call with RACF staff and RACF-resident engagement. Ethical considerations relating to the PACE-IT project and the participants and the confidentiality and safety of the RACF residents were a high priority. The main ethical considerations were the risks and benefits of the research, informed consent, storage of data, confidentiality and identifiability of all information obtained.

#### **3.4.2 Risks and benefits**

The ACE program was already well embedded in EDs and RACFs before commencing the PACE-IT project and had well-developed risk management processes inbuilt. These embedded risk management processes included patient/resident confidentiality, healthcare management protocols for commonly experienced acute health episodes, and strict governance via operational meetings chaired by a health service executive manager. Additional risk management processes for PACE-IT included regular meetings convened with the PACE-IT study team and senior-level executives from RACFs, LHDs, Hunter Primary Care, the NSW ambulance service liaison officer and the ACE clinical nurse consultant. These processes continued to be adhered to, ensuring safe and high-quality care continued. In this project, the ACE service was simply being augmented using a VTC along

with the provision of additional education and communication strategies for both RACF and ACE staff. In addition, a 24-hour follow-up phone call to the RACF from the ED, post-VTC, was incorporated to identify any unanticipated risks and adverse events.

Structured clinical handover when a RACF resident is transitioning care is a requirement of the National Safety and Quality Health Service (NSQHS) standards in Australia (Australian Commission on Safety and Quality in Health Care [ACSQHC], 2023). It is an expectation for a health service in Australia to implement a structured handover when a patient is transferred to another health service organisation (e.g., from a hospital to an aged care home, another hospital, community nursing or a palliative care service) (The Australian Council on Healthcare Standards [ACHS], 2015). ACE is the well-established communication process used for structured clinical handover tools (Appendix B) between RACF and ASET nurses. Every effort was made to inform the next of kin, GPs and all health providers linked with the residents through newsletters (Appendix C), PACE-IT brochure (Appendix D), educational session plan (Appendix E) and education resources that included an information film and an instructional film for nurses (Appendix F) that visual telehealth would now be included in healthcare decision-making. This approach was approved through the local Human Research Ethics Committee (HREC) and all participating RACF ethics processes.

The recruitment strategy was respectful of potential participants and facilitated their voluntary participation. Residents were not part of the recruitment strategy as ACE was part of usual care, and the addition of VTC was an augmentation of ACE. Research design and methods were developed in consultation with consumer representatives, GPs, RACF/ASET nurses and ED clinicians.



### 3.4.3 Informed consent

The steps for each consent component—the step-wedge RCT, PACE-IT staff survey, focus groups with RACF and ASET nurses, 24-hour follow-up phone calls with RACF nurses and RACF-resident engagement—are described below.

**Step-wedge RCT:** The unit of randomisation in the stepped wedge RCT was at the level of each health service and RACF. Therefore, the chief executive officer (or the person with delegated authority) in each setting was approached to invite the participation of their health service in the study. Data sharing between health services was achieved using a secure data transfer platform directly to the designated research statistician. The ACE handover model of care (MOC) complies with the NSQHS standards; therefore, consent was not required for residents to participate as the inclusion of VTC was an augmentation of ACE and was considered a component of usual care.

**PACE-IT staff survey:** All RACF nurses present at the pre-implementation training were given an information statement about the study and the online staff survey. The RACF contact person also placed all the information in a resource folder for future reference. An email with a link attached to the online survey (Appendix A) post the VTC was sent directly to the RACF staff member who participated in the call via the RACF contact person, inviting them to participate in the online survey. A response to the survey indicated each person's consent to participate.

**Focus groups with RACF and ASET nurses:** After obtaining the ethics approval (Appendix G), an information statement (Appendix H and I) outlining the project was provided with an invitation to participate in focus groups. This included the aim of the study, what they would be asked to do, how their privacy would be protected, how their information would be used, what they needed to do to participate and the knowledge that they could withdraw at any time. It also outlined any risks or benefits of participating. The respondent

was made aware that their information would remain confidential and they would have the opportunity to have their questions answered to their satisfaction at any time.

**24-hour follow-up phone call:** Consent was not required to participate in the call as it was considered usual/standard practice and care for patients to be phoned 24 hours after discharge to reinforce a care management plan and troubleshoot any health issues that may have arisen since discharge.

**RACF-resident engagement:** Individual residents were not required to read an information statement or sign a consent to participate. However, the RACF resident was always permitted to decline a telehealth consultation if they did not wish to participate in the visual component of the consultation. In that case, a telephone consultation (without video) would occur between ACE and RACF staff.

Consent, adhered to the standards and guidelines that align with the ethical approval processes outlined by the Australian National Health and Medical Research Council. The Hunter New England Human Research Ethics Committee (2019/ ETH12853) and University of Newcastle Human Research Ethics Committee (H-2020-0090) approved that individual informed and signed consent for residents was waived in this study given that the intervention was being implemented at facility level and was considered part of usual care and practices (adding a visual augmentation of already existing routine ACE practices). All individual clinical data were collected, de-identified and reported in accordance with Australian National Health and Medical Research Council and these methods were approved by the Hunter New England Human Research Ethics Committee (2019/ ETH12853) and University of Newcastle Human Research Ethics Committee (H-2020-0090).

### **3.4.4 Privacy, confidentiality and storage of data**

**Resident clinical data:** All personal identifiers were required in the initial data collection phase to track the resident for the 24-hour follow-up call and identify residents that

required a subsequent presentation to the ED within 48 hours of the VTC. However, when all clinical data were linked and aggregated, the data were de-identified for analysis and reporting to protect the anonymity of individuals.

**24-hour follow-up phone call:** The data remained identifiable until data collection was complete and 48-hour presentations to the ED were checked. After this time, data related to this VTC were de-identified and coded to be re-identified later to check for repeated VTCs on the one resident.

**Focus groups:** Recordings of the focus groups were transcribed with any identifying information removed from the transcripts. Participants were allocated pseudonyms and were thus non-identifiable, ensuring anonymity. The publication reporting the aggregated data included no identifiable data.

**Data analysis:** All aggregated analysis data remained non-identified, and any data reporting was non-identified. Non-identifiable data from LHD B were transferred to the researchers via a secure data transfer platform.

**Survey data:** The RACF staff that participated in the survey were de-identified. The participating RACFs were allocated a number. The RACF response location was required to provide further targeted education. Individual participants could not be traced or identified once surveys had been submitted (Appendix A).

Removing participant personal identifiers during the data aggregation and analysis phase ensured anonymity for all participants/respondents. The PACE-IT researchers abided with all regulatory guidelines relating to the reporting of findings and ensured all identified information was removed from final reports, presentations and publications relating to PACE-IT.

**Data storage:** Following the completion of data collection and analysis, all coded data were lodged in a secure password-protected directory for seven years, after which all

information and data will be destroyed as per the National Statement on Ethical Conduct in Human Research (NHMRC, 2018).

**Ethical approvals:** The HNE HREC (2019/ ETH12853) and the University of Newcastle HREC (H-2020-0090) approved this study (see Appendices E–J for ethical approval and information statements).

### **3.5 Summary**

In this chapter the methodology and study procedure have been described, including the published study protocol for the stepped wedge cluster RCT. The study protocol outlined the methodology of the project and the implementation strategy, timeline, data collection process and additional ethical details for the PACE-IT project. When the PACE-IT project was set to begin in February 2020, Australia entered a state of pandemic preparedness, which severely limited access to residential aged care institutions for extended periods. The next chapter interfaces with this study protocol as the COVID-19 preparedness study was designed to help inform the research team on how best to support RACFs involved in the PACE-IT study.

## **Chapter 4: COVID-19 preparedness**

In this chapter, is a study that was undertaken when the COVID-19 pandemic interrupted the start of the PACE-IT project. The COVID-19 preparedness study was conducted in 2020 and took three months to complete. This study was published in 2021 and the results were used to support the research participants in the PACE-IT project with the changing clinical landscape???

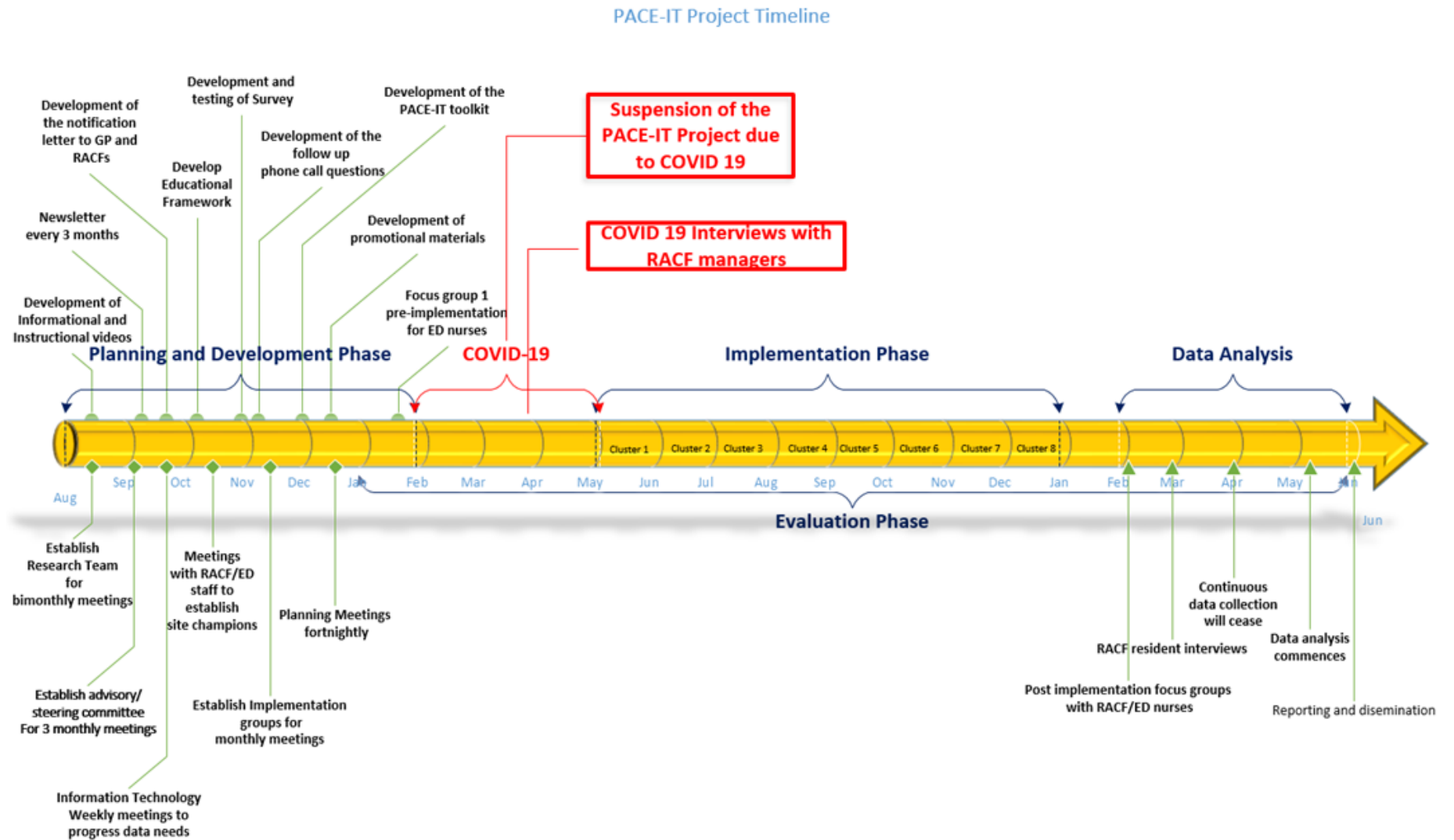
### **4.1 Introduction**

The PACE-IT study was due to commence in February 2020; however, the outbreak of COVID-19 changed this plan. The PACE-IT study was suspended due to the Australian public health orders only allowing the entry of essential staff to RACFs. The COVID-19 preparedness study was designed to help inform the PACE-IT research team of the managers' preparedness towards COVID-19 and provide valuable insights into how the project would need to pivot and change to continue to implement in a manner that was safe for all involved.

This COVID-19 preparedness study aimed to explore how managers of RACFs were responding to the COVID-19 pandemic. The study was used to inform and enhance an understanding of the contextual challenges RACFs faced at the outset of the pandemic that coincided with the commencement of the PACE-IT study. With the unexpected arrival of COVID-19 in 2020, this information helped to pivot, adapt and modify the PACE-IT study implementation strategy as needed amidst the restrictions of the pandemic. The PACE-IT project study timeline is depicted in Figure 4.1. Activities conducted during the suspension period are in red-coloured text.

**Figure 4.1**

*Project Timeline, Including COVID-19 Preparedness in the Aged Care Study*



## 4.2 Exploring residential aged care facility managers' pandemic preparedness



Received: 6 December 2020 | Revised: 19 April 2021 | Accepted: 22 June 2021

DOI: 10.1111/jocn.15941

ORIGINAL ARTICLE

Journal of  
Clinical Nursing WILEY

### COVID-19 preparedness in aged care: A qualitative study exploring residential aged care facility managers experiences planning for a pandemic

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#### Funding information

Translational Research Grant Scheme funded project with the Ministry of Health, New South Wales, Australia

#### Abstract

**Aims and Objectives:** The study aims to understand the changing context of RACFs and the role of RACF managers in preparing to confront the COVID-19 pandemic and to provide insights into how the use of visual telehealth consultation might be incorporated to assist with managing whatever might arise.

**Design:** An interpretive descriptive study design was employed, and data were collected using semi-structured interviews conducted via telephone or videoconference. Purposive recruitment targeted clinical managers responsible for the COVID-19 response in RACFs.

**Methods:** RACF clinical managers were invited to discuss their responses to COVID-19 including the management of RACF and staff. Semi-structured interviews explored the COVID-19-related challenges, the response to these challenges and how telehealth might assist in overcoming some of these challenges. This study followed Thorne's (2008) three-stage process of interpretive description. The COREQ checklist was used in preparing this manuscript.

**Results:** Two main themes were identified. The first theme 'keeping people safe' was comprised of three subthemes; fear and uncertainty, managing the risks and retaining and recruiting staff. The second theme was 'keeping people connected', had two subthemes; being disconnected and isolated and embracing technology.

**Conclusion:** Findings from this study provide valuable insight into understanding the context and the challenges for RACFs and the staff as they attempt to keep residents safe and connected with healthcare providers and the outside world.

**Relevance to Clinical Practice:** Understanding the experiences of RACF managers in preparing to respond to the pandemic will better inform practice development in aged care in particular the use of telehealth and safe practices during COVID-19. Increased awareness of the challenges faced by RACFs during a pandemic provides policymakers with valuable insights for future planning of pandemic responses.

#### KEYWORDS

disaster, experiences, interpretive research, long-term care facilities, nursing homes, older patients, patient safety, qualitative study, residential homes

**1 | INTRODUCTION**

The World Health Organisation declared COVID-19 a pandemic on 11 March 2020 and by September 2020 there were over 30 million confirmed cases, with just under a million confirmed deaths (WHO, 2020). Internationally, governing bodies are warning older people that they are at greater risk of contracting a COVID-19-related illness, leading to poor outcomes (Brooke & Jackson, 2020; Fisk et al., 2020; Werner et al., 2020). Deaths occurring in residential aged care facilities (RACF) have been reported to comprise almost 80% of Canada's COVID-19-related deaths, with 50% in Switzerland (Faghanipour et al., 2020), 42%–57% in European countries (McGilton et al., 2020) and 66% of deaths in Australia. Consequently, it is important to understand the many challenges faced by RACFs whilst they were responding to the COVID-19 pandemic, and to explore ways they may be supported through this difficult time.

**1.1 | Background**

Regrettably, RACFs were caught unaware by the COVID-19 pandemic. The speed with which the virus took hold left vulnerable older people and RACF residents susceptible to illness and premature death. Most cases of COVID-related deaths in RACFs have been reported to be because of poor preparedness plans and RACF organisational deficiencies in Australia (Marozzi, 2020) and globally (Faghanipour et al., 2020). Prior to the pandemic it was already well recognised that there was a need to address systemic failures in facility design inadequacies and infection control practices given the high rates of transmission of infectious disease in RACFs (Davidson & Szanton, 2020). The importance of pre-emptive pandemic planning for RACFs cannot be understated.

Managers had crucial decisions to make regarding the safest location for residents during the pandemic. Chronically understaffed RACFs now had to face the prospect of the existing workforce contracting COVID-19 and being unable to work (McGilton et al., 2020). Managers of RACFs had very little option but to try to meet the high care needs of RACF residents with a depleting workforce. One option was to transfer residents to acute hospitals for care. There were concerns that if the only plan was to move RACF residents into the hospital system, capacity would be reached within a couple of weeks (Daly & Wearing, 2020). Additionally, Australian and international studies have revealed it is not in the best interests of RACF residents to spend time in emergency departments due to the risk of further injury, unnecessary discomfort and distress (Dwyer et al., 2014; Hullick et al., 2016; Marsden et al., 2018). This strategy would have left the vulnerable RACF resident in a dire situation, unsafe at home and unsafe in hospital, but with no alternative if the RACF could not safely manage their care.

Residential Aged Care Facilities were already grappling with systemic failures prior to the COVID-19 crisis (Davidson & Szanton, 2020). Due to the pandemic, care of the aged in RACFs has now become a public health issue (Davidson & Szanton, 2020), rather

**What does the paper contribute to the wider global clinical community?**

- Insights can be used to inform the development of strategies for RACF managers who are actively trying to manage risk and maintain communication during a pandemic
- Information to strengthen the development of policy and procedure in the areas of communication and safe practices in RACFs
- Better understanding of the current challenges in responding to the COVID-19 crisis for RACF managers to future proof facilities against new pandemics

than the sole responsibility of the RACF itself. Four public health solutions have been proposed to address the RACF systemic failures including increasing aged care funding (Werner et al., 2020); increasing staffing (Davidson & Szanton, 2020; Faghanipour et al., 2020; Gaur et al., 2020; McGilton et al., 2020); making aged care employment more attractive (McGilton et al., 2020); implementing more helpful technology (Siette et al., 2020). Together, these four solutions present a sound plan but will come at a price. For example, the expected cost of restructuring and fortifying aged care in the USA has been estimated to amount to \$US15 billion (Werner et al., 2020).

One of the potentially less expensive solutions is to consider the implementation of more helpful technology such as visual telehealth to beam expert clinical support care into RACFs. Visual telehealth is a timely and cost-effective means of providing care for RACF residents and supporting RACF staff in clinical decision-making during the COVID-19 pandemic (Davidson & Szanton, 2020; Edelman et al., 2020; Fisk et al., 2020; Gillespie et al., 2020; Hoffman et al., 2020). To date, little has been reported of the way in which pandemic preparedness affects clinical decision-making in RACFs and how visual telehealth has supported or can support this process.

In early 2020 we had commenced a large, funded study focusing on the use of visual telehealth consultation in supporting clinical care decision-making between RACFs and emergency departments. This study was temporarily suspended due to COVID-19 visitor restrictions (Sunner et al., 2020). The research team saw this temporary suspension period as a unique opportunity to engage with as many RACF managers as we could, to understand the pandemic response through their eyes. We wanted to discover what their key issues and concerns were, and to explore with them whether visual telehealth would be of assistance to them as they were preparing for and responding to COVID-19. It is important to increase understanding of the challenges faced by RACF managers in the situation of a pandemic in order to identify strategies they employed in this unique situation to future proof facilities against pandemics. Increasing understanding of their pandemic response may also identify useful



strategies they developed that may also improve current practices in RACFs.

## 2 | STUDY

### 2.1 | Aims

The study aims to understand the changing context of RACFs and the role of RACF managers in preparing to confront the COVID-19 pandemic and to provide insights into how the use of visual telehealth consultation might be incorporated to assist with managing whatever might arise.

### 2.2 | Design

A qualitative study design was employed, and data were collected using semi-structured interviews conducted via telephone or videoconferencing. Thorne's interpretive descriptive methodology was used to guide this study owing to its focus on practice to uncover what is not known about a phenomenon (Thorne, 2008). The Consolidated Criteria for Reporting Qualitative Studies (COREQ) (Tong, Sainsbury, & Craig, 2007) has been followed in reporting this study (File S1).

### 2.3 | Setting/Participants

RACFs ( $n = 100$ ) that utilised the aged care emergency service of one Local Health District (LHD) in New South Wales, Australia were targeted for this study. The RACFs were located in metropolitan, rural and remote areas. RACF managers (and relieving managers) contacted for this study were identified from a local database nominating the key managerial contact for each RACF, and/or the most senior role onsite. A purposive sample of RACF managers was selected as the most appropriate key informants as they would have the greatest organisational knowledge of the RACFs' response to COVID-19. Interviews were conducted in early 2020 when all RACFs were in varying states of lockdown that occurred towards the end of the first COVID-19 wave in Australia.

Invitations were sent via email to the managers of 100 publicly funded or privately owned RACFs within the LHD. The decision to invite 100 RACF managers to participate was a pragmatic decision based on the potential number of interviews one researcher could manage within the shortest possible timeframe in a dynamically unfolding COVID-19 situation. Twenty-eight RACF managers responded, with three RACFs electing to have more than one manager participate in the interview. Emails were resent three times, one week apart to encourage participation. This resulted in 28 individual and two group interviews (consisting of 2–3 participants), totalling 31 participants (4 male and 27 female) from 18 RACFs located in metropolitan areas and 10 from rural areas, see Table 1.

### 2.4 | Data collection

Semi-structured interviews were guided by key questions (see Table 2) exploring the participants' experiences with RACF preparation and the challenges encountered or anticipated. Interviews were conducted between May and June 2020.

Due to pandemic social distancing restrictions at the time, interviews were conducted over a secure videoconferencing platform that included a recording device. Interviews were also recorded on a digital recording device as a backup in case of equipment failure on the videoconferencing platform. Only the researcher (CS) and the consenting participant(s) were present during the interviews, which were conducted in private workplace environments at each location. One repeat interview was attended. The interviews ranged from 15 to 45 minutes in duration. Brief field notes were made by the interviewer to document key points identified in the interviews. The interview recordings were fully transcribed, and participants were offered the opportunity to receive a copy of the transcript.

### 2.5 | Ethical considerations

Ethics approval was granted by the LHD Human Research Ethics Committee, approval number 2019/ETH12853. Following approval, an information statement outlining the study purpose and a consent form were sent via the work email of the RACF managers.

RACF managers who replied to the invitation email and returned a signed consent form were sent an appointment to participate in an interview. Participation and consent were voluntary. Interviews were transcribed and the demographic details were de-identified to ensure confidentiality and each participant was allocated a pseudonym.

### 2.6 | Data analysis

NVivo software (QSR International, 1999) was used to manage the data. An inductive approach to data analysis was used according to the three steps outlined by Thorne (Thorne, 2008).

The transcripts were coded independently by three researcher's CS, VP and MG, who then collaborated in the development of representative themes (CS is a PhD in nursing student, VP and MG are experienced nurse clinicians and researchers). Open codes were developed inductively and iteratively by the three coders (CS, VP and MG) reviewing three transcripts each independently. Thorne's (2008) three-stage interpretive descriptive method of data analysis allowed the researchers to check, test, compare and contrast whole components of the data to identify differences, similarities, relationships and patterns to gain an understanding of the RACF managers' experiences responding to a COVID-19 pandemic.

Codes were further refined, and common emerging themes recognised and put through the 'thoughtful practitioner test' (Thorne, 2008, pp. 92–93), where insights from the three coders, who were

**Table 4.1**

*Demographic Characteristics of the Participants*

**Table 4.2**

*Example of Participant Interview Questions*

TABLE 1 Demographic characteristics of the participants

Number of beds in RACF	RACF	Participant Pseudonym	Rural (R)/Metropolitan (MT)	Organisation type: Single (SO)/Multiple(MO)	Government(G)/Private(P)
1–50	1	Jim	MT	MO	P
	2	Chloe	MT	MO	P
	3	Kate	MT	MO	P
	4	Frank	MT	MO	P
	5	Olivia	R	SO	G
51–100	6	Sonia	R	MO	P
	7	Louise	R	MO	P
	8	Kylie	MT	MO	P
	9	Anna	MT	MO	P
	10	Adrianna	MT	MO	P
	11	Alice	MT	MO	P
	12	Alannah	MT	MO	P
	13	Courtney	R	MO	P
	14	Claudia	MT	MO	P
	15	Esme	MT	MO	P
	16	Katherine	MT	MO	P
	16	Annabelle			
	17	Eva	R	MO	P
	18	Rachel	MT	MO	G
	18	Nicolas			
	18	Monica			
101–150	19	Alina	R	MO	P
	20	Eleanor	MT	MO	P
	21	Madison	R	MO	P
	22	Amelia	R	MO	P
	23	Brooke	MT	MO	P
	24	Ray	R	MO	P
	25	Emma	MT	MO	P
	26	Talia	MT	MO	P
151–200	27	Daniella	MT	SO	P
	28	Georgia	R	MO	P

Abbreviations: G, Government; MO, Multi-Organisation; MT, Metropolitan; P, Private; R, Rural; SO, Single Organisation.

TABLE 2 Example of participant interview questions

Interview Protocol: RACF Staff Managers
Tell me what you have in place in response to the COVID-19
What are the challenges that you foresee?
How do you think the Visual Telehealth Consultation can assist you with these challenges?
Probing questions, such as 'could you please provide an example' or 'please tell me more', were used to encourage the participants to elaborate and deepen their answers, when needed

through a process of reflection and inference to create an emerging understanding and qualitative description of participants' contributions (Sandalowski, 2010). Transcripts were then re-read several times by the researchers (CS, VP and MG) and were discussed until a consensus was reached, finally resulting in two main themes and five minor themes as outlined in Table 3.

## 2.7 | Rigour

expert experienced clinicians from three different clinical backgrounds, were able to provide rich, critical reflection on the data. The coders identified a coding tree consisting of 25 initial codes derived from the data with 11 sub-codes. Themes were then worked

Transparency and trustworthiness of the findings were ensured through; keeping an auditable record of how the findings were derived, grounding of the findings in the data and member checking (Bazeley, 2013). Credibility was assured as all interviews were

## Table 4.3

### Themes and Subthemes

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TABLE 3 Table of themes and subthemes

Theme	Subthemes	Description
Keeping people safe	1. Fear and uncertainty	Concerns related to how to keep the virus out of the RACF
	2. Managing the risks	What was done and how effective was it
	3. Retaining and recruiting staff	Problems keeping staff at work
Keeping people connected	1. Being disconnected and isolated	Alternative pathways to keep in touch with technology
	2. Embracing technology	The acceptance of telehealth and videoconferencing

conducted by CS who has interpretive authority (Thorne, 2008) and extensive experience in the aged care sector in the community and in emergency department care of the older person. At the time of the study, CS was employed as a project manager for the PACE-IT project (Sunner et al., 2020) and was closely mentored, supervised and supported by her research team, who are all experienced qualitative researchers and co-authors on this paper.

### 3 | FINDINGS

Analysis of the RACF clinical manager interviews identified two interrelated themes. Firstly, Keeping people safe, comprising three subthemes; Fear and uncertainty, Managing the risks and Retaining and recruiting staff. The second theme was Keeping people connected, comprising the following two subthemes; Being disconnected and isolated and Embracing technology. Together these themes encapsulate RACF participants shared perceptions of the changing context during the height of the COVID pandemic and highlight the complexities and the challenges associated with managing an RACF during this time.

#### 3.1 | Keeping people safe

The sudden and unheralded arrival of the COVID-19 pandemic meant that there was an imminent and urgent heightened risk for RACFs resulting in escalating fear and uncertainty. Managers were confronted and challenged by a situation that they had not previously encountered and the path ahead for them was not clear.

In keeping people safe, there were three subthemes identified; Fear and uncertainty, Managing the risk and Retaining and recruiting staff.

##### 3.1.1 | Fear and uncertainty

In the context of COVID-19, participants were concerned that staff were unwittingly bringing the virus into the RACF and also taking it home, potentially exposing residents and their families to harm, as Chloe expressed;

A lot of the staff are saying, the hardest thing is the thought that we might actually be a carrier and not know

(Chloe)

All participants described a perception that staff felt they were in some sort of danger, verbalising that they were also personally feeling nervous, frightened, fearful and scared. Two participants described staff's concerns in the following way;

...they have two fears, bringing the virus in and taking the virus out

(Katherine)

... with the media, I think you know with what's been happening in other facilities that makes everybody quite sort of 'on edge', feeling a little bit stressed about it all

(Amelia)

Participants said staff told them that they were worried about the transmission of COVID-19 amongst themselves, as many were in a *high-risk age group* with co-morbidities. Staff were also concerned for their vulnerable older parents at home and for other members of their family. Amelia shared her view;

I think it just makes everybody feel really nervous about you know what potentially can happen in an aged care facility if there was an outbreak

(Amelia)

The uncertainty of the rapidly unfolding situation was exemplified in the following comment;

... oh gosh, am I going to have to stay here, am I going to be able to go home, you know like if you got an outbreak here, you know you might be stuck and stay here with the residents at night ... there was a lot of fear of the unknown, of what could happen

(Amelia)

Whilst all attempts were made to connect residents and families via tele-communication platforms, families still insisted that they visit the RACF face to face, which put unexpected pressure on staff who had to enforce COVID-19 safe company and government regulations. Lockdown of facilities was adopted to keep residents safe. However, participants described how some residents' families were unreasonable, aggressive and unsympathetic to the rules, with reactions that ranged from verbal outbursts and written complaints to trying to sneak into the facility. One manager (Olivia) was called to diffuse a difficult situation with a relative;

They're getting really shirty (sic) with me because I won't let them in with a four-month-old baby, and the five year old who's got a cold

(Olivia)

Several participants shared the view that visitors and families were 'untrustworthy'. Courtney provided an example where a relative had disembarked from a cruise ship (a major source of COVID-19 infections in Australia) and immediately visited her mother in the RACF. Daniella spoke about how a concerned community member notified the RACF that the relative who visited had contracted COVID-19, but did not report it to the RACF;

That's our biggest risk, is that people don't tell us the truth. They'll want to come and see their mum because they think that's okay, and not appreciating that in communal living, (then) there's a whole other layer of risks

(Daniella)

### 3.1.2 | Managing the risks

The heightened awareness of potential risk for residents and staff meant that facilities had to rapidly implement ways of managing / negating these risks. Engaging in proactive practices to prepare for a pandemic including procuring PPE supplies, surging the workforce, developing audit tools and guidelines were identified by participants as key strategies to overcome the challenges and keeping residents safe. However, approaches were inconsistent across sites with the inability of some facilities to fully implement plans. Some participants were worried about how they would source PPE with national distributors running low and organisations beginning to stockpile equipment.

Larger organisations were lucky enough to organise 'hubs' within two hours so RACFS would have whatever they needed in an outbreak. A manager said her company went to great lengths to obtain stock from overseas,

they did actually hire a plane, and they went overseas and got stuff and brought it back

(Adrianna)

With one RACFs resorting to sourcing PPE supplies at the local hardware store or online.

Supplementary workforces were suggested as a strategy to combat the workforce shortfalls in the event that RACFs were overwhelmed with COVID-19 cases however recruitment was were largely unsuccessful, as Courtney reflected;

... if we do have a COVID outbreak somewhere else, no-one's volunteering

(Courtney)

One manager mentioned that the corporation's preparedness plan was to transfer any resident with COVID-19 to the nearest public hospital. Some RACFS developed self-audit tools to measure how prepared they would be and there were newly written manuals and updated guidelines provided. Some companies had the luxury of appointing additional staff specifically to filter through large amounts of new information, yet others struggled to adequately staff facilities, with no dedicated time to catch up on all the information that was being disseminated. A candid admission by Olivia explaining the information overload experienced with COVID-19 policy/guideline was as follows;

It's a huge document. I still haven't worked my way through the whole thing. It's me, basically. We're a 31-bed facility and I'm the only RN here at the moment

(Olivia)

Most participants were certain that they would not be ready to tackle an outbreak, even with proactive planning, due to the lack of available staff, reflected in Ray's remark;

I don't know if you'll ever truly be ready for this stuff, I think because there's so many unknown's and twists that you get in the middle of it all

(Ray)

Many participants felt that they were fortunate to be in a privileged position, and that they had 'gotten off lightly', and they were able to learn from other sites who were tackling a COVID-19 outbreak. Anna comments;

... the benefit of watching other places go through horrendous times...that's a very fortunate position to be in, to their credit they have been the teachers

(Anna)

### 3.1.3 | Retaining and recruiting staff

Maintaining adequate staffing levels was at the forefront of all participant's concerns. Many participants acknowledged that rostering was a constant challenge even prior to COVID-19, citing 'burnout' as the root cause of lack of staff in aged care generally. This workforce challenge related to all levels of staff, from managers through to support staff.



Difficulties with filling the roster and retaining staff during COVID-19 was amplified through loss of staff when the facility had a COVID-19 outbreak. One participant reported that they were only be left with five staff to care for 100 residents, a ratio of 1:20.

Georgia and her team were so fearful of losing staff to extended sick leave or forced isolation due to COVID-19 that they went through a hiring process to get extra staff on board. At the time of the interview, many participants reported that they already had staff on leave due to COVID-19 testing, and in isolation awaiting results. Sonia sums up these concerns;

I was really a little bit panicky for a little while because I was making up all these scenarios in my head about what if a lot of staff have to be tested or the community gets it more and I'm losing 50% of my staff. And how am I going to replace them? Like how will it all work? As a manager, that was my biggest worry, losing the staff, which thank goodness it hasn't happened, but obviously it could have happened. That's a big worry because in the end... you can't potentially replace them

(Sonia)

In addition to the mandated sick leave staff had to take whilst awaiting COVID-19 test results, participants reported other reasons for depleted staff numbers. Three reasons identified were exhaustion, being in a high-risk group, or just staff resigning. Recruiting into an environment that is already under strain and close scrutiny, posed further potential challenges for managers.

### 3.2 | Keeping people connected

Managers were dealing with fear from staff residents and families, residents wanting to see their loved ones but being isolated from them, so managers had to think about how they could use technology to assist them addressing this. The second theme is Keeping people connected, consisting of two subthemes; Being disconnected and isolated and Embracing technology.

#### 3.2.1 | Being disconnected and isolated

Some participants voiced concern about the disconnection that the mandated 14-day isolation caused for a resident's mental health. For example, Chloe told of the following situation;

We had one lady who did go to hospital a couple of weeks ago and she does suffer from mental health problems and I was quite concerned about her being in her room because she didn't want to get out of bed and it took a few days before she would allow the staff to actually get her up and, "come on let's get you in a

chair, let's get you", you know, and sort of perk her up and she's out of her room now and she's really happy but, you know, just the mental challenge for that

(Chloe)

Eleanor described the exposure risk for a resident who required unavoidable, constant isolation due to regular off-site appointments for dialysis;

... we have a gentleman who has dialysis, so he's going to have dialysis two times a week. He's an insulin-dependent diabetic. He also has got issues with his mobility and his weight and he is a bariatric person. So, there's a lot of issues that would affect him if he got COVID

(Eleanor)

Some participants believed this isolation was associated with the development of mental health issues such as depression, and increased episodes of *psychological decline, aggression, or some residents just appeared to be 'mentally struggling'*. One participant observed that isolation proved too much for some, and they had five residents die in a month, whereas normally only five residents would die in a year. The participant's reflected on the effect of isolation on the residents, saying that they;

(residents)...died of worry (Alina) or [had] given up

(Katherine)

Several participants considered that residents with varying cognitive levels became more withdrawn because families no longer visited them due to the lockdown requirement. A participant described the impact that no family visits has on residents with dementia;

They don't understand why. They get down, they've potentially given up, I think it would have a tremendous impact

(Esme)

Some participants voiced concerns that a further contribution to resident's withdrawal was that the usual conversations with staff were from behind a mask, gown and gloves and conversations were few and far between.

They can become quite depressed if they're stuck in their room on their own, everyone's got to mask up and gown and gloves, you know so ...

(Chloe)

Many residents experienced a lack of any human contact or mental stimulation. There was debate about the availability of formal mental health care for residents, with participants very clear that help was not readily available due to staffing and funding constraints.

### 3.2.2 | Embracing technology

There were varying degrees of experience with technology and varying levels of confidence and capability across the different sites. The majority of RACFs had various tele-conferencing/telehealth platforms connecting residents and families, allied health and/or GPs, finding it essential to keep communication pathways open. Some participants spoke of utilising new staff positions and roles, specifically aimed at connecting residents, their families and healthcare providers.

So my lifestyle coordinator's become a bit of a 'Zoom' champion

(Tahlia)

Many allied health, physiotherapists, occupational therapists, dietitians, nurse practitioners, geriatricians and speech therapists embraced telehealth by either instructing staff or consulting with the resident directly via visual telehealth consultations.

We've actually got all the physios on Telehealth and our health assistant goes around and does the exercises with them instead of the physio

(Alina)

It was noted that the use of telehealth was now more widely accepted amongst the residents when they were talking to the GP or family via video technology. Several participants reported the resident's response to the use of telehealth as;

We have one lady, she's 103 and we tried to explain to her that she would be able to talk to people on this funny looking thing and she said 'I really didn't think I'd be able to say anything, I thought I'd clam up, but once I got on I couldn't shut up' she said. 'I couldn't stop talking'

(Eva)

Participants also reported far greater acceptance of telehealth use by themselves and the staff, and the many benefits that had been realised;

I love telehealth ... I'm quite happy to keep everyone out of here and dial in to everyone, it'd be great. (Good assistance with) Supra public catheter reinsertion

(Courtney)

Used with a PEG (percutaneous endoscopic gastrostomy) tube it would have been good to talk through that... the resident had to go to hospital

(Alannah)

The benefits of using telehealth for residents included the reduction in transport to another facility for consultation or treatment and

associated costs, assistance in attending difficult clinical procedures, outpatient appointments, educational webinars and videoconferencing for staff meetings. As Tahlia states;

Transport costs to get our residents to and from an appointment is difficult, in particular, a lot of my residents don't like to leave the building, with the dementia, or if we get them out, we can't get them back in. So, I think telehealth has a potential to be very useful in behavioural concerns (when) we can't get them to leave the building

(Tahlia)

Despite varying experiences, some participants spoke of their facilities embracing visual technology and telehealth as a communication tool and had committed to further acquisition of iPads/tablets;

Previously we didn't have anything and now we have seven iPads

(Ray)

Most participants reported that uptake of telehealth by GPs varied considerably, ranging from zero use to highly prepared and proficient. The GP is the primary healthcare provider for RACF residents requiring face to face healthcare delivery. However, face to face visits from GPs exposed the resident to increased risk. Some GPs were still operating private GP practices, seeing many patients who may be unwell, visiting other RACFs or having to be in isolation themselves. For example, Amelia described a situation where;

one of the other GPs had been to Pakistan and of course then had to have 2 weeks of isolation and I don't think he is back at work or I am not quite sure what's happening ... so that's definitely been a challenge

(Amelia)

Participants reported that the facility used telehealth as an alternative to face to face visits, using a variety of different platforms, and that this raised data security and privacy issues.

I think one's using Facetime, which is a bit strange, because they won't send anything via email because of [security] things, but they're using Facetime to do their Telehealth

(Amelia)

The decision to use telehealth was often driven by the GP. However, some GPs did not attempt to adopt telehealth at all, and in fact reduced their contact, opting for no visits or just telephone calls.

GPs were providing wound advice consultations based on emailed photographs and a telephone call. Others physically

visited the RACF but did not personally visit or view the resident. Participants shared their experiences of GPs who really '*stepped up to the mark*' by ensuring residents were able to avoid hospitalisation with the adoption of telehealth or by increased telephone consultations. One participant spoke of a particular GP who engaged fully with visual telehealth consultation, doing a weekly round for all her residents;

We embraced Zoom which was wonderful, so with her iPad and my iPad we could walk round the facility...and she could actually talk to her residents

(Brooke)

In contrast, some participants voiced their frustration that several GPs had not adjusted their communication techniques at all, continuing to telephone as they usually would.

The use of telehealth appeared to have a good level of acceptability and the rate at which it was being embraced differed throughout the participant's facilities. However, the common thread was that it was a useful tool to address the communication restrictions thrust upon RACFs in the time of COVID-19.

#### 4 | DISCUSSION

The events that unfolded following the completion of this study in March 2020 were unprecedented in Australia and the world. The many fears and concerns that managers in this study were experiencing became reality for some. The pandemic had devastating effects for many families, residents and RACFs, and it would be remiss not to acknowledge this fact.

This study provided valuable insights in the COVID-19 preparations and response of RACF managers during the first wave of COVID-19 in Australia. Given the unprecedented times currently being experienced and the heightened vulnerability of older people, it was not surprising that the study findings highlight the need for RACFs to rapidly evolve new processes aimed at 'keeping people safe'. One of those processes is lock-down, a term commonly used when referring to one of the more extreme measures most RACFs have implemented to keep the residents and staff safe. As a result, many residents were isolated from the outside world and their loved ones. In some instances, residents at end of life were prevented from seeing their families in person. This forced isolation has negative mental health consequences (D'Adamo et al., 2020; Siette et al., 2020) and intensifies the need for 'keeping people connected' with the outside world and their loved ones. Keeping this connection was identified by participants as an important component of quality care provision for residents. Keeping people safe and keeping people connected were the two major themes in this study.

The study findings resonate with global literature about the chronic shortage of staff in RACFs, even prior to COVID-19. Maintaining a safe level of staffing in RACFs was a major challenge for RACF managers during ordinary times (Quigley et al., 2020; Royal

Commission, 2011). During COVID-19 staff shortages have been exacerbated, with already struggling RACFs losing some of the staff to illness, burnout or mandatory quarantine during the pandemic. Some workers have left the job due to unsafe working conditions (Faghanipour et al., 2020), leaving RACFs critically understaffed and unable to deal with the increased needs of residents (Quigley et al., 2020). The recent inquiry into Aged Care Quality and Safety identified limited provision of staff training opportunities and insufficient information to support staff to do their job effectively, leading to significant staff knowledge gaps about common aged care complaints such as continence, wound care and nutrition (Royal Commission, 2020). The pressure of managing a potential outbreak of COVID-19 in a RACF added substantial stress to an already stretched and under-skilled aged care sector.

Participants expressed mixed feelings when asked if they were prepared for a pandemic. Some were not overly confident that the measures put in place were adequate. Year after year RACFs have constant threats of influenza and gastroenteritis, potential viral threats such as SARS or MERS, yet outbreak management plans continue to be poorly developed. The lessons learned about pandemic preparedness for the SARS or MERS outbreaks for example seem to have been ignored or forgotten (Donnelly, 2020). Aged care authorities believe emphasis should be placed on addressing these issues immediately, in order to build a more robust, flexible, healthcare system for vulnerable older people and implement learnings from this COVID-19 pandemic (Siette et al., 2020).

Participants were concerned that whilst attempting to keep residents safe they may have been causing them harm. The risk visitors posed for residents in unwittingly transporting the virus into the RACF was a major concern for participants. There were stricter lockdown directives for older people, generally with the media continuing to report that older people have much poorer outcomes if they contract the virus (Morrow-Howell et al., 2020). Some participants conveyed their concerns that the fear in some residents was so great that they just gave up. Lockdown for some RACFs meant that visitors were stopped, inadvertently severing an important social lifeline for residents. This isolation left older people more vulnerable and without a trusted advocate (Faghanipour et al., 2020). Residents in RACFs are particularly vulnerable to social isolation, and there is emerging evidence about the detrimental effects on their physical and mental health (Brooke & Jackson, 2020; D'Adamo et al., 2020; Morrow-Howell et al., 2020; Siette et al., 2020).

Older people in our society have a right to safe quality care and RACFs need to have support to be able to deliver this. Telehealth addresses a significant gap in care for RACF residents that will keep them safe in their home, prevent their exposure to potentially deadly pathogens and allow staff to receive quality clinical advice and support with decision-making. However, Telehealth uptake requires significant changes in management effort and redesign of existing models of care. Firstly, implementing telehealth proactively rather than reactively is more likely to generate greater benefits in the long term, and help with the everyday and emergency challenges in health care (Smith et al., 2020). Secondly, there is an urgent need



for rapid and sustained public health interventions (McMichael et al., 2020) linking residents with modern communication technology and staff to support them (Siette et al., 2020). Finally, research should also focus on evaluating the effectiveness of different technologies and policies used to inform future pandemics (Siette et al., 2020) and apply this knowledge. Visual telehealth technology, which is a key component of the model of care being implemented in the larger study (Sunner, 2020), has shown that it can support RACFs in many ways and was highlighted in the two major themes; keeping people safe and connected.

## 5 | STRENGTHS AND LIMITATIONS

The strength of this study is that it was undertaken in real time as RACF managers confronted a major threat to the health of residents and staff due to the COVID-19 pandemic. They generously gave of their time to participate in this study in order to share their experiences and solutions with other RACF managers who found themselves in similar situations. However, the findings from this study may not be transferable to RACFs in other areas of Australia or internationally as the RACF challenges and responses were context specific, and significant differences in the severity of the COVID event across facilities. It is important to acknowledge that there was a time constraint to undertake the interviews in the peak of the first wave of COVID-19 to understand managers' experiences in real time.

## 6 | CONCLUSION

These unprecedented times have identified a gap in the aged care sector in terms of protection of vulnerable residential aged care residents. COVID-19 has highlighted the urgent need for better planning and management. Findings from this study provide valuable insight into the most pressing challenges for RACFs and the staff as they attempt to keep the residents safe and alive, maintain and upskill the workforce, keep up with rapidly generated guidelines and introduce new technologies to keep the residents connected with healthcare providers and the outside world.

## 7 | RELEVANCE TO CLINICAL PRACTICE

Understanding the experiences of RACF staff and residents during the COVID-19 will assist facility managers and policymakers effectively plan, develop and implement strategies to overcome many of the challenges identified. Findings from this study identify a clear need for further support RACFs during the pandemic and beyond. Better awareness by external governing bodies will assist in managing future pandemic responses in RACFs and contribute to keeping these vulnerable Australians safe. In addition, telehealth has been identified as a useful strategy to overcome many of the challenges RACFs experienced during pandemic lockdown.

## ACKNOWLEDGEMENTS

We would like to thank the RACF managers who participated willingly in this study. They gave up their time to share their stories during a stressful and prominent time in global history.

## CONFLICT OF INTEREST

No conflict of interest has been declared by the authors.

## AUTHOR CONTRIBUTIONS

CS, MF and MG contributed to developing the research concept, and CS, MG, MF and AK contributed to the design and method development. CS, MG and VP contributed to the coding and thematic analysis of participant transcripts. CS developed the initial draft of the paper, with significant input from MG and MF. The final draft was significantly and critically revised for relative scientific content by MG, MF, VP and AK. All authors approved the final versions of the manuscript. All authors agree to the content of this paper and were involved in writing and revising this manuscript.

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## SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section.

**How to cite this article:** Sunner, C., Giles, M. T., Parker, V., Kable, A., & Foureur, M. (2021). COVID-19 preparedness in aged care: A qualitative study exploring residential aged care facility managers experiences planning for a pandemic. *Journal of Clinical Nursing*, 00, 1–11. <https://doi.org/10.1111/jocn.15941>

### **4.3 Summary**

In this chapter the methodology and methods of the COVID-19 preparedness study have been detailed. The findings from this study highlighted the challenges RACF managers faced when trying to keep RACF residents safe from COVID-19. From this study valuable insights were provided into the need for better pandemic planning and management, upskilling nurses and workforce contingency for RACFs. In this study it was identified that including VTC can be a useful MOC place to overcome pandemic lockdown challenges. In the next chapter the perspectives and experiences of ASET nurses in RACF and ED nurses using VTC through focus groups are explored.

## **Chapter 5: A qualitative descriptive study**

In this chapter the perspectives and experiences of the nurses working in RACFs and EDs utilising VTC to assess the need for RACF-resident transfers to the ED are explored. In this chapter, the RACF and ASET nurses that implemented and experienced VTC in their workplaces were recruited to discuss their encounters in focus groups. These focus groups were held three months after the last PACE-IT implementation session in February 2021. The focus groups were facilitated by Professor Maralyn Foureur and the interview schedule generated many discussions. The findings are presented in the following publication. The candidate was not employed as an ASET nurse during the research and did not conduct the focus groups, however the candidate's previous experience of in this role brings crucial understanding to the clinical workings of the ACE service in ED.

## 5.1 Experiences of visual telehealth consultation

Received: 9 March 2022 | Revised: 12 August 2022 | Accepted: 14 August 2022  
DOI: 10.1111/jocn.16529

ORIGINAL ARTICLE

Journal of  
Clinical Nursing WILEY

### Experiences of nurses working in RACFs and EDs utilising visual telehealth consultation to assess the need for RACF resident transfer to ED: A qualitative descriptive study

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#### Funding information

Ministry of Health, New South Wales  
Government, Grant/Award Number:  
Translational Research Grant Scheme  
H19/53776

#### Abstract

**Aims and objectives:** This study aimed to explore whether an intervention using visual telehealth improves care outcomes for residents in residential aged care facilities during acute illness events from the perspective of the nurses from residential aged care facilities and emergency departments. The intervention was the addition of visual telehealth, to an already existing outreach service called Aged Care Emergency.

**Background:** Older people who are residents of residential aged care facilities commonly experience potentially avoidable visits and hospitalisations. Adopting visual telehealth or telemedicine has emerged as a care transition solution across several domains in health care, including residential aged care.

**Method:** This study used an interpretive descriptive methodological approach and was part of a larger study called the PACE-IT project that implemented a visual telehealth assisted model of care in four emergency departments and 16 residential aged care facilities to prevent unnecessary resident presentations to emergency departments. We report findings from six focus groups that explored key issues relating to the experiences of emergency department and residential aged care nurses who participated in the PACE-IT project. This study adhered to COREQ research guidelines.

**Results:** There were four overarching themes that emerged from the six focus groups; facilitated person centred care; built confidence, relationships and trust; enabled bi-directional communication that strengthens decision making, but there were issues with technology access, connectivity and usability between the acute care setting and the residential aged care facility.

**Relevance to clinical practice:** Understanding the experiences of residential aged care facility and emergency nurses' experiences when using visual telehealth will better inform practice development in aged care, in particular enhancing decision making and increasing safe practices using telehealth. The knowledge gained in this study in terms of enhanced assessments for residents will provide policy makers with valuable insights for future health care planning and implementation of telehealth.

**Trial registration:** ACTRN12619001692123.

**KEYWORDS**

communication, emergency care, emergency department, nursing homes, older people, patient safety, patient-centred care, qualitative study, telenursing

**1 | INTRODUCTION AND BACKGROUND**

Older people who are residents of residential aged care facilities (RACF) commonly experience potentially avoidable emergency department (ED) visits and hospitalisations (Ouslander et al., 2010). Older residents are also exposed to unanticipated adverse consequences from a visit to ED, including pressure injuries, delirium, falls, nosocomial infections, medication errors and potentially unnecessary invasive interventions, even death (Dwyer et al., 2014). RACF residents are large users of emergency care resources, with higher rates of ambulance transport, diagnostic testing, imaging and procedures and longer ED length of stay (Wang et al., 2011).

Residents of RACFs commonly undergo burdensome and potentially preventable care transitions for symptoms or conditions, such as pneumonia, urinary tract infections, and dehydration, that could be safely and effectively treated in the RACF setting (Walsh et al., 2012). The potential benefit of reducing inappropriate ED transfers for RACF residents is that it does reduce harm and complications resulting from medical treatment, improving outcomes and quality of care (Burke et al., 2015; Stephens et al., 2019; Walsh et al., 2012). This is a high priority for residents, families, RACFs and health systems (Stephens et al., 2019).

Experienced RACF nurses are essential in RACFs as residents often have multiple chronic conditions, high medical acuity (Wang et al., 2011) and are clinically challenging due to the level of complexity in the care that they need (McGilton et al., 2020). Unfortunately, the aged care sector struggles to attract experienced nurses. RACF nurses rely on the General Practitioner (GP) to assist them in an emergency, but GPs are not always readily available. The GP, the primary health care provider for residents in RACFs, often struggle with competing high workloads from their private practices (Ohlrigs et al., 2020). Comprehensive general medical care is crucial for older people in RACFs as not all health events are emergencies (Ohlrigs et al., 2020). However, in the absence of the GP, the RACF nurse often opts for the ED as an escalation point for the resident's care.

The adoption of visual telehealth consultation (VTC) or visual telemedicine has emerged as a care transition solution across several domains in health care, including RACF care. VTC is the secure transmission of images, voice and data between two or more units via telecommunication channels producing a visual connection. VTC has the potential to save significant health care costs when used to assist a care provider outside the RACF, to ask appropriate questions and carry out a thorough assessment (Grabowski & O'Malley, 2014; Hex et al., 2015; Hofmeyer et al., 2016). VTC has also been reported to generate high RACF resident satisfaction and acceptability (Chan et al., 2001; Chess et al., 2018; Prandi et al., 2020). Further, including the resident in the VTC discussion provides further clarity for health professionals and the resident in the decision-making process (Catic

**What does this paper contribute to the wider global clinical community?**

- The use of visual telehealth enhances trust between emergency department staff and residential aged care nurses, which in turn may improve communication and decision making associated with transfer of residents to emergency departments.
- Visual telehealth enhances learning opportunities for residential aged care facility nurses that may improve the care and experiences of residents.
- The inclusion of visual telehealth may improve safety for the large population of vulnerable people in residential aged care facilities, particularly during a pandemic with the addition of visual assessment during consultations.

et al., 2017; Chess et al., 2018; Stephens et al., 2019). Providing expert clinical advice to RACF nurses remotely via VTC is an economical and safe way of providing a viable alternative to a hospital presentation (Joseph et al., 2020).

For the purpose of this paper, we refer to any interaction that uses real-time visual assessment consultation as VTC, including telemedicine. VTC fits with the definition from the International Organisation for Standardisation that defines Telehealth as the "use of telecommunication techniques for the purpose of providing telemedicine, medical education, and health education over a distance" (International Organization for Standardization, 2021). VTC can potentially enhance access to clinical expertise and support for RACF nurses by improving communication with the RACF and the ED. Although VTC has been trialled in many different RACF settings over the last few decades, it has not readily been adopted as part of daily routine in healthcare (Zanaboni & Lettieri, 2011).

Currently, there are outreach services that are designed to assist RACFs with decision making using phone consultation or face to face visits to the RACF. One of these services, Aged Care Emergency (ACE) provides RACF nurses with support from ED nurses (with advanced aged care knowledge), to discuss any unwell resident, and together they formulate a management plan. In NSW, this role is mostly facilitated by nurses from the Aged Care Service in Emergency Team (ASET), a position based in the ED. However, ACE is limited to phone consultations only. A large Australian study called the Partnerships in Aged Care Emergency using Interactive Telehealth (PACE-IT) (Sunner et al., 2020) implemented a Model of Care (MoC) to augment the ACE service by adding vision to telehealth as part of the assessment and planning process. The Aged Care Emergency (ACE) service encourages



RACF nurses to utilise a structured clinical communication process via ISBAR (Identify, Situation, Background, Assessment, and Recommendation) (Clinical Excellence Commission [CEC], 2021), including identification of clear goals of care, to potentially avoid the need to transfer a resident to an ED.

The authors have been unable to locate other studies reporting how the use of a VTC can enhance decision making with nurse-led outreach services from ED. This paper presents the qualitative component of the PACE-IT study (Sunner et al., 2020), where the experiences of ED and RACF nurses utilising the VTC MoC were explored, and in particular, barriers and enablers to uptake and sustainability were identified. The study also investigated whether VTC is an acceptable way to address decision making and whether it contributes to improved outcomes. Furthermore, the study sought to understand if supportive collaborations with clinical staff and RACF nurses using VTC enhanced access to teaching and learning, knowledge and skill development.

## 2 | STUDY DESIGN AND METHODS

This paper describes the experiences of nurses who participated in the PACE-IT project. The aim of the study was to explore whether an intervention using visual telehealth, improves care outcomes for residents in residential aged care facilities during acute illness events from the perspective of the nurses from residential aged care facilities and emergency departments.

The PACE-IT project implemented a visual telehealth assisted model of care in four EDs and 16 RACFs designed to prevent unnecessary presentations to ED by RACF residents. This paper reports findings of a qualitative component of the PACE-IT study in which data were collected from six focus groups which explored key issues relating to the experiences of ED and RACF nurses who participated in the PACE-IT project. To ensure clarity and understanding of this study, we present it using three domains: (1) Research team and reflexivity, (2) study design and (3) data analysis and reporting, as per the COREQ (CONsolidated criteria for REporting Qualitative research) guidelines (Tong et al., 2007) (See Supplementary file 1). This study received ethical approval 2019/ETH12853.

### 2.1 | Personal characteristics of the research team

The focus groups were conducted by interviewer (MF) with the support of a research assistant, present to take field notes and observations of the participants. The interviewer at the time of the study was employed as a Professor of Nursing and Midwifery Research for one of the New South Wales Local Health Districts (LHD), Australia.

### 2.2 | Relationship with participants

The interviewer did not know the participants prior to the focus groups. The participants were told that the interviewer had an

interest in facilitating the focus groups as she is part of the research team and was best placed to conduct the interviews due to her range of research expertise, particularly in conducting clinical trials, and was not directly involved with the implementation of the project. The interviewer had no prior experience of working in either Residential Aged Care or Emergency Departments so had no assumptions about what the participants might reveal.

### 2.3 | Methodology

Interpretive descriptive methodology was used to guide this component of the study owing to its focus on practice to uncover what is not known about a phenomenon (Thorne, 2016). Adopting interpretive descriptive methodology allows for a deeper understanding and knowing of the participants' experiences in caring for RACF residents when they are unwell.

### 2.4 | Participant selection

We recruited individuals from two groups, namely: RACF nurses and ED nurses. The inclusion criteria for participation in the focus groups RACF or ED nurses were as follows; currently employed at one of the participating 16 RACFs or four EDs and had participated in a PACE-IT VTC call. They were purposively recruited, reflecting a diverse group in terms of skill level, professional experience and project implementation (Patton, 2002). There was a total of 45 RACF nurses that participated in telehealth during the PACE-IT study. We provided a list of the names to the RACF managers and received 19 responses on behalf of 19 RACF nurses with willingness to participate in a focus group. All the RACF nurses were emailed an invitation to participate in a focus group to be conducted on a mutually agreed and convenient date and time. It was decided by the research team that the RACF nurses focus groups would be held onsite at their work venue and for the ED nurses via video conferencing, e.g., Zoom. This would be the most pragmatic approach due to geographic and time constraints for the nurses if they had to travel. Participation was voluntary, and an information statement and consent form were sent to all participants and consent was signed prior to commencement of the focus groups. Nurses were excluded if they had not attended a VTC.

The ED nurses participated in one of two focus groups. Participation was voluntary, and potential ED focus group participants ( $n = 12$ ) were emailed an invitation consisting of an information statement and consent form with a choice of two dates. Consent was signed prior to commencement of the focus groups. ED nurses that participated ( $n = 6$ ) had been in their roles between three months and 11 years, and all participants had been nursing in a clinical setting for more than five years, with a variety of classifications in advanced care, clinical nurse specialist or clinical nurse consultant roles. Table 1 describes the characteristics of the study participants.

Table 5.1

*Characteristics of the Six Focus Groups*

TABLE 1 Characteristics of the participants in six focus groups

Characteristics	<sup>a</sup> EDFG 1: ED nurses N = 4	EDFG 2: ED nurses N = 2	<sup>a</sup> RFG 1: RACF nurses N = 7	RFG 2: RACF nurses N = 5	RFG 3: RACF nurses N = 5	RFG 4: RACF nurses N = 2
Location of work unit	Urban/Rural	Urban	Urban	Urban	Urban	Rural
Care providers role	Nurses that answer the ACE phone in ED		Care coordination for the residents living in an RACF			
Gender	3 (F)	2 (F)	6 (F)	3 (F)	5 (F)	2 (F)
Age years	40–50y	30–>60y	Not available			
English first language	All	All	1	4	4	1
Time worked in unit	3 m–18 m	3–11y	Not available			
Years of experience	>5 y	>5 y	Not available			

<sup>a</sup>EDFG Emergency Department nurse focus group, RFG RACF nurse focus group.

## 2.5 | Setting

RACFs ( $n = 16$ ) that utilised the aged care emergency service of one Local Health District (LHD) in New South Wales, Australia, were targeted for this study. The two participating LHDs and the RACFs consisted of both rural and metropolitan locations, please refer to Table 1.

## 2.6 | Data collection

Each RACF focus group was conducted face to face in a group setting, in a private room in their own RACF workplace facility. It is common to have studies take place in the natural context in interpretive descriptive study (Thorne, 2016), which in itself poses unique challenges. Unfortunately, the ED staff had to be interviewed via video-conference; however, this was either located in a private room in the ED or their own home. The interviewer and the research assistant present at the focus groups, took the time to establish relationships with the participants. They ensured participants were comfortable and felt emotionally safe.

The focus group semi-structured questions were guided by key questions and prompts (see Table 2) exploring the participants' experiences of using telehealth, from the different perspectives of RACF nurses and ED nurses. During these group interactions all participants were allowed a chance to voice an opinion. Attention was given to nondominant participants opinions to ensure they were not obscured and to capitalise on the broader understanding from the group. The term VTC was used to describe the communication between ED and RACF nurses and the residents, who could visualise each other and communicate in real time via an iPad, computer with a camera, or handheld device. Questions also explored the barriers and enablers to VTC use and the acceptability of the PACE-IT MoC. The questions, (refer to Table 2) were pilot tested with the research team for face validity and rigour prior to their use. The interview protocol was based on the Evaluation Resource Guide for Allied Health Telehealth (QueenslandHealth, 2016, p. 23).

The video-conference meetings were recorded via the video-conferencing platform and on two digital audio recorders (one for back up). The face-to-face focus groups were recorded by digital audio recorders only. A research assistant was present to ensure all participants had read, signed and understood the consent forms. The focus groups were between 25 and 60min in length, giving all participants an opportunity to discuss their experiences.

When the fourth RACF focus group was completed, the research team discussed the findings and found that collecting more data would not add additional understanding to the subject, therefore further focus groups were not warranted. This was a similar approach with the ED nurse focus groups. Data saturation was achieved when the researchers (MF, CS, MG) discussed and agreed that no additional codes were revealed from the focus groups. The interview recordings were fully transcribed, and participants were offered the opportunity to receive a copy of the transcript at their request, however, no participants provided feedback on the data.

## 2.7 | Data analysis

Thorne (2016) interpretive descriptive method of data analysis allowed the researchers to check, test, compare, and contrast whole components of the data. See Figure 1 that outlines the steps taken in this study's analysis process. The four conceptualisations for interpretive description to occur requires; knowing your data (comprehending), transferring patterns into findings (synthesising), engaging the critic (theorising) and placing the findings into other settings (recontextualising) (Thorne, 2016). This allowed identification of differences, similarities, relationships and patterns to gain an understanding of the ED and RACF nurses' experiences and acceptability of VTC for the residents of RACFs. NVivo software (QSR International, 2020) was used to manage the data and to derive themes. Derived themes, categories and codes are presented in Table 3.

**Table 5.2**

*Nurses' Focus Group Interview Questions*

TABLE 2 Nurses focus group interview questions

<b>PACE-IT MoC research project post implementation focus group protocol</b>
Can you tell us about your experience of participating in the VTC ACE call?
<b>Access</b>
Describe the accessibility of the VTC technology when undertaking the ACE consultation
<b>Safety and quality</b>
Do you have any concerns about your participation with the VTC ACE call, or for RACF nurses or residents? What are they?
<b>Health outcomes</b>
Do you feel that this VTC ACE call process has benefited the resident? (person-centered care, patient safety). If so, how? (give an example)
Can you outline any other benefits that might be gained for those participating in the VTC ACE process (includes RACF nurses, ED nurses and residents)?
<b>Acceptability, appropriateness and adoption</b>
In your experience of using ACE can you give some examples of how you think VTC has enhanced the assessment and decision making compared to the phone call only?
In your experience, when have you made a decision that VTC would not be appropriate and why?
Are there any instances where VTC could have been used but was not (missed opportunities) and what were the reasons?
<b>Technology and functionality</b>
What method of training was most useful for you?
What was your experience from a technology perspective, of using VTC? Can you give some good and bad examples related to the use of the technology?
<b>Efficiency and service outputs</b>
What do you see as the most challenging issues for you in using the VTC ACE call process?
What has been the feedback from others regarding VTC ACE calls? (ED nurses, RACF nurses and resident and family)

### 3 | TRUSTWORTHINESS

Lincoln and Guba (1986) created stringent criteria in qualitative research, using concepts as credibility, dependability, confirmability and transferability to demonstrate trustworthiness. To further apply rigour to this study we addressed the criteria as described by Shenton (2004). The strategies used to achieve credibility in this study included a variety of perspectives for the findings: specifically, participants were from rural and metropolitan settings, aged groups, clinical skill levels and demographics. Furthermore, the interviewer was a very experienced researcher with a PhD who had has over 30 years of experience conducting focus groups and individual interviews with research participants and research appraisal, an essential component of rigour and credibility in this study (Patton, 2002). Observation, note-taking, and journaling was recorded throughout

the research process providing additional data along with a peer review of data analysis of emergent themes also contributed to the credibility and dependability of the findings. Codes were documented clearly to keep records of data and establish an audit trail. All authors have continuously and jointly examined and considered to avoid that preinterpretation may have affected the findings. Confirmability was evident in the conclusions and interpretations and illustrated by the findings that exhibited rich quotes from the focus group participants documented in each theme. Lastly, potential transferability of this research might be considered based on the description of the study setting and contexts to allow the reader to consider how it can be undertaken in similar settings or groups.

### 4 | RESULTS

There were four overarching themes that emerged from the six focus groups (see Table 3). The first theme; described how the ED and RACF nurses perceived that VTC facilitates person centred care. The second theme outlined nurses' experiences with VTC and how it builds confidence, relationships and trust between the ED and RACF. The third theme reflected the experiences of how bidirectional communication strengthens decision-making between the acute care setting and the RACF residents and carers. Theme four, described how the nurses experienced, technology access, connectivity and usability, including the positive and negative aspects of using VTC and the frustrations when technology did not operate as expected. The themes are presented in detail below with participant quotations to illustrate these findings.

#### 4.1 | Theme 1: Facilitates person-centred care

This theme highlighted how the nurses described how residents and their families were empowered to be more involved in decision making related to their care choices. In the event a resident was unable to make an informed decision about their own care, the family could advocate on their behalf, supporting the person's needs and unique circumstances. Nurses emphasised that their experience with the PACE-IT model of care (MoC) facilitated the inclusion of the residents' and/or families' wishes, involving them directly in decision-making about possible care options and preferences.

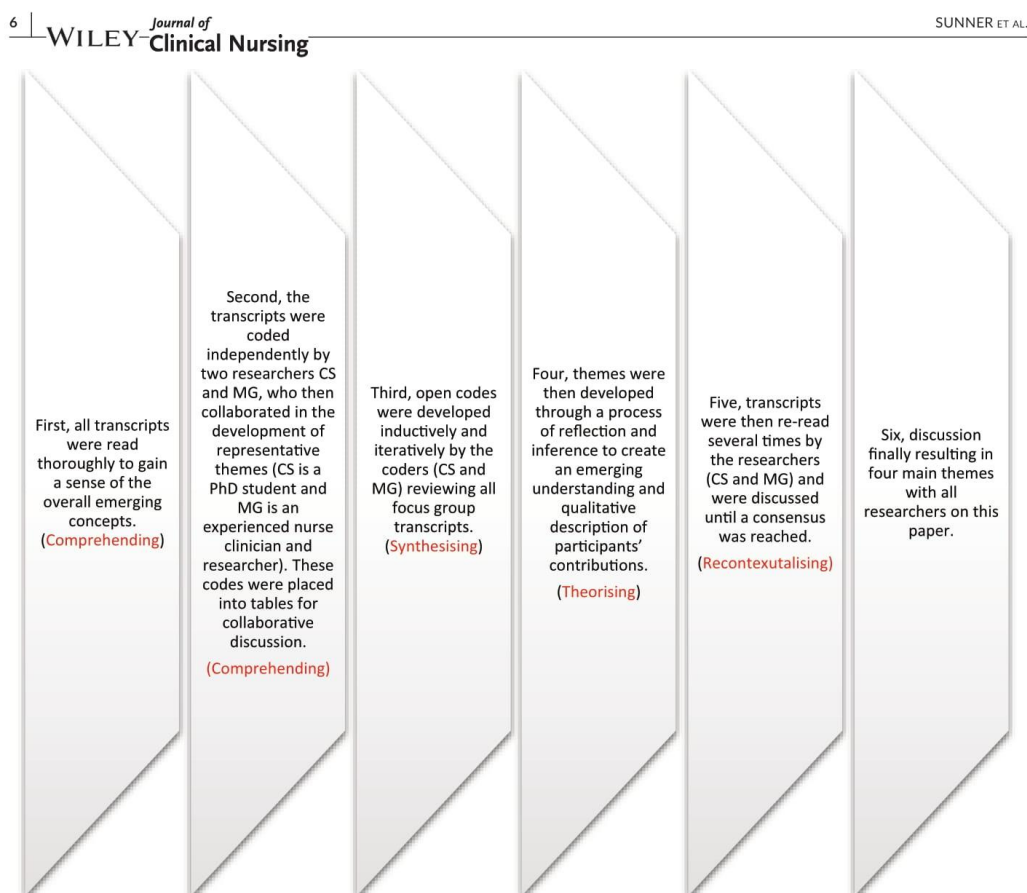
Nurses also acknowledged the experience of the PACE-IT MoC created a connection between the RACF and the ED, enabled a more individualised, smoother transition of care for the resident if ED transfer was required.

The RACF nurses perceived that the VTC process benefited the resident through the inclusion and engagement of residents in the conversation. Importance was placed on the information being directly conveyed from the resident to the ED and was "not second hand" thereby keeping the resident central to any decisions made about their own care;



**Figure 5.1**

*The Six-Step Analysis*



**FIGURE 1** The six-step analysis

And sometimes, if the patients are cognitively aware they can tell you more about what's going on with them.

(RFG2)

ED nurses expressed the value of having significant family members participate in the telehealth call, acknowledging that VTC allowed improved decision making about the resident's welfare with;

Better communication between the carers at the facility and the next of kin.

(EDFG2)

The ED nurses believed that families were comforted by becoming aware that they could personally communicate their family's wishes to the ED nurses via telehealth. This communication network was not just confined to the ED nurses but also to other clinical experts, e.g., staff specialists, who could also provide assessment and advice.

Reassurance was also provided to the family by the ED nurses that continuity of care would be provided when their relative arrived at ED if transfer was required, as stated by one ED nurse;

when she got to ED with her (mother) ... she said to me when I saw your face on the screen, she said I felt so relieved, because I had known this lady from multiple times in hospital and I had a rapport with her family, from looking after her previously, and she said she found that very comforting.

(EDFG1)

All the RACF nurses understood the importance of hospital avoidance, safety and patient-centred care for vulnerable residents. There was a general acknowledgement that the resident with a cognitive deficit would be at greater risk in an ED and the importance of being able to provide care for residents with unique needs and what was best for them as an individual;

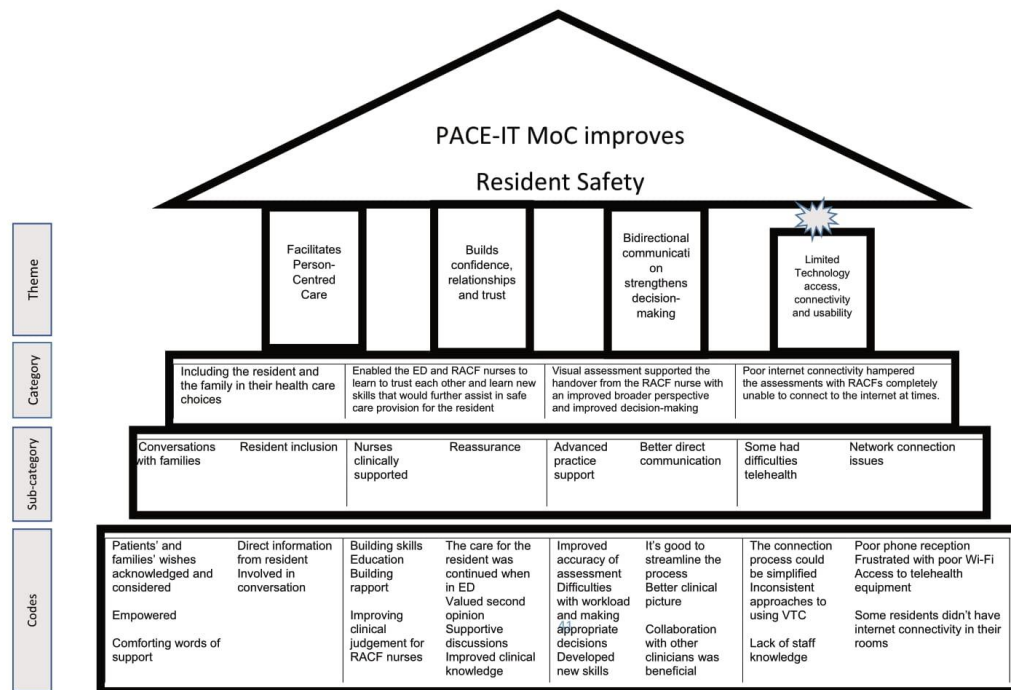
**Table 5.3**

*Themes, Categories and Codes*

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TABLE 3 Themes, categories, and codes



...and my resident ... that didn't go to hospital, he's living with dementia so it would've been an extremely confusing time for him. And for him to avoid a hospital admission was ..., (a) great outcome for him.

(RFG4)

All the RACF nurses also comprehended the physical risks the resident would be subject to in the ED and the benefits of them staying in the RACF with a treatment plan.

If you don't have to send someone to hospital that's great, because we can manage it here with our resources. It's their home. It's where they want to be, not stuck in an ED on a stupid thin little mattress. Getting pressure areas. I think it's a good resource.

(RFG4)

The nurses described that the PACE-IT MoC clearly facilitated the empowerment of the resident and their families, to enable a more person-centred approach to care. The nurses that participated in a VTC also experienced the benefit of further support and empowerment.

#### 4.2 | Theme 2: Builds confidence, relationships and trust

This theme encompasses how the nurses' experience of the PACE-IT MoC facilitated a real connection between the RACF and ED nurses, strengthening relationships and trust between them, as well as building confidence in RACF and ED nurses. Often junior nurses in the RACFs found themselves working alone in isolation with no senior nurses to approach for advice. In some instances, new graduate nurses working in the RACF needed clinical guidance to support their decision making and this was provided by the introduction of the PACE-IT MoC. This MoC enabled the ED nurses to visualise the resident and discuss the assessment with the RACF nurse.

The perceived benefit was the potential support the RACF nurse member could obtain with visual telehealth. A nurse described the isolation in her role and how being able to access some expert advice from the ED nurse could help improve the outcome for the resident;

...I have so many shifts alone, and there were no supports, like there was support, but as an RN I need extra support with decision-making and things, and especially weekends and night times, it was so hard...

even if I just call them and ask, "Okay, I have this doubt. I am stuck in this situation. Can you just help me?".

(RFG1)

to have them there ... and they're waiting for the resident [to arrive in the ED], this is also good for us to know that.

(RFG4)

As the RACF and ED nurses utilised VTC and used the ISBAR (CEC, 2021) assessment form more and more, they experienced a clearer communication pathway and gained greater familiarity with each other and with the technology. As a result, relationships started to form and with this came an increasing level of trust.

All the ED nurses that experienced telehealth shared the view that it was a welcome addition to resident assessments, describing it as a rewarding experience with great benefit to their practice. ED nurses are recognised in the ED as an advanced practice nurse in aged care, and the opportunity to utilise these skills, built their own clinical confidence as well. ED nurses felt "good" when a resident was able to avoid an unnecessary hospital transfer. An ED nurse reflected;

In terms of building your own skills, I think it's brilliant, because you do use your own clinical judgement, you use your assessment skills, and you do have to think on your feet, which I do appreciate, and I enjoy that aspect of it.

(EDFG2)

Strengthening relationships were a strong sentiment experienced by the RACF nurses focus groups. Unanimously, there was recognition that the PACE-IT MoC provided a face-to-face connection between RACF nurses and experienced ED nurses and other ED staff. One of the great benefits was how relationships were forged between the RACF nurses and the ED nurses over the VTC interactions. ED nurses felt that RACF nurses engaged more effectively with them over telehealth than just using the phone, a view captured in this comment;

With the facilities that do the telehealth I actually found that I've built a rapport with some of the RNs that ring on a regular basis and they've got to know me and trust me.

(EDFG1)

Furthermore, if transfer was required, RACF nurses believed and trusted that the ED nurse would continue to care for the resident when they arrived in the ambulance bay in the ED and families also found this reassuring. The relationships that were experienced between the nurses helped support and reassure RACF nurses about their decision making, describing the ED nurses as an accessible second opinion, and a second set of eyes;

It's like we nurses, we are supposed to know what is best for a resident that is deteriorating. But if there is a second person that can say ... verify ... It's good

The experience of establishing relationships between the RACF and the ED nurses enabled the building of trust and in-turn other benefits emerged. The nurses all valued the need to have structured handovers with each other so that the residents could receive the best care in the right place at the right time. The flow-on effect from the improved relationships between RACF and ED nurses was the enhanced confidence of RACF nurses. This in turn improved their ability to communicate the residents' needs and strengthen decision-making for RACF residents, thus allowing a smoother transition to ED or the creation of a structured management plan if the resident stayed at the RACF. Theme 3 illustrates the improved decision-making facilitated by the bi-directional communication process.

#### 4.3 | Theme 3: Enhanced bi-directional communication and decision-making

This theme reflects the nurses' experiences of how telehealth enhanced bidirectional communication and strengthens decision making. All ED nurses shared the belief that the importance of getting the correct information from the RACF nurses to inform shared decision-making. Over the phone there was a reliance on the accuracy of the clinical assessment skills of the RACF clinician, which were at times limited due to the lack of experience or knowledge of the skill level of the RACF nurses. The PACE-IT MoC strongly encouraged the use of the ISBAR (CEC, 2021) framework for assessment of the resident. The importance of its use was to ensure that the correct information was collected and communicated in a methodical structured way, thereby enabling and strengthening mutual decision-making related to the need for the resident. The addition of telehealth-assisted visual assessment allowing for the nurses to experience enhanced bi-directional communication between all those concerned, in a situation that may not have translated as well over the phone. In addition, the possibility of collaboration with emergency physicians in the telehealth call was viewed as an important enhancement of the decision-making process.

#### 4.4 | RACF nurses

RACF and ED nurses alike, described the difficult experiences that some RACF nurses had as they attended a thorough clinical assessment of a resident. Nurses shared the view that sometimes, newly qualified, or inexperienced nurses can find it challenging to make most appropriate decisions for residents, alongside the added pressure of large resident care loads. The nurses described that in their opinion, the addition of telehealth was able to bridge the experience gap to some extent, by supporting all levels of nurses with their assessments

and decision making. RACF nurses, in particular new nurses, outlined the experience and benefits gained by participating in the PACE-IT MoC, in that they had a chance to improve their own clinical assessment skills. As one new graduate RACF nurse explained;

I'm very new into the profession; it's been only six months I've been practising as an RN. For me, it has been a very useful thing ... I have my personal experiences, plus I have observed [other] people using it [telehealth]. I remember I was working alone upstairs and then I was starting to make the decision about what to do about the resident, then ... with video calling through a designated person [from ED], and that's how they can actually see [the resident] and help us to decide.

(RFG1)

Two clinical examples were provided by the RACF nurses experience with telehealth to illustrate how an improved clinical picture of the resident is obtained, which enhanced the assessment of the resident's well-being;

...and then we did a Scopia [telehealth platform] call, and [at] first sight she [ED nurse] told me, "Oh, she looks dehydrated. She needs to go to hospital," and it was like [she actually had] pelvic inflammatory disease. It helped when we had the video calls.

(RFG1)

...but you can show them, it's good that you can show them [ED nurses] the wound or something like that/.../ or if they're [the resident] looking really flushed and grey and 'worn down'.

(RFG2)

Several RACF nurses acknowledged that they had experienced much needed education through the addition of telehealth. They reflected that improving their communication and assessment skills, improved their decision making. They valued the advanced practice support that was provided in the telehealth call;

I sort of think having them there [ED nurses] it kind of prompts you, like they see things that you don't, which then provides an education tool for you to go, next time I'm going to look and go, okay, cool.

(RFG3)

The RACF nurses experiences talking to advanced practice ED nurses helped improve and develop new skills for RACF nurses as acknowledged by participants in one focus group;

I guess you learn as well. You can learn new skills and your clinical skills can improve. I mean, when

you get to speak to ED nurses who see some of these things all the time, where we don't, might not always necessarily see things, or we've got junior nurses that might not fully understand something because of their clinical skills. So, I guess it's a great way to learn as well.

(RFG4)

It was experienced by the RACF nurses that telehealth benefited the resident by helping RACF nurses take the time to understand the resident's history, thereby ensuring safer informed clinical decision making for the resident;

Yeah, it increases the clinical skill of an RN because before calling we have to check all those things, we have to cover all the head to the toe [clinical examination] and history...so it's actually a really good experience, so we get to know more about that resident, otherwise in this position we don't go and read [case notes of] every resident and learn...and we will cover all clinical aspects of the resident, and I think our clinical skill will be improved with this.

(RFG1)

#### 4.5 | ED nurses

Prior to the PACE-IT MoC facilitating a visual assessment, the ED nurses relied only on what the RACF nurses were able to describe to them over the phone. All the ED nurses who participated in focus groups shared the view that telehealth enhanced their ability to do a thorough clinical assessment of the resident that better informed the decision making of whether to transfer the resident to ED or keep them in the RACF. Making decisions became a lot clearer for them.

Coming from a triage background I like the visual aspect of it. So, I like to be able to lay my eyes on someone.

(EDFG1)

Difficult clinical decisions made over the telephone were better supported with a visual assessment via telehealth. One participant shared her experience;

That [telehealth] really sort of confirmed my decision around that and, you know, yes that resident was very dehydrated and definitely needed IV fluids.

(EDFG1)

In addition to enhancing the ED nurses' ability to make more informed decisions about transfer, the visual assessment provided a broader picture of the resident's condition, and if transfer was



required, the ED nurses shared the view that with their experiences they had a more accurate view of what to expect when the resident arrived and so could make some preparation based on the visual assessment;

So far telehealth hasn't necessarily helped me avoid unnecessary presentations, but it has helped me get a better picture of what is coming and interventions that can be done prior to arrival, and a better ability to be able to make a decision about appropriateness for transfer to ED.

(EDFG1)

All ED nurses experienced a clearer and more accurate story about the resident's presenting issue. Telehealth improved the ability to get the clinical picture about the resident and not just "snippets" of information that were made over the telephone. Telehealth consultation was an improvement on a phone call because

You seem to get better information because you can speak with the patient, whereas when you just take phone handover, you're just getting it from the RN of what they've seen and half the time, as others have said, you're not getting the full picture. And so, the telehealth seems to give you that better, broader picture of what's actually happening.

(EDFG1)

The addition of telehealth vision enhanced bidirectional communication in a situation that may not have translated as well over the phone. The experience in the following example was an instance where seeing the resident clarified exactly what the issue was, and allowed expedient care planning, enabling the resident to return home in a timely way;

...ACE call from the RN who was concerned about the resident chasing other residents around the ... [ward], threatening to injure the nurses, and we were able to get her on the screen and have the doctor look at her and determine that, yeah, this was not her baseline, this was an exacerbation of her dementia, you know, plus or minus a delirium. And so, it was good to see that and I think the RN felt reassured that we were, that we believed what she was describing. So that was a positive outcome. The patient came into the Emergency Department and we were able to treat her delirium and she was admitted for a short time and discharged home.

(EDFG1)

The value of a telehealth assessment was described by one ED nurses' experience where he was able to assess a resident's Glasgow

Coma Scale (GCS). A GCS is an assessment score out of 15, of impairment of conscious level based on a summation of scores for eye, verbal, and motor responses;

...the telehealth allows me to get better information than what I'm getting from the nurses over the phone... they told me that the patient was drowsy and GCS10 but on examination the patient was GCS14 and fully interactive and [I] didn't consider that he was unwell.

(EDFG1)

The collaboration of other staff was also seen as important in supporting the decision making and bidirectional communication. This was enhanced by the involvement of the multidisciplinary team including at times the ED physician. An ED nurse shared her experience;

... so the example that I have is a facility ringing up with concerns about a deteriorating ulcer on this resident's heel. And so, at that time we were able to get the ED consultant [physician] to join in on the telehealth and actually have a look at the heel as well. And so, the consultant didn't feel that the resident [heel ulcer] warranted an ED presentation. He felt that, you know, that the GP could actually review this.

(EDFG1)

However, some focus group nurses in both groups did experience that including the resident in a VTC assessment was not always appropriate, as described by one RACF nurse;

...there was another one [resident] who was really agitated; it was one of the residents who was in severe pain, and we were trying to get the ACE call, and he got really cranky, and I have never seen him swearing, but he was swearing, "Get lost," like he did not want to see the video calls, he just wanted to go to hospital, so that time it was so frustrating for him; he didn't want to have a video chat before, he just definitely wanted to go to hospital.

(RFG1)

The RACF nurses were encouraged to use ISBAR to communicate to the ED nurse and GPs. The ISBAR handover communication framework was reinforced in the PACE-IT education and emphasis placed on the need to prepare the ISBAR documentation prior to the telehealth call where possible. There was great concern experienced by ED nurses that this was not always the case. ED nurses talked of their frustration about the lack of preparedness on the part of the RACF nurses when they called the ED nurse;

I've found it hit and miss with the ISBAR and that's probably the one thing that I find a bit frustrating, is

that probably 70% of the time all the information is not there and ready, and I find that there's a lot of time wasted in looking up stuff, trying to give me the information that I'm asking for. So, yeah, from my experience /.../ and I don't know if everybody else feels the same, I feel that a lot more training has to be done on ISBAR.

(EDFG1)

Despite the best efforts of RACF and ED nurses to make the best possible decision for the residents, sometimes this was not possible due to other external influences. The nurses shared their experiences of how families challenged RACF nurses and at times hampered the ability for RACF and ED nurses to make the most appropriate clinical decisions. Some families had strong expectations that the RACF nurses should send the residents to ED contrary to their GP or the ED nurse's recommendations;

Unanimously, the nurses all experienced a GP who had not seen the resident, but demanded the resident be sent to ED;

There seemed to be problems formulating an ED avoidance plan for a resident when the pressure to send the resident to hospital is from the GP.

(EDFG1)

As the key health care provider for the RACF resident, the GP has a pivotal role in providing care for the RACF resident. All focus groups mentioned the difficulties associated with the absence of GP support in decision making for residents re need for ED transfer. The RACFs are expected to email or fax concerns to the GP as part of the assessment process, causing delays when requesting assistance;

A lot of the times, it's because they can't get onto their GPs, so they're either not in their practice or they haven't returned the email.

(EDFG2)

The GP would benefit from being included in the conversation via telehealth but to date this has been difficult as they are often not available at short notice. An ED nurse reinforced why the GP's involvement is so important;

...the GPs know the resident, whereas we don't. We're just seeing the resident for the first time, whereas the GP knows what their baseline is like, and this is quite unusual for this resident. So, that's why it would be more help for them to do [a] telehealth conference.

(EDG2)

Despite the many perceived benefits experienced by all focus group participants in providing a more person-centred approach,

building relationships and trust and enhancing communication, assessment and decision making, there was a strong thread of frustration expressed by many participants related to the use of the technological platform that is the basis for the PACE-IT MoC as revealed in Theme 4.

#### 4.6 | Theme 4: Technology access, connectivity and usability

This theme reflects the nurses' experiences and the difficulties navigating telehealth when there was poor internet capacity within RACFs, together with the excessive amount of time the telehealth could take, due to staff capabilities and flawed systems where streamlined connectivity was absent. ED nurses found that the success of a telehealth call was facility dependant. Some RACFs embraced telehealth well but were limited by the technology at their disposal. Others commented on the increase in time that it took to engage and set up the equipment where others felt it created a burden to begin with but after practice, they were able to become more efficient.

One of the negative aspects of telehealth experienced by both RACF and ED nurses was the extra time that it took to undertake a telehealth consultation. Previously, it was just a telephone call from the RACF to the ED and now with the PACE-IT MoC it became a telephone call with the addition of telehealth. ED nurses felt telehealth to be too time consuming and some commented that it should be streamlined and suggested how this could be done;

But sometimes I just feel like it's a bit of doubling up when you've got a phone call and then a telehealth. So, whether we can look at ... I mean, I know there's a lot of work being done to try and streamline that whole process through text message or whatever, to say, "Right, we need to do a telehealth with you in regard to a person, ... Can we meet in 10 minutes?", rather than doing a phone call, ... and then doing a telehealth.

(EDFG2)

Lack of preparation for the telehealth call was a common source of frustration experienced by the ED nurses, especially when they were expecting a quick ISBAR handover. Further delays occurred due to the RACF nurses locating the equipment needed such as the iPad and internet connection details;

Could you do a telehealth call?", then they're looking for iPads and looking for the patient, and that's all part of the time consuming during the call. So, it is not right there ready to go when they make that call, and it depends on the individual person using the telehealth

(EDFG2)

A few RACF nurses shared the view that it was quicker to handover over the phone rather than go through each step with telehealth. Other nurses felt that if the resident was going to ED anyway they would not need to have telehealth and resented the time it took;

Well, it could be simplified. Yeah. It would be easier for us. You know, because then you've got to find the number. Especially the RNs that aren't used to it, aren't used to the process, they need to be talked through it like, "This is how you've got to do it." You know, you've got to do this first and then you do that. So, with me, because I've done it several times, I know the process.

(RFG4)

The ED nurse experiences competing workplace demands in ED. They are often not situated in front of a computer at the time they receive an ACE call;

telehealth is a great resource, but yeah, when you're doing other jobs in the emergency department, sometimes it's just not viable.

(EDFG2)

After initial teething issues with the RACFs, the nurses experienced their own individual frustrations setting up for a telehealth call. This ranged from connectivity problems and equipment accessibility to;

Well, we weren't sure which of our iPads have the app but I think it's both [laughing]. It's nothing to do with the system. It's because we have many iPads. We didn't know which one has the app.

(RFG2)

The RACFs nurses agreed that there were initial apprehensions about using this new sort of technology but accepted it with practice and repeated exposure;

... as a human we will be a bit scared to get changes and things, but after that it will be really easy process, and technology-wise, it's just a click. It's easy to connect and it's really easy. Only we had a few occasions where it was trouble, but overall it was (a) really good experience.

(RFG1)

The ED nurses experienced a variety of support from the RACFs. Part of the project implementation plan included the use of a "champion" who acted as an education contact for telehealth. They would be tasked to feedback difficulties to the project team to ensure the PACE-IT MoC was streamlined. However, even with this in place RACF nurses still needed further assistance;

The facilities, I don't know, it comes back to buy-in, it comes back to the culture of the workplace and whether or not they've got good leadership, you know encouraging and empowering the staff members, and the massive turnover of staff.

(EDFG1)

The ED nurses experienced new RACF nurses or staff who were not acquainted with the telehealth process at all caused further frustrations;

In other instances, casual nurses or agency RNs, they're not familiar with the project and the iPad, or the iPad's not been charged, or they just don't know how to use the iPad, so that's a little frustrating.

(EDFG1)

Some examples of the use of telehealth were around its technology and functionality. An RACF nurse participant had concerns about hearing-impaired residents who were unable to hear the call. One nurses experiences with telehealth was that the resident could not hear as the iPads did not have a high enough volume;

They are, a lot of them are hearing impaired, so that's probably the only issue I have, is the iPads don't go loud... So I have to repeat and translate.

(RFG2)

The RACFs felt that their level of support from the project team was sufficient. However, they seemed to be plagued with poor internet capability. The majority of RACFs had poor Wi-Fi connections in some areas of their facility. This issue was consistently highlighted and experienced in all four RACF focus groups. Some RACFs did not even have reliable telephone connections, or a substantial bandwidth to run an internet telehealth connection;

So I've got one facility in particular that has terrible reception, so phone, when they ring often it's not even worth broaching the topic of Scopia [telehealth platform] with them because the phone doesn't work half the time, so that's really frustrating.

(EDFG1)

The experience at some RACFs was that they had internet; however, there was insufficient bandwidth to run the telehealth platform with a convincing level of quality. All participants described a range of these sorts of problems;

... as far as screen quality goes, sometimes that's a bit iffy, so it's harder to see, you know if I'm trying to count respirations or if I want to have a good look at



a wound it can be quite pixelly [sic], so difficult to see the finer details.

(EDFG1)

Some residents did not have the option of the internet in their own room if needed, since the internet connectivity was so poor;

...especially when you go to the resident's room the signal's not good.

(RFG3)

However, one RACF nurse offered this observation;

The only issue with the technology is the internet issues, otherwise it's easy to use and easy to connect.

(RFG3)

Overall, the experiences shared by focus group participants were positive ones. The findings revealed that VTC improved clinical practice in three ways. First, through facilitating person-centred care and building confidence, relationships and trust. VTC improved the experience and collaboration between the ED, the resident and the family, resulting in a more person-centred approach to care. Second, ED nurses shared the view that their clinical expertise was strengthened by the addition of a visual assessment of the resident. Further, the RACF and the ED nurses experienced new and strengthened relationships over telehealth, more so than had occurred with the previous telephone conversations and assessments. Finally, the experience of telehealth enabled a smoother transition for the resident when they had to come to ED, as their arrival was anticipated, their story was already known, and they could often see a familiar face on arrival to ED. These findings are discussed in the following section.

## 5 | DISCUSSION

This study set out to identify the experiences of nurses using telehealth in clinical settings and clearly highlights the many positive elements that RACF and ED nurses have shared through utilising the PACE-IT MoC. With this success in mind, the literature reveals that the international uptake of telehealth is slow, questioning why this form of technology has not been implemented more broadly (Zanaboni & Lettieri, 2011). According to existing evidence provided in a systematic review (Rush et al., 2018) telehealth is equally, if not more effective than using a telephone only, with limited evidence that it was comparable. Understanding clinicians' experiences of barriers and enablers to using telehealth is paramount to overcoming current challenges and enabling the use of telehealth more broadly. Overall, the findings presented, demonstrate consistency between the themes and data presented.

A major issue experienced by nurses in the study, was the lack of skilled nurses available to care for residents in RACFs, a problem shared nationally and internationally (Stephens et al., 2019).

The Covid19 pandemic has exacerbated this issue with nurses furloughed due to Covid19 exposures, resulting in staffing numbers in RACFs reduced to dangerously unsafe levels (Harris et al., 2020). Nesbitt (2012) claims that telehealth provides a way to support RACF nurses, connecting them with clinical expertise, in situ. A similar finding has been highlighted in other studies using VTC in areas of geriatric services (Pallawala & Lun, 2001) and tele-swallowing (Bidmead et al., 2015) and was also identified in studies (Chess et al., 2018; Corcoran et al., 2003) where RACF nurses were able to learn new skills over telehealth that further improved their assessments. In addition, Stephens et al. (2019) also reported positive findings that the collaborations of many clinicians brought about by telehealth, which also built a network of trust.

A key finding of this study found that VTC assessments strengthened decision making, by providing a better determination regarding the appropriateness of the RACF resident's transfer to ED. The decision by the RACF nurse to send a resident to ED can be largely subjective (Lemoyne et al., 2019), leaving the ED nurses totally reliant on the clinical decision making of the RACF nurse if visual assessment is not available and communication poor. The limitations of clinical information can lead to over-reporting or under-reporting symptoms, making it difficult for the ED nurse to understand the legitimacy of an emergency transfer of a resident to ED or whether the resident can be better managed in the RACF. With the support of visual telehealth, the confusion surrounding what make an appropriate transfer to ED can be better clarified. The inclusion of vision via telehealth assists with assessment capability using other tools such as the Glasgow Coma Scale and delirium screening tools that are used to communicate the condition of the resident in real-time. The ability to assess residents with vision via telehealth ensures that the ED nurses can make a more informed decision surrounding the aptness of RACF resident transfer.

In RACFs, if a resident is unwell, part of the escalation expectation for RACF nurses is to ring the resident's primary health provider, the GP. General Practitioners, in some instances feel that caring for RACF residents can be very time consuming, not well remunerated, and disruptive to their routine (Iannuzzi, 2019). However, one study by Ohlgs et al. (2020) found that VTC consultation for GPs provided a viable, time-efficient cost-effective alternative to physical visits to the RACF. In a randomised control trial by Joseph et al. (2020) found that GPs found VTC agreeable to help residents avoid hospital. However, ongoing infrastructure to manage emergency care was not readily available. There is clearly great potential for the PACE-IT MoC to facilitate easier and more timely access to the GP. The inclusion of the GP in VTC would further enhance the clinical decision making for the resident and potentially lessen the burden on EDs if they were available and engaged in the VTC MoCs.

Findings in this study highlight an important limitation to the use of VTC in RACFs generally. The poor internet capacity in RACFs was reported consistently by participants in this study, and remains a problem, locally and more broadly across Australia with VTC connections hampered by insufficient bandwidth at times (Taylor et al., 2020). In an enquiry into the aged care sector in Australia

(Royal Commission, 2021) evidence uncovered that RACFs have limited eHealth technology and connectivity is seen as a large impairment to equitable healthcare for older people. Alongside the poor connectivity in RACFs is the lack of uptake in VTC technologies, noticeable in Australia despite its viability internationally (Royal Commission, 2021). Access to VTC affirms the importance of stakeholder investments in technology and accessibility for the aged care sector if the adoption of VTC is to proceed.

Building a workforce that has the confidence to use digital technology is also a viable solution to VTC uptake. Nursing staff acknowledged that "user errors" could be overcome with further education, support and practical solutions. Considerable angst was experienced by RACF and ED nurses sharing the view that they had poor computer skills. The lack of "Digital Literacy" (Taylor et al., 2020, p. 8) has been identified by peak bodies as a barrier when it comes to progressing the use of VTC. Furthermore, the constant change of nurses in key roles and an unstable workforce, a heavy reliance on agency nurses and high staff turnover (Royal Commission, 2021) proves problematic when embedding VTC in RACFs due to the lack of staff consistency.

In summary, the important findings from this study will help inform future policy and proceedings related to VTC, by providing a lens into understanding the perspectives and experiences of RACF and ED nurses, and how VTC can be implemented and applied in clinical settings. Understandably, VTC further improves the nurses and families' experience in the decision-making process related to transfer to hospital for care and provides the opportunity for support and advice to RACF nurses who are often understaffed and inexperienced and lack digital confidence. Despite the many benefits realised through understanding the experiences of RACF and ED nurses using the PACE-IT MoC, findings highlight many challenges. More attention needs to focus on improving technology to ensure VTC is user friendly and time efficient, if sustainability of this MoC is to be secured. Prioritising this type of collaboration between expert ED clinicians and RACF nurses will help provide support and quality healthcare to vulnerable older people living in RACFs into the future.

### 5.1 | Limitations

Conduct of the focus groups differed according to the location of the participants and the Covid19 related restrictions in place at the time. All focus groups with RACF nurses were held face to face, whereas the ED nurses focus groups were via video-conferencing. These two different modalities changed the dynamic and the flow of the conversation. There were many distractions for the nurses online and some conversations were interrupted. The emotion and the spontaneous feedback were missing in the ED focus group and at times conversation was stilted. However, there was possibly less respondent bias as the interviewer was able to ask all participants methodically for their opinion without any over-assertive respondents taking control of the conversation, as occurred from time to time in the RACF focus groups.

## 6 | CONCLUSION

The focus group findings revealed that a VTC provided significant positive gains for the RACF resident and the nurses. The PACE-IT MoC with the inclusion of VTC made the encounter between the RACF, the resident and the ED, more person-centred and improved assessments, decision-making, and relationships between the ED and the RACFs. The benefits of this MoC far outweigh the negatives. However, the tensions surrounding the time it takes to do a VTC needs attention. Prioritising collaborations between expert ED clinicians and RACF nurses will help provide support and quality healthcare to vulnerable older people living in RACFs. Study findings provide valuable insights for managers and policy makers related to the benefits of VTC for RACFs as well as the shortcomings in the current infrastructure to accommodate sustained change. In support of a truly sustainable practice, VTC infrastructure needs to evolve and be further streamlined to the point that it becomes as easy as using the telephone.

## 7 | RELEVANCE TO CLINICAL PRACTICE

Our study has important implications for clinical practice. First, these results confirm that providing extra support via telehealth to RACF nurses will improve the quality of information exchange and quality of care to the residents. Furthermore, vision will improve communication pathways with the use of the ISBAR tool, which will further enhance assessment, building relationships, trust, and person-centred care. Furthermore, the older person healthcare sector will be more supported and less isolated with the inclusion of telehealth. Moreover, these findings can provide a strong base to support, develop and guide the continued use of telehealth into RACFs and EDs in any setting, due to its portability and scalability.

### ACKNOWLEDGMENTS

The team at the Nursing and Midwifery Centre for their valued input into the support needed for this project. Also the RACF staff and ASET staff that participated in the project.

### FUNDING INFORMATION

Translational Research Grant Scheme funded project with the Ministry of Health, New South Wales, Australia (H19/53776).

### CONFLICT OF INTEREST

No conflict of interest with any of the authors.

### DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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#### SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

**How to cite this article:** Sunner, C., Giles, M. T., Kable, A., & Foureur, M. (2022). Experiences of nurses working in RACFs and EDs utilising visual telehealth consultation to assess the need for RACF resident transfer to ED: A qualitative descriptive study. *Journal of Clinical Nursing*, 00, 1–16. <https://doi.org/10.1111/jocn.16529>

## **5.2 Summary**

This chapter provided insights into the RACF and ASET nurses' experiences using VTC. The focus group participants discussed positive interactions and improved relationships between the ED and the RACF nurses. Importantly, VTC provided person-centred care by including the resident's participation in the consultation, consequently improved clinical decision-making for the RACF and the ED nurses. In the following chapter, there is an examination of quantitative data from the PACE-IT study, encompassing the results related to ED presentations originating from RACFs, particularly during ED ACE hours.

## Chapter 6: A quantitative study

In this chapter the details of the implementation of a nurse-led intervention - PACE-IT - to augment an existing residential aged care facility outreach service with a visual telehealth consultation VTC using a stepped wedge cluster randomised control trial design and details results of the primary and secondary outcomes. The analysis for the primary outcome reports if there has been a clinically or statistically significant difference in the number of RACF-resident presentations to ED. The survey data have been included to answer the question of usability. The following paper has been accepted for publication in the BMC Health Services Research. The supplementary files of the paper are included as appendices to this thesis.

### 6.1 PACE-IT study results

**Title:** Implementation and evaluation of a nurse-led intervention to augment an existing Residential Aged Care Facility outreach service with a visual telehealth consultation: Stepped-wedge cluster randomised controlled trial.

#### 6.1.1 Abstract

**Background:** Up to 75% of RACF residents are transferred to EDs annually for evaluation and treatment for unexpected or urgent health problems. ED presentations of RACF residents can be expensive and risky, and many are unnecessary and preventable. Processes or triage systems to assess residents with a health event before transfer may reduce unnecessary ED transfer. The ACE service is a nurse-led ED outreach service that provides telephone support to RACF nurses regarding residents' health events. This service is available Monday to Friday, 8 am to 4 pm (ED ACE hours). The primary objective of this study was to assess whether the augmentation of the phone-based ED ACE service with the addition of a VTC would reduce the RACF rate of ED presentations compared to usual care.

The secondary objectives were to 1) monitor presentations to the ED within 48 hours post-VTC to detect any adverse events and 2) measure RACF staff perceptions of VTC usability and acceptability.

**Methods:** This implementation study used a stepped wedge cluster RCT design. Four public hospital EDs and 16 RACFs in two LHDs served as the study's settings. Each ED was linked to four RACFs with approximately 350 RACF beds, totalling 1,435 beds across 16 participating RACFs. Facilities were randomised into eight clusters, each comprising one ED and two RACFs.

**Results:** A negative binomial regression demonstrated a 29% post-implementation reduction in the rate of ED presentations (per 100 RACF beds) within ED ACE hours (IRR [95% CI]: 0.71 [0.46, 1.09];  $p = 0.122$ ). A 29% reduction, while not statistically significant, is still clinically important and impactful for residents and EDs. A post hoc logistic regression demonstrated a statistically significant 69% reduction in the probability that an episode of care resulted in an ED presentation within ED ACE hours post-implementation compared to pre-implementation (OR [95% CI]: 0.31 [0.11, 0.87];  $p = 0.025$ ).

**Conclusion:** Findings have shown the positive impact of augmenting ACE with a VTC. Reducing resident presentations to a busy ED is beneficial to health care overall, but more so to the older person who can recover safely and comfortably in their own RACF.

**Trial registration:** Australian New Zealand Clinical Trials Registry (ID ACTRN12619001692123) 02/12/2020.)

**Keywords:** Telehealth, nursing home, hospital transfers, patient safety, emergency care, older people



### 6.1.2 Contributions to the literature

- This study describes a novel approach to augmenting existing emergency department telephone outreach services to RACF with the implementation of an interactive VTC for assessment and clinical decision-making.
- Adopting VTC has shown a clinically important rate of hospital avoidance for RACF residents and should be implemented more widely.
- This study justifies interventions using VTCs to support RACF clinicians with decision-making.

### 6.1.3 Declarations

**Ethics approval and consent to participate:** Consent, adhered to the standards and guidelines that align with the ethical approval processes outlined by the Australian National Health and Medical Research Council. The Hunter New England Human Research Ethics Committee (2019/ ETH12853) and University of Newcastle Human Research Ethics Committee (H-2020-0090) approved that individual informed and signed consent of residents was waived in this study given that the intervention was being implemented at facility level and was considered part of usual care and practices (adding a visual augmentation of already existing routine ACE practices). All individual clinical data were collected, de-identified and reported in accordance with Australian National Health and Medical Research Council and these methods were approved by the Hunter New England Human Research Ethics Committee (2019/ ETH12853) and University of Newcastle Human Research Ethics Committee (H-2020-0090).

**Consent for publication:** Not applicable.

**Availability of data and materials:** The datasets used during the current study are available from the Australian Data Archives at the Centre for Social Research and Methods at the Australian National University. The repository website is <https://ADA.edu.au>.

**Declaration of competing interest:** The authors have no competing interests to declare relevant to this article's content.

**Funding:** Ministry of Health, NSW, Australia, Translational Research Grants Scheme (H19/53776).

**Author contributions:** CS drafted the manuscript and coordinated revisions based on extensive critical comments from MG, JB, CO and MF. CO assisted in developing the study design, methods, data analysis and critical comments on the manuscript. CH and RB were involved in an advisory capacity as experts in the ACE process. All authors have read and approved the final manuscript.

**Acknowledgements:** Thanks to Honorary Professor Ashley Kable for her support and critical appraisal of the project, the funding body (the NSW Ministry of Health's Translational Research Grants Scheme), the advisory committee members and the RACF and LHD partners for their support and contributions to the project. Sincere thanks goes to the RACFs and EDs for their participation, enthusiasm and support for the project and their willingness to participate in this project.

**Implementation and evaluation of a nurse-led intervention to augment an existing residential aged care facility outreach service with a visual telehealth consultation; stepped wedge cluster randomised control trial**

#### **6.1.4 Background**

While unnecessary ED presentations are a major issue in all hospital EDs, the risk is more so for the vulnerable RACF resident. The ED environment can be distressing and disorientating for an older person and can expose the RACF resident to unnecessary risks such as physical harm, psychological distress, and iatrogenic complications such as delirium, falls, medication errors, pressure injuries and even death (Dwyer, Gabbe, Stoelwinder, & Lowthian, 2014; Marsden et al., 2018). Furthermore, RACF residents have a very high rate of

ambulance use, up to four-times higher than that of their community counterparts (Dwyer, Gabbe, Stoelwinder, & Lowthian, 2014) with the cost of a single transfer by ambulance of a resident from an RACF to an ED in one Australian study reported as over \$1800 (Morphet et al., 2015). These issues highlight an urgent need to provide improved primary care services for RACF nurses to support and manage residents whilst remaining in the RACF to avoid unnecessary presentations to ED where possible.

In the last decade, an extraordinary increase in people aged over 65 years has been observed in almost all countries (WHO, 2018). In Australia, from 2010 to 2020, the population aged over 85 years increased by 110%. (ABS, 2020). Consequently, the number of people needing supportive care in residential aged care facilities (RACF) between 2010 and 2020 has increased by 13% and the number of women almost double the number of men (AIHW, 2022). In 2022 there were 178 000 people living in RACFs in Australia (AIHW, 2022) of these residents 96.1% were known to have physical or cognitive impairment (ABS, 2020) that may cause some sort of limitation, restriction, or impairment to their activities of daily living.

More and more older adults are spending a longer time living independently at home before transitioning to a RACF. This transition often occurs when individuals are in poorer health and have more complex care needs . The chronic and intricate physical and cognitive challenges faced by residents in residential aged care facilities (RACF) often involves coexisting conditions like frailty and cognitive impairment. These conditions render them more vulnerable, especially when it comes to advocating for their preferred treatment goals (Dwyer, Stoelwinder, Gabbe, & Lowthian, 2015).

RACFs face numerous challenges in managing residents with increased healthcare demands, resulting in greater workloads for staff and a lack of timely access to primary healthcare doctors and geriatric care expertise (Winzar, 2022). The shortage and

unavailability of primary healthcare providers or general practitioners (GPs) can be attributed to various reasons, including complex issues in residents with greater health needs, poor remuneration for the GPs' time, and conflicting practice commitments (Burgess, 2015). Starting in July 2023, Australian RACF providers must have an RN on-site 24/7 at each facility (Department of Health and Aged Care, 2023). However, when RACF nurses can't access timely GP advice, it still results in unnecessary resident transfers to the ED.

Establishing goals of care are particularly important for older residents as they outline what a resident (or the carer) wants to achieve during an episode of care, within the context of their medical situation (Palmer, 2018). When these goals are not well articulated and established, residents may receive complex and invasive investigations, treatments, and procedures in ED, that are not always beneficial.

The reliance on others to make decisions about their health care needs has contributed to higher RACF resident presentations to hospital emergency departments (ED), compared with their community counterparts (Royal Commission, 2021). Of major concern is the finding that RACF residents are often discharged from an ED presentation without any need for treatment or an ongoing management plan. Emergency Department presentations, without subsequent admission to hospital, have been reported to be up to 40% of all RACF resident presentations to ED (Morphet, Innes, Griffiths, Crawford, & Williams, 2015; Royal Commission, 2021; Schnitker, Martin-Khan, Beattie, & Gray, 2011).

Other RACF outreach programs like INTERACT (Ouslander et al., 2014), admission avoidance (Crilly et al., 2011), and INTERCARE (Zúñiga et al., 2019) offer care pathways and guidance to RACF nurses for RACF residents and hospital avoidance. However only one other Australian study (Hullick et.al., 2022) was a nurse-led, visual telehealth consultation, situated in the emergency department of a hospital. The Hullick et. al., (2022) study most closely reflects the study presented in this paper.

A model of care that aims to improve primary care services for the older person in RACFs is the Aged Care Emergency (ACE) service. The Aged Care Emergency service provides outreach support to assist RACF nurses with decision-making and establishing clearly defined goals of care for the RACF resident, prior to a journey to ED (Hullick et al., 2016). The Aged Care Emergency service supports RACF nurses when the Primary health provider or general practitioner (GP) is unavailable and communicates care goals for resident transfers to the ED but does not replace the GP as the primary healthcare provider for RACF residents.

In its current form telephone calls to the ACE service are usually answered by Aged Care Service Emergency Team (ASET) registered nurses working in the ED who have advance practice knowledge in older person care. In consultation with the RACF nurses, ASET nurses provide support over the telephone, guided by evidence-based algorithms, to help determine whether transfer of the resident to ED is necessary (Conway et al., 2015). Planning alternative pathways for residents with the use of the ACE service also means the RACF nurses, residents and carers not only have an opportunity to avoid an ED presentation but there are also further savings through avoiding the cost of ambulance transfer (Ling et al., 2018).

The ACE service is available 24 hours a day, however it has two providers; the ED ACE service is available Monday to Friday between 8am and 4pm (ED ACE hours) and a non-ED ACE service is provided by a separate primary health care provider for after-hours ACE calls.

A limitation of the ACE service is that the calls are by telephone only. More recently the emergence of visual telehealth has been utilised in health care. A recent scoping review found that the addition of Visual Telehealth Consultations (VTC) reduced hospitalisation of RACF residents (Sunner, Giles, Kable, & Foureur, 2022) with one randomised controlled

trial reporting that 71% of residents were successfully managed in the RACF with the use of visual telehealth (Joseph et al., 2020). However, reviews and meta-analyses of studies on the use of telehealth in RACFs highlight many poor-quality studies, with inconsistent outcome measures demonstrating a need for more robust and large-scale implementation studies (Newbould, Mountain, Hawley, & Ariss, 2017). We propose that a nurse-led ED ACE model, augmented by the addition of VTC and structured and documented communication processes, implemented within RACFs, has the potential to optimise the benefits of both ACE and VTC, to reduce avoidable RACF resident presentations to ED.

Findings presented in this paper arise from the Partnerships in Aged Care Emergency using Interactive Telehealth (PACE-IT) study (Sunner et al., 2020), which had the following aims:

to assess whether the augmentation of Age Care Emergency services through the addition of interactive Visual Telehealth Consultation (= Emergency Department Age Care Emergency Age Care Emergency/ Visual Telehealth Consultation VTC) for clinical decision-making, plus a structured and documented communication framework and telephone follow-up, reduced RACF resident presentations to ED compared to usual care within ED Age Care Emergency hours, 8am-4pm Mon-Fri;

to identify potential adverse events for residents who did not attend the ED, by conducting a 24-hour follow-up survey and assessing RACF resident ED presentations within 48 hours of a Visual Telehealth Consultation;

to ascertain RACF staff perceptions of Visual Telehealth Consultation acceptability and useability within 48 hours of participating in a Visual Telehealth Consultation;

to assess uptake of Age Care Emergency / Visual Telehealth Consultation during ED Age Care Emergency hours.



Several secondary outcomes have already been reported, encompassing staff perception of barriers and enablers to implementation and sustainability three-months post-implementation, staff acceptability and engagement at the same time-point, as well as resident and family experiences with the intervention one-month post-implementation (Sunner et al., 2022). A separate report will present the cost consequence analysis.

The presented findings adhere to the Standards for Reporting Implementation Studies (StaRI) checklist (Pinnock et al., 2017) and comply with guidelines for reporting stepped wedge cluster randomised controlled trials, as outlined in the extension of the CONSORT 2010 statement (Hemming et al., 2018). The significance of the proposed intervention is its potential impact on improving care for older people that reside in RACFs and reducing the associated risks for residents with ED presentation and hospital admission.

## **6.2 Methods**

**Study design:** This large-scale implementation study used a stepped wedge cluster RCT design, which was chosen for its pragmatic approach allowing for rigorous evaluation in a real-life setting (Hemming et al., 2015). The study protocol has been described earlier (Sunner et al., 2020). The trial is registered with the Australian New Zealand Clinical Trials Registry (Trial ID: ACTR N12619001692123).

**Setting:** The study was conducted in four public hospital EDs in two LHDs and 16 RACFS in NSW, Australia. The EDs were selected for their metropolitan and rural locations; LHD A has two metropolitan and one rural ED, and LHD B has one rural ED. The Australian Department of Health and Aged Care uses the Modified Monash Model (MMM) to categorise different geographical locations based on Australian bureau of statistics (4). In this context, the participating EDs for LHD A had two EDs in a metropolitan city (MMM 1), and another is a large rural town (MMM 3) and LHD B primarily covers a large rural town (MMM 3). An area outside of a major city is considered rural in Australia (DOH, 2022).

Each selected ED was linked with four RACFs with approximately 350 RACF beds, totalling 1,435 beds across all 16 participating RACFs. For implementation purposes, facilities were organised into eight clusters for randomisation, each comprising one ED and two RACFs (Figure 6.1); each ED was included in two clusters. The intervention was sequentially implemented in the RACFs in each cluster following an order determined by the randomisation process—the study ‘steps’—with a time interval of three to seven weeks between each step. Data were collected on episodes of care from three months prior to the commencement of the intervention to three months after the last intervention, resulting in 14 months of data for analysis.

An episode of care included all instances where an ED medical record was created for a RACF resident when:

- the resident was transferred to the ED, with or without an ED ACE call/VTC, or
- an ED ACE/VTC was attended, and the resident was not transferred to the ED.

For descriptive statistics, primary and secondary outcomes and the post hoc analysis, only episodes of care that occurred within ED ACE hours (Monday to Friday, 8 am to 4 pm) were included. An extra analysis was conducted for comparison, including all episodes of care (non-ED ACE and ED ACE combined).

NB individual residents may have had more than one episode of care within the study period.

**Sample size:** The pilot study conducted in 2018 (not published) identified 82 RACF ED presentations/100 beds annually. With 16 RACFs contributing 1,435 beds ( $X = 87$ ) to this study, adopting the intervention in the sequence shown in Figure 6.1, estimating that this design would have 80% power to detect a 35% relative reduction in ED presentations/100 beds annually (at 5% significance), assuming an intra-class correlation of 0.01.

**Participating sites:** After the executive directors of LHD A and LHD B agreed to participate in the study, an expression of interest was emailed to RACF managers from both LHDs inviting them to participate. To be considered for inclusion in the PACE-IT project, RACFs in the two LHDs were eligible if they reported more than 40 RACF-resident presentations to ED in 12 months. In addition to the number of presentations, RACFs were required to have functioning Wi-Fi and internet capacity and be willing to commit a minimum of six staff for PACE-IT training. A letter of agreement was signed by the management of each RACF committing to the project for its duration. Individual consent was not required for RACF residents' participation in this project as care provision was an extension of an existing service (ACE) and considered part of usual care in the event of an acute health episode.

**Intervention:** The PACE-IT project augmented the pre-existing nurse-led ED ACE MOC (Supplementary File 1—The essential elements of ACE [Hullick et al., 2021, p. 203]) with the addition of VTC in LHD A. ACE consists of telephone calls from RACFs for consultation and is provided 24 hours a day, by two separate services—the ASET nurse in the ED from 8 am to 4 pm and after hours by a separate primary healthcare provider. ED ACE refers to where an ASET nurse takes ACE calls within rostered hours—Monday to Friday, 8 am to 4 pm—and non-ED ACE, where a separate healthcare provider takes after-hours ACE calls. However, LHD B had no pre-existing ACE service prior to the PACE-IT implementation, so ACE and PACE-IT were implemented simultaneously. LHD B had a budgeted project coordinator employed specifically to assist with the implementation process and data collection and additional Aged Care Emergency education and resources provided. The PACE-IT intervention provided an interactive ED ACE/VTC to enhance assessment and decision-making and a 24-hour follow-up phone call for residents who did not present to the ED. Refer to the ACE and VTC flowchart (Supplementary File 3) for further explanation.

If the resident did not visit the ED, a follow-up phone call was conducted within 24 hours of a VTC to monitor potential adverse events. Follow-up callers asked RACF staff questions regarding the resident's current condition, receipt of the summary plan—which was agreed upon during the VTC—ease of understanding and continuing the summary plan, and any concerns regarding the treatment plan or the resident.

Specific education about the intervention and its implementation was developed for each RACF facility and ED and there was the option of more than one session available to ensure nurses who would be responsible for undertaking a VTC from the RACF/ED could access the education during a rostered day. The education sessions were flexible and were mostly facilitated person to person in RACFs. However, due to the impact of COVID-19 and the associated social distancing requirements, two education sessions were held via video conferencing and four were held at an offsite venue external to the RACFs. The implementation education encompassed a range of activities such as a structured communication framework that is used in the LHD for clinical handover (ISBAR) outlines the following; Introduction, Situation, Background, Assessment and Recommendations (ISBAR) (Hunter New England Local Health District, 2019). This ensured the RACF staff provided all relevant information over the phone and that the ASET nurse recorded this structured information electronically during the call. Other aspects of the education included; simulated role-playing in VTC, on-site visits to emergency departments for RACF nurses, reciprocal visits to residential aged care facilities by ASET Nurses, and the use of instructional and informational videos. A proof of concept was undertaken during 2018 over four months implementing VTC to four RACFs, providing a structured educational plan to RACF/ASET nurses resulting in a 27% reduction in hospital transfers. This reduction served as the basis for designing and implementing the strategies outlined in the formal study discussed in this paper.

**Figure 6.1**

*Data Collection Periods in PACE-IT Stepped Wedge Design (Metro-Metropolitan)*

			Pre and post-implementation periods													
			Period number													
Cluster	ED	RACF	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	ED 1	Rural 1														
		Rural 2														
2	ED 2	Metro 1														
		Metro 2														
3	ED 1	Rural 3														
		Rural 4														
4	ED 4	Rural 5														
		Rural 6														
5	ED 3	Metro 3														
		Metro 4														
6	ED 3	Metro 5														
		Metro 6														
7	ED 4	Rural 7														
		Rural 8														
8	ED 2	Metro 7														
		Metro 8														
			Site unexposed to intervention (pre-implementation)													
			Site exposed to intervention (post-implementation)													

**Implementation:** The PACE-IT implementation strategies were evidence based, incorporating engagement, facilitation (Flodgren et al., 2011), education (Flodgren et al., 2011), resource development and deployment (Giguere et al., 2012) and monitoring and feedback (Ivers et al., 2012). The initial implementation strategy anticipated the study's midpoint to occur around the onset of winter. To allow the aggregated control and intervention periods across steps, the study needed to involve equal amounts of winter/non-wintertime, thus accounting for seasonal variations during the 'flu' season, enabling reliability and consistency in measurement. The onset of COVID-19 delayed the commencement of the PACE-IT implementation and further affected resident presentations to the ED. The three months before the first intervention (March 2020) to the three months following the last intervention (April 2021) comprised the 14-month analysis period. Further implementation details are available in Supplementary File 4.

## **6.2.1 Measures**

### ***6.2.1.1 Data collection***

Primary outcome: The rate of ED presentations from RACFs per 100 RACF beds during ED ACE hours

Secondary outcomes:

1. Presentations to the ED within 48 hours post-ED ACE/VTC
2. RACF staff perceptions of VTC usability and acceptability
3. Uptake of ACE/VTC

Further to this, process measures to monitor potential adverse events are presented, using responses to a follow-up phone call from ED staff to RACF staff who attended a VTC within the previous 24 hours, where the resident did not present to ED.



Data to assess the primary and secondary outcomes and process measures for LHD A were obtained from an ED electronic patient management system (PMS). Data from LHD B were obtained monthly via an onsite PACE-IT liaison person. Two of the RACFs (Rural 1/2) were separate RACFs but from the same company and co-located. Data from these sites were combined in PMS as one RACF (with the same RACF ID).

Data measuring RACF staff perceptions of VTC usability in both LHDs were collected from an anonymous electronic survey (including demographic data) emailed to every RACF nurse who attended a VTC. This was to assess the usability, acceptability and any technical issues involved with using the VTC.

The PACE-IT Research Project Staff Survey (Supplementary File 5), modified from the Telehealth Usability Questionnaire (TUQ) (Parmanto et al., 2016), was piloted among various staff members to ensure that the survey was ‘well framed, sequenced and question selection [was] polished before it [was] circulated’ (O’Leary & Hunt, 2016, p. 161). The TUQ was found to have ‘good’ to ‘excellent’ reliability with a Cronbach’s alpha coefficient of 0.81 and was demonstrated to perform well in previous studies for relevant study populations (Parmanto et al., 2016), adding validity to this study.

#### ***6.2.1.2 Statistical methods***

Descriptive statistics for episodes of care occurring in ED ACE hours (Monday to Friday, 8 am to 4 pm) are presented as counts and percentages for categorical data. Mean, standard deviation (SD) and median (with minima and maxima) for continuous data are presented. The measures presented are the proportions of episodes of care by type of contact.

This was an intention to treat analysis. Intention to treat in this context means that all calls which occurred after the implementation of the intervention were deemed to be VTC calls regardless of whether they were a phone call or VTC.

The number of ED (physical) presentations were aggregated at the RACF level for each study month. Months were classified as pre or post-implementation, based on the month that the intervention was first implemented. There was an RACF “settling in period” of two weeks that allowed close surveillance of barriers and enablers that didn’t affect the VTC count. The month that the intervention was first implemented in a RACF, and all following months, were classified as post-implementation, regardless of on which day the implementation occurred. The rate of ED presentations per 100 RACF beds was modelled using a mixed effects negative binomial regression model with the number of ED presentations per month for each RACF as the outcome and the log number of beds per 100 RACF beds as the offset. The analysis included terms for study month (as categorical) and implementation status (pre or post-implementation) as fixed effects. The categorical study month variable was used to adjust for potential effects of underlying secular trends at each discrete time point, which was assumed to be common among all sites. Random intercepts for cluster and RACF nested within a cluster were included in the model. The difference in rates of ED presentations between pre- and post-implementation periods within ED ACE hours was examined and reported as IRR with 95% CI. The difference in rates of ED presentations between pre- and post-implementation periods during ED ACE hours combined with non-ED ACE hours was also reported.

The secondary outcome was presentations to ED within 48 hours and not the same day as the episode of care for RACF residents who had not presented to ED after a VTC. This outcome was assessed by auditing the results of the 24-hour phone call and comparing it to the reason for the ED presentation to decide if an adverse event had occurred.

A disadvantage of modelling the rate of ED presentations per month per RACF is that it does not consider the actual number of episodes of care. Episodes of care where an ED ACE/VTC was conducted and the resident did not attend ED are not explicitly included as data when modelling the rate of ED presentations. Therefore, in a post hoc analysis, logistic regression was conducted on all episodes of care with ED presentation (yes/no) as the outcome, variables for pre- and post-implementation and study month fitted as fixed effects and adjusting for resident gender and age. This analysis defined the pre/post-implementation status based on the actual date of the implementation, not the month of implementation. It estimated the odds of an episode of care resulting in an ED presentation post-implementation relative to pre-implementation. Random intercepts for cluster and RACF nested within a cluster were included in the model.

The proportion of ED ACE calls conducted pre-implementation and the proportion of ED ACE/VTCs post-implementation are presented to assess the uptake of VTC.

## **6.2.2 Results**

### ***6.2.2.1 Demographic characteristics***

There were 333 RACF episodes of care during ED ACE hours pre-implementation and 421 RACF episodes of care during ED ACE hours post-implementation. In the Demographic Table 6.1 characteristics of residents have the minimum age as low as 35, the gender is not representative of the Australian RACF cohort, however participating sites encompassed rural and metropolitan areas to reflect the diversity of RACF residents.

Demographic characteristics and frequencies of episodes of care are presented in Table 6.1 by pre- and post-implementation.

### ***6.2.2.2 Uptake of ED ACE/VTC***

A total of 98 ED ACE calls—or 29% of all episodes of care—were made pre-implementation. The RACF resident did not present to the ED in 35 of these calls. Overall,

235 of the 333 RACF episodes of care (71%) resulted in an ED presentation (with or without a prior ACE call).

A highly significant increase in the number of ED ACE calls made, with or without the addition of VTC ( $p < 0.01$ ), was observed post-implementation, with 222 ED ACE/VTCs made, accounting for 53% of all episodes of care. Of these calls, 72 resulted in the RACF resident not presenting to the ED. Overall, 199 of the 421 RACF episodes of care (47%) resulted in an ED presentation (with or without a prior ED ACE/VTC). Descriptive statistics of ED presentations are presented in Table 6.1 and 6.2.

**Table 6.1**

*Characteristics of Residents*

Characteristic	Response/statistic	Pre-implementation	
(N=333)	Post-implementation		
(N=421)			
Resident age	mean (SD)	83 (9)	84 (8)
	Median (min, max)	85 (34, 100)	85 (45, 102)
Resident gender	Female	171 (51%)	224 (53%)
	Male	162 (49%)	197 (47%)
Aboriginal and/or Torres Strait Islander peoples	11 (3%)	16 (4%)	
Characteristic	Response/statistic	Pre-implementation	
(N=333)	Post-implementation		
(N=421)			

<sup>§</sup> Based on 98 months of data pre-implementation (an average of 6.1 months per RACF) and

126 months of data post-implementation (an average of 7.9 months per RACF).

**Table 6.2***Characteristics of episodes of care*

Characteristic	Response/statistic	Pre-	Post-
		implementation (N=333)	implementation (N=421)
Episodes of care	ED ACE/VTC with no ED presentation	35 (11%)	72 (17%)
	Presented to ED (after ED ACE/VTC)	63 (19%)	150 (36%)
	Presented to ED (without ED ACE/VTC)	235 (70%)	199 (47%)
ED ACE/VTC		98 (29%)	222 (53%)
Crude annual rate of ED presentation per 100 RACF beds <sup>§</sup>		41 per 100 RACF beds	37 per 100 RACF beds

<sup>§</sup> based on 98 months of data pre-implementation (average of 6.1 months per RACF) and 126 months of data post-implementation (average of 7.9 months per RACF)

### **6.2.2.3 Rate of RACF resident ED presentations pre/post-implementation**

The results of the mixed negative binomial regression of the rate of ED presentations (per 100 RACF beds) are presented in Table 6.2. There was a non-significant 29% decrease post-implementation (IRR [95% CI]: 0.71 [0. 46, 1.10] p = 0.122) in the rate of ED presentations (per 100 RACF beds) during ED ACE hours compared to pre-implementation.

When ED ACE and non-ED ACE hours combined were analysed, there was a non-significant 4% decrease post-implementation (IRR [95% CI]: 0.96 [0. 65, 1.42], p = 0.844) in the rate of ED presentations (per 100 RACF beds) compared to pre-implementation.

#### 6.2.2.4 Post hoc analysis of episodes of care resulting in an ED presentation

The results of the logistic regression analysis of episodes of care showed a significant post-implementation reduction of 69% in the odds of an episode of care resulting in an ED presentation (OR [95% CI]: 0.31 [0.11, 0.87],  $p = 0.025$ ). The results are shown in Table 6.3.

**Table 6.3**

	Negative binomial regressions *	
	Adjusted estimates **	
	IRR (95% CI) ***	p-value
ED presentation during ED ACE hours	0.71 (0.46, 1.1)	0.122
All ED presentations (ED ACE + non-ED ACE hours)	0.96 (0.65, 1.41)	0.844
	Logistic regression #	
	Adjusted estimates ##	
	OR (95% CI) ###	p-value
ED presentation during ED ACE hours	0.31 [0.11, 0.87]	0.025

\* Negative binomial regressions are based on episodes of care resulting in an ED

presentation ( $n = 333$  pre-implementation,  $n = 421$  post-implementation).

\*\* Estimates from negative binomial regressions, adjusted for study month and implementation status.

\*\*\* Rate per 100 RACF beds.

# Logistic regressions are based on all episodes of care within ED ACE hours, whether it resulted in an ED presentation or not ( $n = 333$  pre-implementation,  $n = 421$  post-implementation).

## Estimates from logistic regression, adjusted for study month and implementation status.

### Odds ratio of an episode of care resulting in an ED presentation post relative to pre-implementation.



#### ***6.2.2.5 Presentations to the ED within 48 hours post-VTC to identify adverse events***

Pre-implementation, there was one occurrence where an ACE call was made, and the agreed plan was for the resident to remain and be monitored by staff in the RACF. However, the resident had an unplanned presentation to the ED within 48 hours of the initial call. Post-implementation, there were two occurrences where a VTC was made, and the agreed plan was for the resident to remain and be monitored by staff in the RACF; the resident had an unplanned presentation to the ED within 48 hours of the initial VTC. For the post-implementation residents, no concerns were raised by RACF staff regarding the condition of either resident during the 24-hour follow-up phone calls. Comments received regarding the residents' condition during the 24-hour follow-up phone call were 'neuro observations stable' and 'will follow up with ACE if any issues'. Of the two residents that presented to ED within 48 hours, neither reported adverse events; one required a referral for a wound care follow-up, and the other required investigation for hip pain not initially reported in the VTC. No analysis was conducted to compare 48-hour presentations pre- and post-implementation as there were insufficient numbers to justify this.

#### ***6.2.2.6 RACF staff perceptions of usability and acceptability of VTC within 48 hours of participating in VTC: PACE-IT Research Project Staff Survey results***

There were 113 VTCs attended for the duration of the project. On each occasion, when a VTC was completed, an electronic hyperlink to the PACE-IT Research Project Staff Survey was emailed to the nominated RACF contact person to disseminate to the relevant RACF staff participants. The survey received 44 responses (39%)—39 complete and five partially complete. The characteristics of the survey respondents are described in Table 6.4.

**Table 6.4***Characteristics of the PACE-IT Research Project Staff Survey's Respondents' Results*

Characteristic		Respondents (N=44, 39%)
Age group	Less than 30 years	12 (27%)
	31-41 years	17 (39%)
	41-50 years	11 (25%)
	51-60 years	4 (9%)
Gender	Female	34 (77%)
	Male	10 (23%)
Registered nurse		32 (73%)
Other level of staff		12 (27%)
Spoke a language other than English at home		17 (39%)
Only spoke English at home		27 (61%)

Of the respondents 27 (61% ) had attended the face-to-face training required for the PACE-IT intervention (Sunner et al., 2020, pp. 5-6). Twenty responders (45%) considered that it took between 10- 15 minutes to undertake the call. Responses to the useability and acceptability of VTC in the RACF indicated that 38 responders (86%) strongly agreed or agreed that it was easy to set up and 39 (88%) strongly agreed or agreed that it was easy to use. Thirty eight responders (86%) strongly agreed or agreed that the quality of the call was acceptable. When examining the time, it took to do the call, 31 (70%) strongly disagreed or disagreed that it was too time consuming. One hundred percent of respondents indicated that a Visual Telehealth ACE call enhanced communication and 97% felt it provided a person-centred approach (one respondent was neutral so no respondents disagreed with this question). Ninety two percent of respondents strongly agreed or agreed that they were

satisfied with the agreed resident management plan (the remaining 8% were neutral about the management plan).

Responses to the PACE-IT survey indicate that some participants found the initiation of calls challenging, sometimes due to network issues. Most appreciated the person-centred approach of the service in relieving anxiety among residents. Visual telehealth calls were considered useful in avoiding unnecessary transfers, and some respondents suggested assigning dedicated devices for these calls. The service was seen as a positive step toward a more person-centred care approach and praised for providing better decision-making support, despite occasional audio and video connectivity issues. Participants reported an overall positive experience with the PACE-IT MoC and expressed a desire for weekend service availability and to expanding the service to more departments, such as mental health and dental clinics. Additionally, the MOC was rated as improving communication between the resident, RACF and ASET nurse.

**Follow-up phone calls to RACF staff 24 hours after a VTC with no ED presentation.**

There were 40 VTCs where the RACF resident did not visit the ED. Follow-up phone calls were conducted with RACF staff 24 hours after a VTC for all eligible residents. RACF staff were asked questions about the health/wellbeing of the resident. Of the RACF responders, 34 (83%) were registered nurses. The average age of the resident was 86, ranging from 62 to 99 years. Table 6.5 describes the follow-up questions and responses. This is a different quality measure than the 48-hour ED presentation data obtained from following the resident's medical record number to ascertain if they presented to the ED within 48 hours of a VTC. Of the 40 who responded to the questions, 37 (92%) felt the resident's condition had remained stable or had improved. For Question 2, 20 responses (51%) were positive, indicating a consultation summary plan had been received. For Questions 3 to 6, over 95% of responses were positive.

**Table 6.5***Responses to 24-Hour Follow-Up Phone Calls to RACF Staff Following a VTC*

Follow-up questions		N	Deteriorated	Improved	Stable
1	How has the resident been feeling since our visual telehealth consultation yesterday?	40	8%	37%	55%
		N	No	Yes	No
		response			
2	Did you receive the Visual Telehealth Consultation summary plan?	39	1	51%	49%
3	Were you able to follow the Visual Telehealth Consultation plan?	37	3	95%	5%
4	Did the Visual Telehealth Consultation plan address all the issues for the resident?	37	3	97%	3%
5	Do you have any concerns about the treatment plan for the resident?	38	2	3%	97%
6	Are you happy to continue on the current plan for the resident?	39	1	95%	5%

\* Not all questions were answered by all participants, so the denominator varies.

### 6.2.3 Discussion

The PACE-IT project analysis demonstrated that, with the addition of VTC to the usual MOC, there was an overall 29% relative reduction of the rate of ED presentations (per 100 RACF beds) when an ED ACE/VTC call was made within ED ACE hours (when this service is accessible). This result was not statistically significant; however, it represents a clinically important decrease in exposure of RACF residents to the ED environment. All episodes of care from RACFs were supposed to have an ACE call to the ED prior to attending the ED. Pre-implementation, 333 episodes of care occurred in ED ACE hours, only

98 of these had a prior ACE call made to the ED (29% of episodes of care). Post-implementation, 421 episodes of care occurred in ED ACE hours, and 222 of these had an ED ACE/VTC (53% of episodes occurring within ED ACE hours), reflecting a highly significant increase in the use of the ED ACE service, with or without VTC.

The study aimed to detect a 35% reduction in ED presentations per 100 RACF beds from a baseline rate of 82 ED presentations per 100 beds, which was both clinically meaningful and practical. The observed 29% reduction, while not statistically significant, may be due to limited statistical power caused by a slightly smaller true effect and the lower baseline rate of ED presentations (around 41 per 100 RACF beds annually). The PACE-IT project started in 2019 during the COVID-19 pandemic, which led to fewer ED visits overall.

This 29% reduction in ED presentations highlights the benefits of dedicated, constant support and education through visual assessments. Notably, the most significant reduction in hospital transfers (29%) occurred when ASET nurses conducted VTCs during ED ACE hours, in contrast to a 4% reduction during non-ED ACE and ED ACE hours combined. These findings suggest the potential to expand ASET nurse/ED ACE hours for more comprehensive coverage throughout the day and evening. Findings demonstrate that when RACF nurses undertake ED ACE/VTCs there is a reduction in RACF resident ED visits.

Successful implementation relies on RACF staff's willingness and motivation to utilise the ACE service and the visual component of the consultation. VTCs helped develop relationships between RACF and ED nurses (Sunner et al., 2022) and these synergies further act to normalise ED ACE/VTC and facilitate its adoption as usual care. This is evidenced through the survey results where 100% of respondents indicated that the VTC service enhanced communication and 97% felt it provided a person-centred approach. Further motivation for RACF staff to utilise VTC is the fact that the resident has access to an additional benefit of advanced levels of care that support and strengthen care decision-

making processes including the perceived access to specialised care using VTC. When dealing with complex or acute health issues that exceed the scope of routine care, RACF nurses may see the value in involving ACE/VTC to consult with experienced clinicians, including Emergency Department doctors. This access to expert guidance can empower nurses and enhance the quality of care provided to residents.

Post-implementation the top five reasons for VTC calls for ED presentations from RACF residents were for; abdominal pain, chest pain, acute upper respiratory infection, low back pain, urinary tract infection. However not all ACE calls were deemed appropriate for VTC. There were times where VTC was deemed inappropriate, for example, if the resident had; an exacerbation of behavioural and psychological symptoms of dementia with excessive aggression that would be further agitated by a VTC, evidence of a haemorrhage, excessive pain, unexpected loss of consciousness/ sense of urgency, actively fitting/ seizure or simply a follow up call (e.g. medication script, x-ray report etc). For this reason, it was important to allow for staff discretion and flexibility in choosing whether to use VTC during the ACE call and this needs to be considered by staff in both the ED and the RACF. Based on post-implementation feedback exclusion criteria have been developed and added to VTC guidelines.

There were many missed VTC opportunities for which the RACF nurses presented a range of responses including: the iPad was not charged or no compatible device was available for a VTC, there was an agency nurse on duty who was new and not familiar with the procedure, the RACF nurse refused to attend a VTC as they were not trained, there was a technical system failure, the resident was already in an ambulance and on their way to hospital and the staff were “just handing over”.

Including a VTC option as part of an assessment service for RACF residents that enhances telephone outreach services is a practical strategy. Nurse-led outreach models that

include partnerships between ED and RACFs using existing ED Aged Care Specialist services, together with protocol driven guidelines have been shown to be both feasible (ACI, 2021; Conway et al., 2015; Hullick et al., 2016) and cost effective (Ling et al., 2019). Our project was implemented with existing stable Wi-Fi in all facilities and inexpensive accessible tablet-based technology. The low numbers of residents with unplanned presentations to the ED within 48 hours of a VTC (where a same-day ED presentation was not made) suggests this MOC provides a safe high quality care options in the management of residents.

The PACE-IT intervention has the potential to improve the clinical care and quality of life of the frail older person and reduce ED presentations and their associated risks. It has provided evidence that can be used to inform sustainable change and translation into practice. PACE-IT has demonstrated how the change has been achieved and highlighted success factors for scalability and sustainability. Specifically, it has identified how PACE-IT reduces ED presentations and admissions to hospital for residents of RACFs (Hofmeyer et al., 2016). It will inform the review of processes and the development of Policy and Guidelines that will integrate PACE-IT into existing service models.

These findings have direct clinical implications as well as policy implications for those setting standards for the Australian National Safety and Quality Health Service Standards (ACHS, 2015). In particular, Standard 5, “Comprehensive Care” for RACF residents, ensuring clinically appropriate care at the right time in the right place that meets individual’s needs and wishes, and reduces risk of harm. Alongside this is Standard 2 “Partnering with Consumers” (ACHS, 2015) where visual telehealth links positive patient experiences, high-quality health care and improved health care safety. The continuation of the service and how policy can be modified to support ongoing implementation will be the ongoing concern.



This study has provided evidence for translation by generating new knowledge about how PACE-IT, provided to RACF residents with a general range of acute conditions, reduces ED presentations. The PACE-IT intervention can be transferred to many settings within metropolitan, rural and remote areas and in differently sized EDs and RACFs. However, the challenge is to ensure current interventions are embedded as normal practice to ensure that similar MOC are sustained into the future. Challenges include the lack of ongoing funding to scale up the intervention, incentives for implementation of leadership in this area and availability of appropriate champions to influence successful implementation and outcomes, common issues found in other studies (Chen et al., 2013; Hullick et al., 2022) . Furthermore, the competing workloads, lack of training for RACF nurses, depleting aged care workforce (Winzar, 2022) and insufficient medical back up and support can also hamper the translatability into routine care.

PACE-IT establishes a governance structure that engages all stakeholders (including consumer representation), a structure that is easily replicable nationally. Current members of the PACE-IT governance group have enthusiastically embraced their role in developing the study design and PACE-IT model and in making themselves available for consultation, indicating a high level of engagement and ongoing commitment. Establishment of the VTC upskilling education program and additional resources (e.g., Guidelines, RACF unit-posters, resident/family information brochures, media-briefing) will facilitate local engagement ensuring easy transfer and adaptability of PACE-IT across sites/LHDs. Integral to the success of this MOC is dedicated leadership that can drive the intervention and have time to review the processes and data whilst continuing to educate and liaise with ASET and RACF nurses.

Once embedded, EDs across NSW may consider expanding to a 24/7 ACE service which would require additional resourcing. The cost/consequence analysis in this study (to be reported separately) will inform the feasibility of this action.

This study represents a significant contribution to the literature by both presenting its findings and outlining a novel approach in providing care for RACF residents. The adoption of VTC has demonstrated a noteworthy reduction in hospital admissions for residents of residential aged care facilities, underscoring its clinical significance. These findings strongly support the broader implementation of visual telehealth consultations. This justification emphasises the importance of integrating VTC as a vital tool to aid RACF clinicians in their decision-making processes.

#### **6.2.4 Strengths and limitations**

Different methods of data collection were utilised for this study to ensure rigour. Primary outcome data measuring RACF ED presentations and VTCs was collected monthly from the PMS and included information on demographic characteristics of RACF residents, presenting problems and call outcome (ED presentation or alternative care pathway). The generalisability of this study was ensured by engaging with different locations and contexts and selecting EDs for their metropolitan and rural locations.

At any given time, the randomised mixture of sites ensured that some sites had the intervention, and some did not, thus accounting for secular variations. The fixed effect for the step will control for a common underlying secular trend across all clusters (Hemming et al., 2015).

The study was unlikely to have achieved the planned statistical power due to the lower overall rate of ED presentations—resulting from the COVID-19 pandemic and subsequent lockdowns—and a slightly lower-than-anticipated intervention effect. However, while not statistically significant, the 29% overall reduction in ED presentations per 100 RACF beds demonstrates an important clinical effect.

### 6.2.5 Conclusion

Despite the implementation of the study becoming hampered by the onset of COVID-19, study findings have shown feasibility and clinically significant reductions in RACF resident ED presentations when VTC is included in communications between RACFs and EDs. This clinical significance cannot be understated. Any reduction of resident presentations to a busy ED is of huge benefit to healthcare overall, but more so to the individual older person who can recover safely in their own RACF.

For abbreviations and definitions utilised in this paper please refer to Table 6.6 below.

**Table 6.6**

#### *Abbreviations and definitions*

<b>ACE</b>	Aged care emergency telephone only calls from RACF for consultation, provided 24 hours a day, by the ASET nurse in the ED from 8-4pm and after hours by a separate health care provider
<b>ED ACE</b>	Within ASET rostered hours: Monday to Friday, 8 am to 4 pm
<b>non-ED ACE</b>	a separate health care provider for after-hours ACE calls
<b>VTC</b>	Visual Telehealth Consultation is an ED ACE call with the addition of a video conferencing platform for interactive assessment and clinical decision making
<b>ED ACE/VTC</b>	An ED ACE telephone call with or without a VTC
<b>ED</b>	Emergency Department
<b>ED presentation</b>	An ED presentation was defined as an RACF resident transfer to ED (“in-person” presentation to the ED).
<b>Episode of care</b>	An episode of care includes all instances where an ED medical record was created for a RACF resident when the resident was transferred to the ED, with or without an ED ACE call/VTC, or when an ED ACE/VTC was attended with no resident transfer to the ED
<b>GP</b>	General Practitioner
<b>IRR</b>	incidence rate ratio
<b>OR</b>	Odds ratio
<b>LHD</b>	Local Health District

<b>MOH</b>	Ministry of Health
<b>PACE-IT</b>	Partnerships in Aged Care Emergency using Interactive Telehealth
<b>PMS</b>	Patient Management System
<b>RACF</b>	Residential Aged Care Facility
<b>TUQ</b>	Telehealth Usability Questionnaire
<b>48 hour presentation</b>	an “in-person” presentation to the ED within 48 hours, but not on the same day, following a VTC where the resident did not attend the ED
<b>Unnecessary ED - Presentation</b>	An unnecessary Emergency Department (ED) presentation refers to a situation in which an individual seeks care or treatment at an ED for a medical condition or issue that could have been adequately addressed and managed in the a less acute setting e.g. the RACF.

**For supplementary files, see the appendices at the end of this thesis**

Appendix K: Supplementary File 1: The essential elements of ACE with the addition of VTC

Appendix B: Supplementary File 2: ISBAR

Appendix L: Supplementary File 3: ACE and VTC flow chart

Appendix M: Supplementary File 4: Implementation strategies

Appendix A: Supplementary File 5: The PACE-IT Research Project Staff Survey

## **6.3 Summary**

The findings presented in this chapter have provided strong evidence that unequivocally establishes the feasibility of integrating VTCs into healthcare policies to improve the comprehensive care of residents in RACFs. The evidence highlights the potential for significant hospital avoidance strategies and improved resident clinical outcomes but also underscores the pressing need to embrace VTC as an integral part of our healthcare system. Using the stepped wedge cluster randomised trial design was the most effective way to

implement this complex study across 16 RACFs and 4 EDs. The study has demonstrated high adoption rates for VTC during the two years of data collection.

However, since data collection and the trial coordinator position ceased, there has been a subsequent decline in the use of the PACE-IT MOC. Consequently, revisiting and delving deeper into the steps involved in integrating the NPT within the PACE-IT implementation plan is imperative. In the next chapter, the NPT is reviewed and a comprehensive framework known as the NASSS framework (Greenhalgh et al., 2017) is applied, which offers a structured approach to examine the multifaceted factors that could impinge upon the future of VTC in the ED/RACF setting. The NASSS framework investigates long-term implications and challenges, providing invaluable insights essential for navigating the complexities associated with the integration and sustained utilisation of VTC in healthcare settings.

## **Chapter 7: The discussion—sustainability**

This final chapter is a synthesis of the study findings and considers the sustainability of using VTCs to enhance decision-making when considering the transfer of RACF residents to the ED. The synthesis addresses one fundamental question: Is the PACE-IT a sustainable, routine part of practice and well-integrated into the four EDs and 16 RACFs recruited into this study? In addressing this inquiry, solutions for sustaining adoption and planning the scale-up or rollout were determined through the application of the Non-Adoption, Abandonment, Spread, Scale-Up, and Sustainability (NASSS) framework.

In this chapter a reflection is provided on how the normalisation process theory (NPT) underpinned the development and implementation of the PACE-IT study since NPT aims to achieve normalisation or sustainability of the intervention in practice. In August 2021, at the completion of this project, the candidate returned to her substantive role as an ASET nurse in the ED. However, VTC was not being used consistently across the 16 RACFs and the two LHD EDs as intended, according to the meticulously planned implementation process that was crucial to the research. This was confirmed in a sustainability forum held in March 2023, where the ensuing discussion confirmed concerns about the sustainability of the PACE-IT MOC. The fact that the PACE-IT MOC was not embedded into routine care prompted a contemplation on NPT and considerations on how the implementation could have been enhanced. Subsequently, the seven domains of the NASSS framework (Greenhalgh et al., 2017) might provide further insights into PACE-IT's sustainability. The candidate provides a critical reflection on what worked and what did not work with the implementation of the PACE-IT MOC, the underpinning reasons for this and suggestions for future implementation research, alongside the implications for policy and practice and the strengths and limitations of implementing the PACE-IT MOC.

## **7.1 Normalisation process theory applied to the implementation of PACE-IT**

As described in Chapter 3, normalisation process theory (NPT) provided a framework to ensure that the implementation of VTC became part of usual care by addressing each of the four framework components, including coherence, cognitive participation, collective action and reflexive monitoring (Murray et al., 2010). This framework was particularly salient in the PACE-IT study due to the complexity of the healthcare settings and the layers of key stakeholder involvement. In the following section, how the NPT guided the whole study is discussed.

The first NPT component of coherence describes the assessment process or the ‘sense making’ of the intervention (Murray et al., 2010), where the candidate sought to understand how telehealth could be used to augment the ED ACE service and potentially reduce unnecessary transfers of RACF residents to the ED. As described in Chapter 1, before starting the PACE-IT project, informal interviews of ASET nurses and other stakeholders, including RACF nurses and ED managers were undertaken, to understand the issues related to unnecessary transfers of residents to the ED. An audit of the health service ED data about hospital presentations for RACF residents and discovered that RACF residents were still unnecessarily coming to the ED. This discovery led to considering augmenting the existing ACE service with visual telehealth. Negotiations were made to undertake a small pilot study (unpublished) in my own ED to examine the feasibility and real benefits of augmenting the ED ACE with telehealth. The small pilot study suggested that the two RACFs that participated had reduced resident ED presentations after the introduction of VTC.

Following the pilot study, an exploration of the literature was undertaken to identify if telehealth improved the decision-making surrounding transfers of RACF residents to ED. Initially, a preliminary literature review was conducted with the guidance of the hospital



librarian. Later, the candidate conducted a formal scoping review that was published and is included in Chapter 2 (Sunner et al., 2022). The current evidence indicated that visual telehealth effectively prevented unnecessary RACF-resident presentations to ED. Many different disciplines were using visual telehealth. However, no nurse-led MOC had used VTC with RACFs directly from the ED.

An unexpected part of the “sense making” was the COVID-19 pandemic. The study described in Chapter 4 was designed to understand the concerns for RACFs preparing for a pandemic and whether or how the introduction of VTC in the RACFs would still be feasible and helpful. The learnings from this study further informed the PACE-IT research team as to how they could then support the research participants in the rapidly changing clinical landscape.

Making sense of how an MOC, the PACE-IT intervention, could work took at least a year of investigation, a fact that is seldom visible when describing a study. At the end of this phase, the design of the PACE-IT intervention was established as feasible and was ready to move on to the next stage.

The second NPT component, cognitive participation (or engagement), was addressed through engaging with representatives of all key stakeholders, including RACF residents, encouraging them to participate and contribute to the design and refinement of the PACE-IT intervention and to assist with developing the implementation plan. As described in Chapter 3, continued engagement occurred throughout the project with regular implementation meetings. The value of having implementation meetings was that shared conversations helped all stakeholders understand potential barriers and enablers of the project. Further, these meetings helped to facilitate working relationships between the RACF and ED nurses. There were also formalised meetings for all levels of stakeholders, including RACF and ASET nurse champions, RACF and ED managers, ACE operational/governance

group and a steering/advisory committee with executive-level engagement from the LHD up to the NSW Ministry of Health and other key state health and education related organisations. Establishing wide stakeholder engagement was a crucial step in the project.

The third NPT component, collective action (work done to enable the intervention to happen), was the implementation phase of PACE-IT. The published study protocol (Chapter 3) described the carefully structured stepped wedge cluster RCT to introduce the intervention. The intervention was to be introduced by randomly assigning two RACFs and their associated ED monthly for eight months. However, simply introducing PACE-IT was only a first step. The implementation required a constant assessment of the acceptability and usability of VTC (using a survey as detailed in Chapters 3 and 6, Appendix A) and dissemination of the project progress via newsletters (Appendix C), meetings and emails. Continuous adaptations evolved during this process based on feedback, which saw the adoption of VTC by incorporating handheld devices or smartphones and establishing a QR code to link to the telehealth platform to fit RACF resource availability. To ensure the research team kept on top of any technical or other unanticipated implementation issues, the candidate received daily reports of PACE-IT/ACE calls to follow up promptly if technical issues or barriers were identified. For example, reducing the time lag between the ACE telephone call and the connection on VTC was inspired by an idea discussed at an implementation meeting. The refinement was a direction to the ASET nurse to stay on the telephone with the RACF nurse and talk them through the process of connecting to a VTC. Another aspect of NPT was the introduction of a notification letter to GPs and RACFs to ensure the resident's management plan was properly conveyed to the RACF and the resident's GP. The introduction of the 24-hour follow-up telephone call from the ED ASET nurse to the RACF also ensured that the management plan was appropriate for the resident.

The result of all these actions was a clear picture of the barriers and enablers to implementing VTC and real-time adjustments to facilitate the ease of using it.

The fourth NPT component, reflexive monitoring (formal and informal appraisal), included an electronic survey for RACF nurses (described in Chapters 3 and 6 and Appendix A) to keep abreast of technical issues in real time. The workplace champions in the EDs and the RACFs acted as single contact points for feedback to the research team, managed via email or telephone calls and physical visits to the facility if necessary. Users received regular communication, support and motivation, which helped to integrate VTCs as routine practice. Daily emails were sent to report the usage of VTC, which kept the project coordinator informed and enhanced the support and communication to drive the project. The 24-hour follow-up phone call (reported in the electronic information patient management system [iPMS], which became part of the resident's medical record) ensured timely assessment of the resident's condition and reassured both ED and RACF nurses that there was a monitoring process in place to ensure the resident's safety throughout the project.

The NPT theory underpinned the implementation of the PACE-IT project and was used to ensure the VTC intervention was not only successful but also adopted as usual care. As detailed in Chapter 6, the PACE-IT MOC was successful, but there is now evidence of multiple challenges to ensuring its sustainability, which are explored in the next section.

## **7.2 Sustainability**

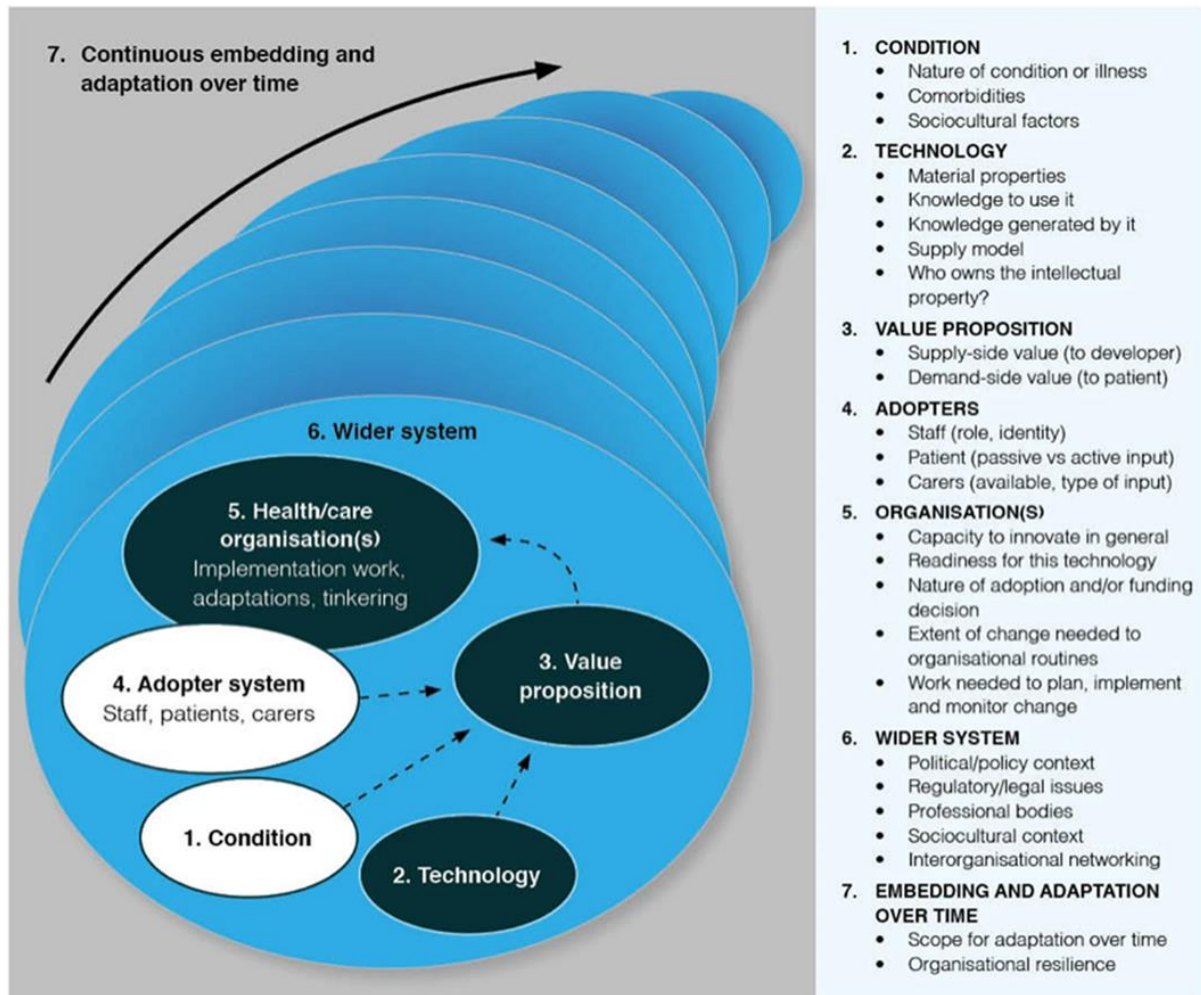
To carefully examine the sustainability of the MOC, the NASSS framework was chosen to interrogate the PACE-IT implementation and outcomes. Greenhalgh et al. (2017) provided guidance for evaluating the success of technology-supported health programs and offered insights into how telehealth projects such as PACE-IT can be implemented effectively and sustainably.

### **7.3 The non-adoption, abandonment, spread, scale-up and sustainability framework**

The authors assert that the non-adoption, abandonment, spread, scale-up and sustainability (NASSS) framework can be applied across various technological innovations in health care (Greenhalgh et al., 2017). The NASSS can inform the design of new technology, identify solutions to sustaining adoption, plan the scale-up or rollout of a technology program and explain and learn from program failures (Greenhalgh et al., 2017). In this chapter, the seven domains of the NASSS framework, as detailed in Figure 7.1, are applied to the PACE-IT study implementation approach.

**Figure 7.1**

*The Seven Domains of the NASSS Framework for Considering Influences on the Adoption, Non-Adoption, Abandonment, Spread, Scale-Up and Sustainability of Patient-Facing Health and Care Technologies (Greenhalgh et al., 2017, p. 11)*



### 7.3.1 Domain One: Condition

The first domain of the NASSS framework involves developing a profound comprehension of the specific condition under consideration. In this study, the ‘condition’ of concern was the avoidance of unnecessary hospital admissions for residents of RACFs. As an experienced ASET nurse working in the ED, the candidate had a reasonable understanding of safe hospital avoidance strategies for RACF residents using VTC technology to improve communication between the ED and RACF staff and residents. The candidate focused on

how to improve bi-directional communication between the RACF and ED. However, upon further exploration to comprehend the 'condition,' a variety of factors influencing the health of RACF residents were identified. In addressing NASSS Domains 4, 5 and 6, concerns were broadened, not only regarding the health condition but also to workforce, workload and resources, and the addition of pandemic restrictions, when the RACF resident is being considered for transfer to the ED. Applying the NPT to the design of the PACE-IT study and piloting the intervention provided important insights into the condition of concern, and strategies were put into place to address challenges prior to their occurrence or in real time, as they arose during the study.

### **7.3.2 Domain Two: Technology**

An examination of the second domain, the technology used to treat the illness or condition, identified several significant issues during the PACE-IT study that needed to be addressed. These included issues surrounding technology hardware and access and staffing resources in both RACFs and EDs involved in this study, as described in Chapters 4 and 5. The candidate proposes that these challenges are representative of what may be encountered in other settings when implementing the PACE-IT MOC on a larger scale.

#### ***7.3.2.1 Technology hardware***

To ensure that the RACFs were in a state of readiness for VTC implementation, the RACF managers signed a letter of agreement stating that they would provide the equipment needed for the PACE-IT intervention. Despite this written commitment, nurses revealed that, at times, the equipment was either unavailable, not charged and ready to use, or incompatible with the partnering LHD VTC platform, as reported in Chapter 5. This was similar to the findings of a recently published USA-based study (not available at the time of the scoping review), where eight of nine RACFs experienced difficulties accessing the hardware and equipment required to undertake a telehealth consultation (Ford et al., 2022).

### **7.3.2.2 Technology access**

The internet coverage in the RACFs was prioritised to the nurse's station but not necessarily accessible at the resident's bedside which posed many challenges and barriers to including the resident in the VTC. As detailed in Chapters 4 and 5, poor Wi-Fi and internet access while using VTC in RACFs posed many connectivity and pixelation issues, resulting in impaired vision and audio connectivity while assessing residents. The connectivity issues with substandard internet in RACFs consideration of the inequities in health care for vulnerable older people. Substandard internet and access to equipment hampered RACF nurses' involvement and, more importantly, the resident's involvement in a VTC. Further, RACF nurses sometimes could not locate a handheld device to undertake a VTC, a crucial tool for this MOC.

These issues were also raised during the Australian Royal Commission into Aged Care Quality and Safety (2021a), with Recommendation 109 identifying that assistive technologies and smart technologies should be utilised to support the care and functional needs of older individuals, manage safety and improve their quality of life. The Royal Commission asserted that these technologies 'should be universally available, enabled through internet and Wi-Fi access, and funded by the Australian government' (Royal Commission into Aged Care Quality and Safety, 2021a, p. 283). Further, technologies should be implemented in older individuals' homes to aid in providing care and enhancing their social engagement. This means the technology should be easily accessible and not locked in a cupboard with no key to enable access, as in some of the participating RACFs.

Further investment and development of improvement strategies for VTC connectivity in underserviced areas are urgently needed for the future usability and sustainability of this MOC, a problem not just confined to this research project. In a recently published systematic review and synthesis guided by the NASSS framework, technical challenges were found to



restrict sustainability, including the lack of reliable video conferencing technology, audio or video interruption/failure, inadequate maintenance and unreliable internet accessibility or bandwidth (James et al., 2021).

In the PACE-IT study, all 16 RACFs reported internet connectivity challenges. Two of these facilities specifically mentioned that their Wi-Fi infrastructure was inadequate due to the age and design of their buildings. Interestingly, even a newly constructed RACF building had an unreliable internet connection, which underlines the low priority of providing access to contemporary technology for vulnerable older people. Some of the internet connectivity issues may be resolved over time as Australia's internet system transitions more broadly to increase coverage for everyone. Overall, implementing telehealth technology requires a holistic approach that considers efficient technology, equipment and sufficient numbers of digitally enabled staff to drive the technology.

#### ***7.3.2.3 Staffing resources***

The implementation plan included a structured education session plan for all staff as detailed in Chapter 3, the study protocol, and in Appendix E. Training and ongoing support were made available to ensure all users in both the RACFs and EDs were familiar with the process and could easily access the VTC platforms and use the technology effectively. The training was handed to designated RACF and ED nurses called champions to continue the education and feedback issues to the project team. However, when the candidate returned to the position as an ASET nurse, the champions had left the RACF. Interactions were with RACF nurses who were either new to the role, were casual or agency nurses, or had never heard of VTC. Consequently, without the support from the champions in the RACFs, nurses required clear instructions on the VTC process over the telephone, an extremely time-consuming process and inefficient use of resources for all concerned.

### **7.3.3 Domain Three: Value propositions**

The third domain, value propositions, refers to a simple statement summarising why the two main stakeholders (from the ED and RACF) would choose to use VTC to aid their decision-making concerning the transfer of a resident to the ED. The two perspectives to be considered are those of the RACF nurse and resident (on the downstream, the demand side) and the ED/LHD (on the upstream, the supply side).

The upstream value for the LHD is that the PACE-IT MOC provides efficacy, safety and good value for money. The PACE-IT MOC offers a unique solution to the challenge of keeping RACF residents safe from unnecessary transfers to the ED. The data findings support the potential of VTC in improving resident hospital avoidance, as mentioned in Chapter 6. By normalising and embracing VTC as part of usual everyday care for residents in RACFs, the LHD demonstrates its commitment to enhancing the quality of care, reducing unnecessary transfers and providing a higher level of support to nurses working in RACFs. Further, LHDs are also aligning with directives and priorities set by the Ministry of Health (MOH) to maximise the use of virtual healthcare delivery, thereby alleviating the strain on already overburdened EDs.

The downstream value the PACE-IT MOC provides is the benefit for residents with real-world affordability. By valuing and adopting VTC, LHDs commit to solving the problem of unnecessary resident transfers to the ED. This further empowers RACF nurses, giving them the tools and support they need to make informed decisions, provide comprehensive care within the facility and help increase their confidence. It also helps by offering ongoing education and support and fostering relationships of trust. VTC is a powerful ally in supporting the decision-making process of RACF nurses, as found in Chapter 5, enhancing communication and ensuring that experienced care remains with the residents whenever possible.

In contemplating Domain 2, it was found that VTC became more and more time consuming due to many factors; the constant change in staffing, the ED and RACFs workload increase, and the time needed to retrain all the staff how to connect to a VTC became prohibitive. A salient point when considering Domains 5, 6 and 7 and the need to have nursing workflow and easy technology infrastructure valued and prioritised. A perplexing issue when LHD, state and national priorities aim to deliver more home, community and virtual settings services and accelerate digital investments in systems and infrastructure (NSW Health, 2016, 2022).

#### **7.3.4 Domain Four: Adopters**

The fourth domain of the NASSS framework, adopters, refers to the people who will be using the technology. In the context of the PACE-IT MOC, ‘adopters’ primarily included RACF and ASET nurses and RACF residents.

Identifying the roles of staff involved and ensuring that they have the necessary skills and resources to implement the technology effectively is critical to both success and sustainability. The main strategy used was to initially motivate the nurses in both settings to view this intervention as critically important in keeping residents safe in their own homes and avoiding risky transfers to the ED if their care could be provided in the RACF. The second strategy was to provide ongoing support to assist the nurses in learning how to use the VTC with ease so that it would become embedded in practice as the first step in managing residents when considering transfer to the ED. However, there were barriers to the adoption of VTC.

As described in Domain Two, one major barrier to adoption was the absence of a stable workforce and a shortage of experienced and qualified RACF staff available to carry out the necessary tasks related to the use of VTC. The issue of workforce shortage in aged care was recently highlighted by the Committee for Economic Development in Australia

(Winzar, 2022), and the impact of COVID-19, findings in Chapter 4, with projections indicating that 65,000 workers are leaving the aged care sector each year, with 20% of workers projected to leave in the next 12 months and 38% in the next five years. Earlier, this issue was also recognised in the eHealth Strategy for NSW Health (NSW Health, 2016), which identified workforce shifts as a key driver for change. The critical workforce shortage in aged care was identified as a major issue affecting the sustainability and scalability of the PACE-IT MOC. The very recent Australian federal government initiative to address RACF staff shortages has seen a wage increase of 15%, which may help ensure sufficient workforce is available to implement, sustain and scale up the PACE-IT initiative in the future (DoHAC, 2023).

The residents and their families or carers had a largely passive input into the issue of transfer to the ED. However, there were a few instances where residents/family members or carers actively communicated with the RACF and ED staff using PACE-IT technology.

### **7.3.5 Domain Five: Organisations**

The organisations to be considered in this domain are two separate entities—the LHDs and the RACFs. The LHD organisations supported this project all along; from contacting the nursing unit manager to ask for her sponsorship until the study proposal was pitched to the leadership groups and converted the idea into a Translational Research Grants Scheme proposal and throughout the implementation.

The PACE-IT MOC planned strategies that ensured scale-up, spread and sustainability with the help of a project coordinator to drive implementation and evaluation, PACE-IT champions in each RACF and LHD, a well-developed implementation education workshop, a PACE-IT toolkit and feedback mechanisms. These strategies are considered effective interventions because they address how the organisation might respond to evolving challenges and how innovation coexists with organisational processes (Greenhalgh et al.,

2017). Ongoing project coordination and high-level leadership from RACFs and LHDs were considered essential to continue supporting PACE-IT uptake.

The PACE-IT MOC represents a capacity to innovate and implement an approach to healthcare delivery in the aged care setting. Part of the NPT acknowledges that sense-making and coherence are necessary to build the organisation's shared vision of the VTC's strengths and limitations (Greenhalgh et al., 2017; May & Finch, 2009). This shared vision was established by aligning PACE-IT with key local and state priorities. An example of this would be eHealth applications such as VTC with the NSW MOH's Key Performance Indicators (Health Hunter New England Local Health District [HNELHD], 2022), including delivering safe care across all settings (Health Outcome 2) and managing the health system sustainably (Health Outcome 6).

The NASSS framework asserts that organisations with a strong readiness for technology, including access to necessary equipment and resources, may be more prepared to implement innovations such as the PACE-IT MOC. In this study, there was no way to predict the lack of readiness for the technology identified and the organisational barriers encountered in both LHDs and RACFs when implementing the PACE-IT project. These organisational barriers were detailed in Chapter 5 of this thesis under the NASSS Domain 2. Assessing the readiness for technology could have enhanced preparation for PACE-IT, which would have relieved many of the barriers that continue to be experienced.

The nature of the adoption/funding decisions can impact the level of resources and support available for planning, implementing and monitoring change. The decision by the two LHDs to adopt the PACE-IT project was influenced by various factors, such as the availability of funding provided through the Translational Research Grants Scheme, organisational priorities and stakeholder support. During the PACE-IT research project, the candidate was employed as a full-time project coordinator to closely monitor all interactions

and any missed VTC opportunities, providing real-time support as needed. By consistently addressing unplanned barriers as the project coordinator was able to apply implementation strategies that involved ‘taming’ the technology (Greenhalgh et al., 2017). Since the end of the project, this level of coordination has been absent, with the result that there is now little engagement with VTC between EDs and RACFs.

The extent of change needed also affects the level of planning, resources and support required for the successful implementation of innovation in this field. The PACE-IT LHDs were supportive and cognisant of the impact VTC could have on hospital admissions from RACFs due to the success of the unpublished pilot study in 2018. Implementing the PACE-IT MOC required significant changes to organisational routines and processes. Established work routines in the RACF and the ED were disrupted by the new VTC technology, requiring further support and transition to implement this intervention. Implementation is not a finite business; it is ongoing, and more resources are needed to plan future sustainability strategies. An economic evaluation of the impact of PACE-IT currently underway may strengthen the argument for the further spread of VTC. This is planned to be published later in 2023.

The PACE-IT MOC required significant work to plan, implement and monitor change. To ensure sustainability, organisations must have the necessary resources, expertise and support in place to successfully adopt and implement the MOC and support the staff involved in making the required change—and this support must be ongoing. The use of champions is vital in managing the complexities of telehealth (James et al., 2021) and for the ongoing sustainability of VTC. Another strategy crucial for sustainability is to ensure the application of VTC is user-friendly, so streamlining the VTC process must become a priority. Other authors also assert that integrating VTC into service planning and healthcare redesign would make it more like ‘business as usual’ (Jury & Kornberg, 2016, p. 502).

Overall, the successful implementation of the PACE-IT MOC required careful consideration of an organisation's capacity for innovation, readiness for technology, funding decisions, the extent of change needed and the work needed to plan, implement and monitor change.

### **7.3.6 Domain Six: The wider systems**

The concept of the wider systems in Domain 6 requires considering the political, economic, regulatory, professional (e.g., medicolegal) and sociocultural contexts that influenced the PACE-IT rollout. As asserted by Greenhalgh et al. (2017), the wider context often plays a crucial role in moving from a successful project to a mainstream service that is sustainable in the long term.

There were many health service-related strategic plans and directions from national, state and local political bodies that aligned with the PACE-IT project and supported VTC in RACF and ED settings as an essential workflow strategy for hospital avoidance, eHealth and partnering with consumers (HNELHD, 2022). These were discussed in Chapters 3 and 6.

One issue that arose was that the use of the visual telehealth platform by GPs was not regulated or secure at times. Security is crucial because, similar to a regular consultation, safeguarding privacy is of the utmost importance to both patients and practitioners (Adam, 2020). The Australian Government is currently working with telecommunication experts to redesign telehealth services to provide improved links between all Australians and their GPs in the future (Australian National Consultative Committee on Electronic Health, 2018).

Finally, inter-organisational networking is critical for the successful implementation of telehealth technologies. Collaboration between healthcare organisations and providers is necessary to ensure that the PACE-IT MOC is integrated into existing care models. Effective communication and coordination between providers and organisations are essential to ensure that residents receive high-quality and coordinated care with providers such as the



NSW/national ambulance service, GPs and the primary health networks. In this study, there were many collaborations with many industry partners, consumers, RACFs, LHD managers, and RACF and ASET nurses to ensure that the PACE-IT project interfaced with their expectations and needs, described in Chapter 3.

### **7.3.7 Domain Seven: Embedding and adapting over time**

Embedding and adapting over time is essential for effective scale-up, spread and sustainability, and, as previously mentioned in Domain 5, it is impossible to predict the extent of this at the outset (Greenhalgh et al., 2017). There are two main areas to consider when it comes to embedding and adapting over time. There is scope for further steps to embed PACE-IT into RACFs and EDs and for adaptation to occur over time. There is also a need for the organisations involved to become more agile and responsive to the implementation of eHealth strategies to address the healthcare needs of our ageing population. Strategies to address these two main areas are outlined in the following section.

#### ***7.3.7.1 Scope for adaptation over time***

The following recommendations should be considered to further elaborate on what PACE-IT telehealth needs for embedding the practice and adaptation over time.

**Make the process as easy as using the telephone:** The telehealth system should be user-friendly and intuitive, with clear instructions and minimal technical barriers. This can help to reduce user frustration and make it more likely that RACF and ASET nurses will continue to use the system over time. This requires:

1. quick and easy access—the system should be designed for quick and easy access, with minimal steps in the connection process or waiting times.
2. better internet—a reliable and fast internet connection is essential for VTC and should be prioritised in the design and implementation of the system.

**Workplace drivers:** There should be clear incentives and drivers for RACF nurses to use the system, such as streamlined workflows or improved patient outcomes. For example, the reinvigoration of champions and a project coordinator will drive further change. This can help to encourage adoption and reduce resistance to change.

**A consistent and skilled nurse workforce:** The system should be staffed by consistent and well-trained personnel in the RACFs and the ED, with clear protocols and guidelines in place to ensure continuity of care for the resident.

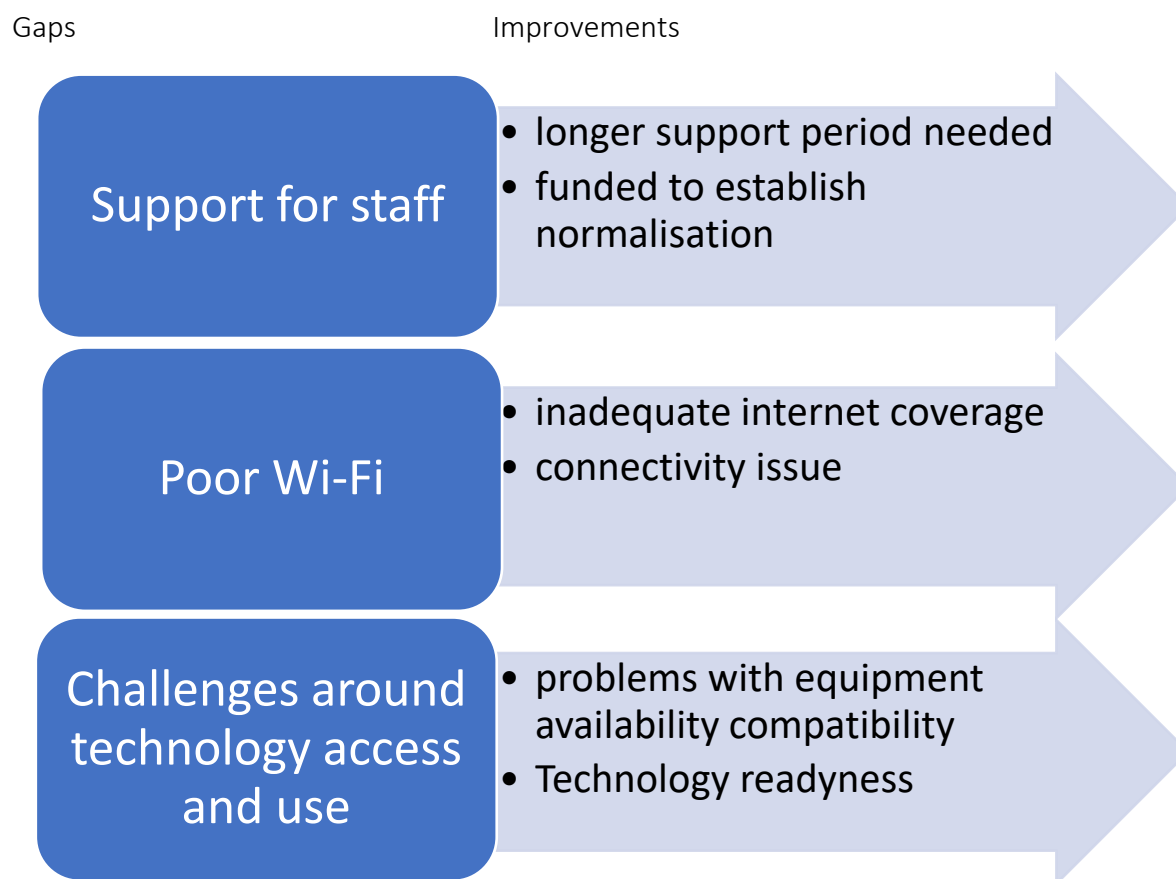
Embedding organisational resilience in visual telehealth requires the ability to quickly adapt to changing circumstances and a flexible and adaptive system designed to swiftly respond to altering conditions, such as modifications in residents' needs, new regulations or emerging technologies. This can be achieved with the following strategy:

**A central hub for expertise:** There should be a centralised VTC resource for expertise and support, such as a dedicated help desk or knowledge base. A centralised VTC resource can help to improve the efficiency of the system and reduce the burden on individual staff members in the ED and will further provide:

- efficient use of resources—the system should be designed to make the most efficient use of resources, such as nurses' time, data entry for new residents and easy access to equipment.
- strategies to mitigate staff turnover—the system should be designed with strategies in place to mitigate the effect of staff turnover, such as cross-training and clear protocols for handover.
- education that can upskill nurses quickly—the system should be designed with education and training resources that can quickly upskill nurses in new technologies or protocols. This can help to ensure that nurses are equipped to respond to changing circumstances and remain engaged in their work.

### **7.3.8 Summary of the non-adoption, abandonment, spread, scale-up and sustainability framework's findings**

The seven domains of the NASSS framework have enabled reflection on the threats to the PACE-IT MOC's sustainability. The two main gaps in sustainability are well illustrated in Domains 2 and 4, technology and adopters, respectively please see Figure 7.2. Domain 2 examined the issues surrounding the use of technology to treat the illness or condition in the PACE-IT study. These challenges included problems with equipment availability, compatibility and readiness, as well as inadequate internet coverage and connectivity issues in RACFs. The study also highlighted the importance of training and ongoing support for staff, particularly in the absence of designated champions who were responsible for education and feedback. The recent wage increase in aged care in Australia will go some of the way to help attract and retain nurses in the aged care sector. However, two concerns must be addressed to continue with a sustainability plan: adopting a clinical lead to drive the MOC and efficient and usable technology. Facilitating high-level research like the PACE-IT MOC will help provide further information and study opportunities to promote visual telehealth.



**Figure 7.2** Summary of the non-adoption, abandonment, spread, scale-up and sustainability framework's findings

## 7.4 Implications from the findings and recommendations

The PACE-IT study aimed to improve the care provided to older people in RACFs and demonstrated how VTCs can augment telephone outreach services. The evidence produced by the PACE-IT project will contribute to future improved outcomes for RACF residents and healthcare efficiency in the following ways:

- Implementing the PACE-IT MOC in the HNE LHD can improve care outcomes for the 148 RACFs across its footprint. However, a longer support period is needed to embed the MOC into routine practice.

- The reported findings can be used to promote and support care for RACF residents at state, national and international levels, to facilitate key recommendations, develop targeted, measurable strategies and implement other evidence-based approaches.
- The findings provide important insight and information to stakeholders and policymakers in Australia and worldwide to improve the care of older people in RACFs.
- By introducing VTC and reducing needless hospital transfers, there is potential to relieve the burden of care for strained healthcare systems that struggle to manage the number of RACF residents transferred to EDs nationwide and globally.
- The PACE-IT MOC supports RACF nurses clinically to improve their assessments of residents and improve outcomes.
- There are opportunities for further research with improved ambulance service communication pathways to benefit older individuals.
- This study's findings add to the body of knowledge on care for older people in RACFs, and it is unique in that it is the only study implemented on this scale.
- The urgent need to recognise and promptly address the severe workforce shortage of nurses in the field of older person care.

## **7.5 Strengths and limitations**

The use of a stepped wedge cluster RCT design was a notable strength of the project. The most effective design to test the implementation of an intervention of this nature, as randomisation accounted for both known and unknown confounders. It allowed for cyclical changes that might have occurred over the two-year data collection period, enabling modification and reinforcement of implementation strategies throughout the process, including adaptations necessitated by the COVID-19 pandemic, such as transitioning to

online or offsite implementation of the PACE-IT education program. The step-by-step implementation within RACFs, two at a time, before expanding to other facilities, proved to be a practical approach, considering the challenges associated with managing simultaneous implementation in 16 RACFs, each with different workforce structures and IT resources. A limitation of the stepped wedge cluster RCT was the inability to reach statistical power due to generally low RACF ED presentations during the COVID-19 pandemic, which affected the overall RACF and ED populations. However, a strength of the project was its diversity in context, encompassing both rural and metropolitan areas in a large region of NSW.

A further strength of this study was the candidate's role as both PhD student and employment as the PACE-IT project coordinator. As an experienced ASET nurse previously employed in one of the EDs, the candidate had engaged with many referring RACFs when consulted about the transfer of residents. Existing trust-based relationships and valuable insights established during the ASET nurse role were beneficial for engaging RACFs and EDs in one LHD, although implementing the project in a different LHD initially posed challenges in generating new relationships. Collaborating closely with the general manager of the second LHD proved essential in overcoming barriers that could have hindered project progression, emphasising the importance of high-level stakeholder engagement. The absence of an ACE service in the second LHD added further complexity, as the research team had to implement not only the PACE-IT project but also the ACE service, as they had no outreach service in place. In this case, the experience as an ASET nurse was extremely valuable in guiding the setup of the service in the new LHD. Local knowledge of both LHDs significantly shaped the utility and practicality of alternative pathways for RACF residents.

The initial study protocol included plans to explore the perspectives of residents in this research. However, a significant proportion of participants did not have the capacity to

provide valid informed consent for interviews. This would be a worthwhile approach in future research of this area.

Another limitation of the study was the arrival of the COVID-19 pandemic requiring RACFs to be in lockdown during the time frame for focus groups to be conducted. Modifications needed to be made to the focus group delivery format based on the participants' locations and COVID-19 restrictions. Face-to-face sessions were held with nurses from RACFs, while video conferencing was used for ED nurses. The different modalities affected the dynamics and flow of conversations, with online distractions and interruptions in the ED focus group. However, the video conferencing allowed for input from all participants without dominant individuals taking control, which occasionally occurred in the RACF focus groups.

The COVID-19 preparedness study's strength was that it was undertaken in real time during the COVID-19 pandemic. A further strength lies in the generosity of RACF managers in sharing their experiences and solutions during the peak of the first wave of COVID-19. However, a limitation is the context-specific nature of the individual RACF challenges and the varying severity of the pandemic across facilities that may restrict the transferability of findings to other areas of Australia or internationally.

Including a cost consequences analysis, which is beyond the scope of this thesis, will potentially strengthen the evidence for implementing VTC in the RACF and ED contexts more widely and increase long-term sustainability.

Other limitations have been thoroughly examined by employing the reflective lens of the NASSS framework to analyse PACE-IT implementation. The candidate acknowledges the inherent potential for improvement in the implementation of the PACE-IT project, particularly being the candidate's inaugural project. Using the NASSS framework has shed

light on areas that could benefit from enhancement and refinement, fortifying the next steps and strategies for PACE-IT.



## 7.6 Conclusion

In conclusion, the PACE-IT study successfully achieved its first aim by confirming that the augmentation of Aged Care Emergency (ACE) services, incorporating protocol-guided interactive Video Teleconferencing (VTC) for clinical decision-making, along with telephone follow-up, effectively reduced Residential Aged Care Facility (RACF) resident transfers to the Emergency Department (ED) compared to usual care.

However, important insights concerning the second aim were presented in the study findings. While the model demonstrated acceptability among RACF and ACE/ASET nurses, the findings indicated that its sustainability faced challenges. The application of the Non-Adoption, Abandonment, Spread, Scale-Up, and Sustainability (NASSS) framework identified barriers that hindered the long-term viability of the model. These insights underscore the importance of addressing the identified barriers and leveraging enablers to enhance the overall implementation and sustainability of the augmented ACE services.

The main challenge was the withdrawal of the project coordinator after the project ceased when funding expired for the role. Other key factors that impaired sustainability were the need for a project driver, the lack of workforce consistency, continual staff shortages, the nursing skill mix, availability and access to equipment, inadequate Wi-Fi and the additional time required for VTC, indicating the need to streamline the process. There is a need to future-proof and further embed the underpinning of the ACE service to ensure the PACE-IT intervention can be improved, embedded, sustained and scaled. This requires ongoing high-level sponsorship and engagement with executive leaders and other relevant stakeholders in RACFs and EDs alongside GPs and the NSW ambulance service. The sustainability findings in this Chapter must be addressed to achieve these goals.

This research began through the desire to improve the healthcare journey to the ED from a RACF for one of many RACF residents, Nancy Smith. The concern for Nancy started

with a conversation she had with in the ambulance bay in one of the busiest EDs in Australia, John Hunter Hospital. Nancy revealed that she was scared to come to the ED and to be admitted to the hospital as she felt vulnerable and unable to speak up for herself. As she was often in hypoactive delirium when she presented to ED, Nancy could not advocate for her health needs and relied on those around her for decision-making. The motivation is that the findings from this research will help motivate further improvements in older people's health care and that healthcare professionals continue to implement practices like VTC that include older people in their healthcare choices.

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## Appendices

### Appendix A: PACE-IT staff survey (supplementary file 5)

#### PACE-IT Survey

Page 1

##### PACE-IT Research Project Staff Survey

You are invited to take part in a survey related to the Visual Telehealth Aged Care Emergency (ACE) call you had recently.

Participation in this survey is voluntary and all information provided is anonymous.

Your participation in this survey will assist our team to evaluate the Visual Telehealth ACE call process and inform improvement strategies.

The survey should take less than 5 minutes to complete.

#### PACE-IT Survey

Page 2

##### Section 1. Demographic information

Please select the response that applies to you

1. Gender\*
  - ☐ Male
  - ☐ Female
  - ☐ Prefer not to answer
2. Age\*
  - ☐ 30 years or less
  - ☐ 31-40 years
  - ☐ 41-50 years
  - ☐ 51-60 years
  - ☐ Over 60 years
3. What is your main role at the RACF?\*
- ☐ Registered Nurse
- ☐ Enrolled Nurse
- ☐ Assistant in Nursing
- ☐ Manager
- ☐ Administration staff
4. Do you speak a language other than English at home?\*
- ☐ No
- ☐ Yes
5. How well do you speak/write English?\*
- ☐ Very well
- ☐ Well
- ☐ Not well



## Section 2. About the Visual Telehealth ACE call

Please select or enter the response that applies to you

6. I have attended the following Visual Telehealth ACE call training programs:  
[comprising - 1) face to face education session at the RACF, 2) a visit to ED]\*
- ☐ Face to face education session  
☐ ED site visit  
☐ Both  
☐ Neither

**Your response indicates that you have had no Visual Telehealth ACE call training. If you would like training, please call Carla Sunner on 02 4024 6720. Or email [Carla.Sunner@health.nsw.gov.au](mailto:Carla.Sunner@health.nsw.gov.au).**

7. What was the length of your latest Visual Telehealth ACE call in minutes?\*

The response must be in whole minutes (eg 1 hr 15 mins should be entered as 75).

The value must be between 5 and 90, inclusive.

8. Overall, how many times have you participated in the Visual Telehealth ACE call to discuss a resident's clinical issue?\*

- ☐ First time  
☐ 2-4 times  
☐ 5-10 times  
☐ more than 10 times

9. Which RACF were you working in when you participated in your most recent Visual Telehealth ACE call?\*

# PACE-IT Survey

## Section 3. Technology, Quality, Accessibility and Adaptability

This is about your experiences using a Visual Telehealth ACE call.

Please respond to the following statements by rating your level of agreement with each.

### 10. Technology and Quality\*

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1. The Visual Telehealth ACE call was easy to set up	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. The Visual Telehealth ACE call was easy to use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. The quality of the Visual Telehealth ACE call was acceptable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

### 11. Accessibility and Adaptability\*

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1. The Visual Telehealth ACE call was too time consuming compared to a normal ACE phone call	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. I have received good support from our facility champion in the use of Visual Telehealth ACE calls	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. The training I received in the use of Visual Telehealth ACE calls has been adequate	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Your response indicates that you have had a problem with one or more of the Technology, Quality, Accessibility or Adaptability aspects while using Visual Telehealth ACE calls. If you would like advice or assistance, please call Carla Sunner on 02 4924 6720. Or email [Carla.Sunner@health.nsw.gov.au](mailto:Carla.Sunner@health.nsw.gov.au).**

## Section 4. Usefulness and Engagement

Please respond to the following statements by rating your level of agreement with each.

### 12. Usefulness

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1. The Visual Telehealth ACE call enhanced communication between myself, the resident/carers and the ED clinician	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. I believe the Visual Telehealth ACE call provided a more person-centred approach for the resident	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. I was satisfied with the agreed resident management/care plan generated from the Visual Telehealth ACE call	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

13. Your response indicates that you have had a problem with the Usefulness of Visual Telehealth ACE calls.  
We value your opinion and would like to help solve any problems you are experiencing.  
Please enter comments about your experiences using Visual Telehealth ACE calls so we can address these issues.

Please follow the ISBAR framework for your response:

Introduction  
Situation  
Background  
Assessment  
Recommendation

### 14. Engagement

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1. My overall Visual Telehealth ACE call experience was positive	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. I will use the Visual Telehealth ACE call process again	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. I will recommend the use of Visual Telehealth ACE calls to other people	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

### Comments

15. Please provide any comments or suggestions that can improve the use of the Visual Telehealth ACE call to manage the situation for residents.

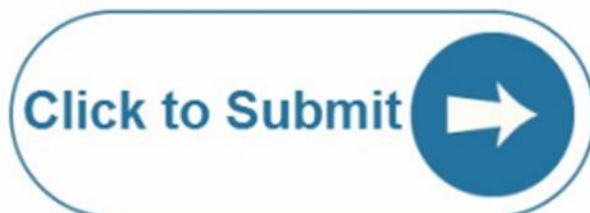
If you have an issue or a matter that you would like to discuss further with us, please contact the PACE-IT Research Team on 02 4924 6720.

Michelle Giles  
Manager, HNE Nursing and Midwifery Research Centre  
Email: [michelle.giles@health.nsw.gov.au](mailto:michelle.giles@health.nsw.gov.au)  
or  
Carla Sunner  
PACE-IT Project Manager  
Email: [Carla.sunner@health.nsw.gov.au](mailto:Carla.sunner@health.nsw.gov.au)

Thank you  
PACE-IT Research team

**Thank you for completing the survey.**

**Your answers will now be saved, by clicking Submit.**



## Appendix B: ISBAR structured clinical handover (supplementary file 6)



### ISBAR4AC/Nurse Clinical Handover Information For Residential Aged Care Facilities

Resident Name:

DOB: / /

Age:

NOTE: Complete ISBAR prior to contacting the GP/ACE Service/NSW Ambulance  
If TRANSFER to ED send: ISBAR4AC, Observations Chart, Medication Chart, Advance Care Plan / MOLST, Confusion Assessment Method (CAMI)  
**Please use yellow envelope if available**

<b>I</b> Identify	Your name and role:		RACF:	RAC ID:
	Direct phone number for call back:		RACF Direct Fax number:	
Name and position of person you are speaking to:				
<b>S</b> Situation	Resident's main problem / symptom at present?			
	How long has this been an issue?			
<b>B</b> Background	Is there any relevant medical history? <i>(have chart available)</i>			
	Medications <i>(have chart available)</i>		Known Allergies:	
	Initial treatment and the effect on the resident?			
	Has Resident's family been notified of current problem/symptom? Yes / No			
	Name of the resident's usual GP:			
<b>A</b> Assessment	Baseline Observations: <i>(have chart available)</i>		Current Observations:	
	Date:	Time:	Date:	Time:
	Temp:	Blood pressure:	Temp:	Blood pressure:
	Pulse rate	(regular/irregular)	Pulse rate:	(regular/irregular)
	Respirations:	Oxygen saturation:	Respirations:	Oxygen saturation:
BGL:	Weight:	BGL:	Weight:	
Urinalysis:	Urinalysis:			
<b>R</b> Recommendation	1. Are there any injuries or abnormal findings? See Symptom Reference Guide over page			
	2. Is resident more confused than usual? If yes, complete Confusion Assessment Method - see ACE Manual		Yes / No CAM score = 1 2 3 4 (circle)	
	3. Is the resident in pain? If yes, use FACES chart over page to determine amount of pain Circle the type of pain:		Yes / No Pain score = / 10 Chronic / Acute / Acute on Chronic	
	I am requesting assistance with / advice for: <i>Symptom management Medication review GP assessment of patient Sending patient to ED Other</i>			
	What are the goals of Care <i>(consider Advance Care Plans)</i> :			
Doctor's Orders / ACE Advice:		Outcome of ACE call - resident to be managed: (Please circle)		
Name:	Signature:	Date:	<ul style="list-style-type: none"> <li>In facility</li> <li>With assistance of third party</li> <li>By GP / Ambulance / Other</li> <li>Transferred to ED</li> </ul>	

ISBAR4AC FORM v13 130219



## Appendix C: PACE-IT newsletter



Connecting care to improve health outcomes  
for older people living in residential care

### Newsletter

Issue 3 September 2020

#### The PACE-IT Project Update

PACE-IT started implementation in March this year but then came COVID-19. This has delayed the project by three months. Now we are delighted to say that we were able to recommence in June/July and have now implemented in three emergency department (EDs) and six residential aged care facilities (RACFs).

During the three-month project suspension period we completed a sub-study, which involved interviewing RACF staff about their experiences and challenges related to COVID-19. This information has helped to inform our implementation strategies and how we can optimize the use of telehealth to provide better support to RACFs.

The aged care service in emergency teams (ASET) nurses that are using the PACE-IT model of care (MoC) have given some great feedback about how visual telehealth consultations have enhanced their ability to make informed decisions about care management and has assisted in avoiding unnecessary hospital transfers.

#### The Orange PACE-IT project update

Now that September is here, Wontama and Gosling Creek RACFs in Orange, are preparing for their implementation. RACF staff members have recently attended education on Aged Care Emergency (ACE) Education/ISBAR sessions through Hunter Primary Care, in preparation. A big thank you to Leigh Darcy (Special Projects Manager) from Hunter Primary Care for facilitating this.

'Train the Trainer' education sessions have been scheduled at these two sites and the telehealth app is in the process of being installed.

Calare and Cherrywood RACFs are also working towards implementation in November and are very keen for PACE-IT to proceed and be successful. The common goal of better outcomes for residents has kept all involved focused and working together.

#### WHO NEEDS TO KNOW ABOUT THIS PROJECT ?

All General Practitioners (GPs) linked to the participating RACFs will be sent an information letter outlining the project and MoC prior to implementation so that they are aware and can participate as required. In addition, a summary letter outlining the telehealth consultation and the management plan will be automatically generated and sent to the GP and the RACFs.

For further in-depth information, feel free to access the links to:

- The latest PACE-IT publication - <https://rdcu.be/b5J40>
- A two minute film about PACE-IT - [YouTube](#)
- <http://www.hnehealth.nsw.gov.au/telehealth/Pages/PACE-IT.aspx>



Education session with the Naria Village staff

#### What is pace-it?

partnerships in  
aged  
care  
emergency services using  
interactive  
telehealth

Complete 5 Visual Telehealth and Staff  
Survey and win a **REWARD**. Please  
read the **flyer** for more information.

#### RACF staff response

*Benefits of Vision*  
Better communication  
Family involvement  
Less fear + anxiety for residents  
Shared decision making  
Person centred decision making - *from staff*  
Timely care → safety supported  
↑ teamwork, staff support  
Building relationships + partnerships  
between ED + RACF staff  
Better access to expert support  
Care in the right place - comfort  
Cost effectiveness  
Better resident outcomes +  
Saving time

Project Contacts: Carla Sumner (0477 329 996) and Michelle Giles (0457 710 429)

## Appendix D: PACE-IT brochure



Connecting care to improve  
health outcomes for older  
people living in residential care



### What is pace-it?

partnerships in  
aged  
care

emergency services using  
interactive  
telehealth



For more information contact

Carla Sunner on 0477 329 996 or visit

[www.health.nsw.gov.au/Pages/default.aspx](http://www.health.nsw.gov.au/Pages/default.aspx)



A modern and essential move  
toward the future

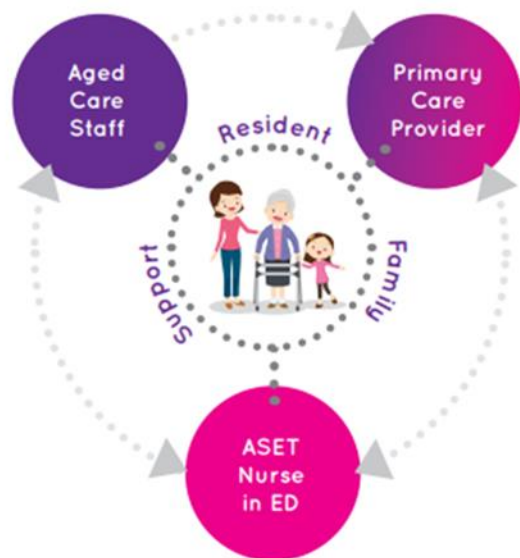


## Introduction

Sometimes older people from Residential **Aged Care Facilities (RACFs)** are transferred to **Emergency Departments (ED)** due to illness or injury. These transfers can be risky and cause stress, anxiety and trauma, since EDs are busy places and continue to get busier. In reality, many health related issues can be managed outside of the busy ED and some transfers can be avoided. Now, with the use of Visual Telehealth technology we have the ability to do just this. Our goal is to ensure that older Australian's living in RACFs receive the best possible care in the right place, for the right reason, at the right time. This system has the potential to improve the clinical care and quality of life of the frail older person.

## How does it work?

The Visual Telehealth system can be connected to the **Aged Care Emergency (ACE)** service at the local hospital with **Agedcare Service in Emergency Team (ASET)** nurse in ED. This provides an opportunity for the skilled ED staff to see and speak with the RACF resident, family and staff to provide immediate and valuable support to an acutely unwell individual or provide timely advice in a non-acute situation. With visual technology we can enhance connectivity with the resident, families, ED staff, and GP, ensuring the highest quality of care.



## Who is involved and what role do you play?

- **General Practitioner and primary care providers** – will receive improved communication from the Visual Telehealth ACE call including summary of the resident's management plan.
- **Resident and family** – can be involved in the Visual Telehealth consultation from any location, which will provide improved decision making for the families and the resident.
- **RACF staff** – can have access to expert clinical advice and support from the ACE emergency nurse in ED.
- **ASET Nurse in ED** – can apply advanced practice skills to provide urgent advice and further support the GP, whilst improving outcomes for the older person.

## Appendix E: PACE-IT educational session plan

### Education Aims

- Develop the knowledge, skills and confidence with the PACE-IT intervention
- Develop a shared understanding of the PACE-IT process, goals and outcomes

### Specific Objectives

RACF staff will

- Develop a working knowledge of the PACE-IT process
- Be aware of the role of all stakeholders
- Confidently use the Visual Telehealth consultation (VTC) technology
- Collaborate and communicate effectively using ISBAR via VTC
- Make decisions confidently with the resident
- Feel supported with the PACE-IT model of care
- Problem solve when issues arise


Time	Activity	Purpose	Instruction	Resource
AIM	Introducing the project and each other			



13:00	Introduction power point (PPT) presentation to guide session	Courtesy get to know the participants	Go round the room and say your name and role  Go through aims and objectives above	Distribute a <a href="#">PACE-IT information pack</a> with paperwork and resources for staff to refer to today and beyond, Remind the nurses that resources are available in the <a href="#">PACE-It Resource folder</a> , as well as in the <a href="#">PACE-IT information pack</a> and on the <a href="#">PACE-IT USB flash drive</a>
13:10	Exercise 1  Icebreaker  Stimulus  PictureCards	Establish how participants are feeling prior to commencing to help people relax	Ask the question “How did you feel when you had to send a resident to the emergency department?” pick a card that reflects that feeling. Cards are placed on the table for staff to pick  Ask the nurses to rate their own confidence with utilising a VTC, 1-10 scale of confidence - hands up  1 low 10 high	Picture cards
13:20	Exercise 2  Broadly; What do you want for your residents?	To understand whether the VTC can meet these aims	Ak for the phrase that best describes what they want to achieve for the resident, themselves, and their workplace. This will be used to refer to at the end of the session.	White board or adhesive A5 paper  Adhesive “Post it” notes, markers, pens

	In your workplace What do you want for yourself?			
	A picture of words that have described using ACE in the past “Elephant in the room”	Others feel this way	Results from focus group, the difficulties with the use of ISBAR and lack of it at times, frustrations and the time it takes	Refer to PPT
13:30	Exercise 3  Wool exercise “spinning a yarn”	Demonstrates the web of communication/ miscommunication and complexity of services that may be difficult to navigate	5 staff members and a timekeeper  Have staff participate as Mr Brown the resident, Nurse Betty the RACF staff member, Nurse Alice the ACE nurse, Margaret family member, Dr Bob the GP, tangled web of calls, duplication, time it takes. Participants are talked through a scenario.  Note that no documentation has occurred in this scenario	Container with balls of wool-  Scenario 1

			PROMPT- Use a story line about an unwell resident in an RACF and take note of the time it takes and the amount of phone calls that are needed to get the information or plan appropriate care	
13:45	PACE-IT film 1 “Glad you didn’t have to go to hospital”	Information and background about the VTC and why we need it.	Play video and discuss issues in the film <a href="https://www.youtube.com/watch?v=94C_C7lw4ho">https://www.youtube.com/watch?v=94C_C7lw4ho</a> Questions? Generated dialogue There may be more words to go on the whiteboard paper Discuss	Video capability resource with Wi-Fi  Remind the nurses that this film is available in the <b>PACE-IT information pack</b> on a <b>PACE-IT USB flash drive</b>
1400 Break for 10 mins				
Aim – The actual telehealth process				
Time	Activity	Purpose	Instruction	Resources
14:10	<u>RACF Only</u> Scenario 1 part A ACE phone call about Mrs Nancy	Familiarise staff with use of the structured Communication tool	Nurses to have the actual paper-based ISBAR in front of them, go through ISBAR and work through the scenario  Role Reversal Scenario: the ACE nurses will be the RACF staff (select 2 volunteers).	Telephones  ISBAR- Remind the nurses that resources are available in the PACE-It Resource folder,

	Smith who has a leg ulcer	for clear concise information exchange.	<p>Scenarios and ISBARs recorded on a white board or adhesive A5 paper – group work.</p> <p>Nancy has a leg ulcer that is difficult to describe over the phone. What do you need to know to make a decision about Nancy's management plan</p>	<p>PACE-IT information pack and on the PACE-IT USB flash drive</p> <p>Volunteer 1 to be – Nurse Betty, Volunteer 2 - Nancy</p> <p>Educator and RACF nurses will be nurse Alice</p>
14:20	Introducing My Virtual Care (MVC)	Use of platform	<p>Mock calls to ED or to each other in the session in different rooms</p> <p>Explain virtual waiting room – saves time waiting around and process of connection. The need to have Google Chrome web browser.</p> 	<p>On the screen connect to the MVC Video conferencing</p> <p>Ask group what they think afterwards and document their thoughts</p> <p>Remind the nurses that resources are available in the <a href="#">PACE-It Resource folder</a>, <a href="#">PACE-IT information pack</a> and on the <a href="#">PACE-IT USB flash drive</a></p>
	<u>RACF only</u> ISBAR with Scenario 2	Act out a real issue provided by the staff	What needs to happen and why? What further information do you need and from whom? Who needs to be involved? Does the family and how willing are they to be?	As a whole group or two groups - ISBAR Tool

			<p>Part 1- Work the scenario into one with an ISBAR and one without ISBAR tool/framework</p> <p>Part 2 – compare with ACE ISBAR tool/framework and fill in the gaps.</p>	<p>Scenarios and ISBARs (found in the <a href="#">PACE-IT information pack</a>) recorded on a white board or A5 adhesive paper – group work</p>
14:30	<p><u>RACF only</u></p> <p>Scenario 1 part B with MVC</p>	<p>Highlight the difference of using added vision with assessment capability</p>	<p>Simple ISBAR</p> <p>Clarity about what needs to happen</p>	<p>2 telehealth enabled devices eg iPad or laptops</p> <p>Remind the nurses that resources are available in the <a href="#">PACE-It Resource folder</a>, <a href="#">PACE-IT information pack</a> and on the <a href="#">PACE-IT USB flash drive</a></p>
14:50	<p>What benefits does telehealth add?</p>	<p>Telephone versus telehealth</p> <p>Vision gives better assessment to plan management</p>	<p>Encourage the group to identify advantages of using VTC</p> <p>How can MVC bridge the problems of communication - Refer to the words from Exercise 2</p> <p>Prompts –person-centred, collaboration, family, rich assessment, strengthening partnerships, timely care in right place, less disruption, hospital avoidance, less adverse events, supported staff.</p>	<p>A5 adhesive paper or white board</p> <p>Words from Exercise 2</p>

15:00	PACE-IT film 2 “Best case scenario”	Instruction components of the film	Discuss the process and get feedback  Did it pull it together for them?	Video capability resource with Wi-Fi  Remind the nurses that this film is available in the PACE-IT information pack on a USB flash drive
15:10 break for 10 mins				
15:20	What other ways can you utilise telehealth?	Versatility of the technology how it will assist the resident	<ul style="list-style-type: none"> <li>• Outpatients’ department appointments</li> <li>• Family involvement</li> <li>• Potential GP involvement</li> <li>• Delirium screening</li> <li>• Power of visual</li> </ul>	Go through brochure and refer to the poster all available in the <a href="#">PACE-It Resource folder</a> , <a href="#">PACE-IT information pack</a> and on <a href="#">the PACE-IT USB flash drive</a>
15:25	Further information	Important information for research data collection	<p>Survey * (RACF only) and the information statement how to do the survey and how it will get to you.</p> <p>The new automated notification letter to GP and RACF documenting the ACE/VTC</p> <p>Follow up phone call procedure for (ED staff only)</p> <p>The role of the Champion as resource and train others to snowball the education to others.</p>	<p>Discussion and template</p> <p>Champion cards</p> <p>Champion role found in the <a href="#">PACE-It Resource folder</a>, <a href="#">PACE-IT information pack</a> and on <a href="#">the PACE-IT USB flash drive</a></p>

15:45	Time for reflection on the words from - What do you want for the resident?	Staff to understand how much this can help them reach their goals for the resident	Discuss the words derived from Exercise 2 - What do you want for your residents? The staff will now understand how the use of vision can help with resident choice in their own health care, safety, workplace satisfaction, and upskilling.  Wrap up	Refer back to the white board or A5 adhesive paper
15:50	How is everyone feeling about this now?	Maybe do cards again.  Feedback	<b>Evaluation</b>  1-10 scale of confidence hands up- 1 low 10 high  QUESTIONS?	Evaluation sheet found in the <a href="#">PACE-IT information pack</a>
16:00	Finish		<b>Evaluation</b>	

## Appendix F: PACE-IT educational resources

Educational Resource	PACE-IT Resource folder		PACE-IT Information packs		PACE-IT USB flash drive (plug and play digital storage device)	
	ED	RACF	ED	RACF	ED	RACF
ACE/Brochure	P	P	P	P		
ACE manual (electronic link <a href="http://acehealthpathways.org.au">http://acehealthpathways.org.au</a> ,username: aged; password: care)					P	P
Attendance sheet	P	P				
ACE/ PACE-IT Flowchart (see Appendix 5)	P	P	P	P	P	P
Champion role guide for ED	P		P		P	
Champion role guide for RACF		P		P		P
Champion card	P	P	P	P	P	P
Education day Power-point for RACF nurses		P		P	P	P
Education day Power-point for ED nurses	P		P		P	P
Evaluation sheet	P	P	P	P	P	P
iPMS how to log an ACE/VTC call	P		P		P	
Implementation schedule	P	P	P	P	P	P
ISBAR 4AC (see Appendix 4)	P	P	P	P	P	P
*PACE-IT brochure	P	P	P	P	P	P
*PACE-IT film 1 “Glad you didn’t have to go to hospital” <a href="https://www.youtube.com/watch?v=94C_C7lw4ho">https://www.youtube.com/watch?v=94C_C7lw4ho</a>					P	P
PACE-IT film 2 “Best case scenario” <a href="https://www.youtube.com/watch?v=TDmh0GBXCxA">https://www.youtube.com/watch?v=TDmh0GBXCxA</a>					P	P



PACE-IT Important links including; electronic survey, films, IT support,	P	P	P	P	P	P
*PACE-IT poster	P	P	P	P	P	P
PACE-IT Research Project Staff Survey (see Appendix 7)		P		P	P	P
PACE-IT information statement (consent acknowledged within the electronic survey)		P		P	P	P
*PACE-IT Tool Kit	P	P	P	P	P	P
Tele-connect iPad/computer/iPhone instruction guide	P	P	P	P	P	P

\*Access via website [https://www.hnehealth.nsw.gov.au/our\\_services/telehealth/pace-it](https://www.hnehealth.nsw.gov.au/our_services/telehealth/pace-it)

## Appendix G: Ethics approval notification

**From:** [no\\_reply@nrgis.health.nsw.gov.au](mailto:no_reply@nrgis.health.nsw.gov.au)  
**To:** [Michelle Giles \(Hunter New England LHD\)](#)  
**Cc:** [Carla Sumner \(Hunter New England LHD\)](#)  
**Subject:** 2019/ETH12853: Application HREA - Approved  
**Date:** Thursday, 7 November 2019 11:06:25 AM

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Date of Decision Notification: 07 Nov 2019

Dear Dr Giles

Thank you for submitting the following Human Research Ethics Application (HREA) for HREC review;

2019/ETH12853: Partnerships in Aged-Care Emergency services using Interactive Telehealth (PACE-IT).

This project was considered by the Hunter New England Human Research Ethics Committee at its meeting held on 6/11/2019 and was determined to meet the requirements of the National Statement on Ethical Conduct in Human Research (2007).

This project has been Approved to be conducted at the following sites:

- Belmont Hospital
- John Hunter Hospital
- Tamworth Hospital
- Orange Health Service

PLEASE NOTE: The following Residential Aged Care Facilities have agreed to participate:

- Bupa Aged Care, Tamworth
- Calare Aged Care, Orange
- Gosling Creek Aged Care, Orange
- Nazareth House RACF, Tamworth
- Opal Cherrywood Grove, Orange
- Opal Hillside RACF, Mount Hutton
- Opal Macquarie Place RACF, Cameron Park
- SummitCare RACF, Wallsend
- Uniting Alblas Lodge, Tamworth
- Uniting Lindsay Gardens, Hamilton
- Uniting Narla Village RACF, Belmont North
- Uniting McKay House, Tamworth
- Uniting Wantama, Orange
- Wallsend RACF, Wallsend
- Whiddon, Belmont
- Whiddon, Redhead

The following documentation was reviewed and is included in this approval:

- HREA (Version 5 created 5 November 2019)
- Response to HNEHREC requirements (dated 5 November 2019)

## Appendix H: Information statement for ASET staff focus group

# PACE-IT Information Statement for ASET Staff Focus Group

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### **PACE-IT Research Project Information Statement: Aged Care Services Emergency Team (ASET) Staff Focus Group**

#### **Partnerships in Aged Care Emergency services using Interactive Telehealth (PACE-IT)**

#### **Invitation**

You are invited to participate in the research project identified above which is being conducted by Dr Michelle Giles and Carla Sunner from the Nursing and Midwifery Research Centre at Hunter New England Local Health District in partnership with Western NSW Local Health District. The research is part of Carla Sunner's PhD study at the University of Newcastle, supervised by Dr Michelle Giles and Professor Maralyn Foureur, School of Nursing and Midwifery, Faculty of Health, the University of Newcastle, NSW.

This project has been funded by the Ministry of Health via a Translational Research Grant Scheme.

#### ***Why is the research being done?***

The purpose of the research is to assess whether the addition of the Visual Telehealth ACE call to the Aged Care Emergency (ACE)/Aged Care Service in Emergency Team (ASET) nurse in the Emergency Department (ED) can further assist in decision making that reduces the need for Residential Aged Care Facility (RACF) resident transfers to ED.

#### ***Who can participate in the research?***

You are eligible to participate in a focus group if you are employed as an ASET / ACE nurse and will be or have been completing Visual Telehealth ACE calls from an ED to an RACF.

#### ***What would you be asked to do?***

If you agree to participate in this study you will be asked to take part in a focus group with an independent researcher where you will be required to answer some questions related to potential or

actual barriers to successful visual telehealth ACE call assessment interactions you will be completing or have already attended. The focus group will be digitally recorded, documented and then transcribed. The information you provide will be combined with information from other participants to help identify potential barriers to successful implementation or what works well and what doesn't. This information will help improve the Visual Telehealth ACE assessment implementation and related processes in the future. Any identifying information or names will be removed prior to the information being analysed. You may review the transcript if you so request.

Participation in the study is voluntary and your refusal to participate will not affect your employment in any way. Should you choose to participate you can later decide to withdraw at any time before the focus group without giving a reason. If you do decide to withdraw from the study after the focus group has occurred the information you provided is still required as it forms part of the discussion.

***What choice do you have?***

Participation in this research is entirely your choice. Whether or not you decide to participate, your decision will not disadvantage you. If you do decide to participate, you may withdraw from the project at any time prior to participation.

***How much time will it take?***

The focus group will have approximately 10-12 participants. It will take approximately 30-60 minutes and will be held face-to-face or via a telehealth link on a prescheduled date and time.

***What are the risks and benefits of participating?***

There are no anticipated risks associated with participating in this research. Whilst there are no anticipated benefits to you personally in participating in this research, the findings will help us evaluate education and implementation strategies. By participating in this focus group, you will have the opportunity to provide feedback, share your views and help improve the Visual Telehealth ACE call process.

***How will your privacy be protected?***

You are assured that information which might identify you during the focus group will be coded to ensure anonymity. All information received from you will be strictly confidential. Code numbers will be used in place of names throughout the research process. Any information we gather will be stored in a separate locked filing cabinet accessible only to the researchers and research assistant. No identifying information will be placed on any of the study documents. Only coded information will be used in publications coming from this research. On completion of the data collection all coded data will be kept in a secure password protected directory for seven years, after which, all information and data will be destroyed.

***How will the information collected be used?***

The findings of the study will be used to improve ways in which the current Aged Care Emergency services provided through Visual Telehealth ACE assessment interactions will enable the provision of

safe and quality care to residents of RACFs. In addition, the study findings will point to areas of need for further education and service provision. This information will also be part of the thesis for Carla Sunner's PhD. In addition, the findings of this study will be presented in academic publications, journals or conferences. Non-identifiable data may also be shared with other parties to encourage scientific scrutiny and to contribute to further research and public knowledge, or as required by law. Individual participants will not be named or identified in any reports arising from the project although individual anonymous responses may be quoted.

### ***What do you need to do to participate?***

Please read this Information Statement and be sure you understand its contents **before** you participate in a focus group. If there is anything you do not understand, or you have questions, contact the researchers listed below.

Should participation in any of the research activities cause personal distress or discomfort, you will be referred to an appropriate support service (Employee Assistance Programme) within your organisation.

### ***Further information***

For further information about the project, please contact

Michelle Giles on (02) 4924 6702 [michelle.giles@health.nsw.gov.au](mailto:michelle.giles@health.nsw.gov.au) or

Carla Sunner on (02) 4924 6728 [carla.sunner@health.nsw.gov.au](mailto:carla.sunner@health.nsw.gov.au) .

Thank you for considering this invitation.

Dr Michelle Giles  
Chief Investigator

Carla Sunner  
Project Coordinator

### ***Complaints about this research***

This research project has been approved by the Hunter New England Research Ethics Committee of Hunter New England Local Health District, Reference No 2019/ETH12853.

Should you have any concerns regarding your rights as a participant in this research, or you have a complaint about the manner in which the research is conducted, it may be given to the researcher or, if an independent person is preferred to;

Dr Nicole Gerrand Manager,  
Research Ethics and Governance Hunter New England Local Health District Locked Bag 1, New Lambton NSW 2305  
Tel: (02) 4921 4950 or (02) 4921 4943 Email: [Nicole.Gerrand@health.nsw.gov.au](mailto:Nicole.Gerrand@health.nsw.gov.au)

## Appendix I: Information statement for RACF staff focus group

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### **PACE-IT Research Project Information Statement: RACF Staff Focus Group Partnerships in Aged Care Emergency services using Interactive Telehealth (PACE-IT)**

#### **Invitation**

You are invited to participate in the research project identified above which is being conducted by Dr Michelle Giles and Carla Sunner from the Nursing and Midwifery Research Centre at Hunter New England Local Health District in partnership with Western NSW Local Health District. The research is part of Carla Sunner's PhD study at the University of Newcastle, supervised by Dr Michelle Giles and Professor Maralyn Foureur, School of Nursing and Midwifery, Faculty of Health, the University of Newcastle, NSW.

This project has been funded by the Ministry of Health via a Translational Research Grant Scheme.

#### ***Why is the research being done?***

The purpose of the research is to assess whether the addition of the Visual Telehealth ACE call to the Aged Care Emergency (ACE)/Aged Care Service in Emergency Team (ASET) nurse in the Emergency Department (ED) can further assist in decision making that reduces the need for Residential Aged Care Facility (RACF) resident transfers to ED.

#### ***Who can participate in the research?***

You are eligible to participate in a focus group if you have attempted or completed a Visual Telehealth ACE call to an ED from your facility. *Please note that you are ineligible to participate if you have not attempted or completed a Visual Telehealth ACE call.*

#### ***What would you be asked to do?***

If you agree to participate in this study you will be asked to take part in a focus group with an independent researcher where you will be required to answer some questions related to the visual telehealth ACE call assessment interactions you have attended. The focus group will be digitally recorded, documented and then transcribed. The information you provide will be combined with information from other participants to help identify what works well and what doesn't, this will help improve the Visual Telehealth ACE assessment process in the future. Any identifying information or names will be removed prior to the information being analysed. You may review the transcript if you so request.

Participation in the study is voluntary and your refusal to participate will not affect your employment in any way. Should you choose to participate you can later decide to withdraw at any time before the focus group without giving a reason. If you do decide to withdraw from the study after the focus group has occurred the information you provided is still required as it forms part of the discussion.

***What choice do you have?***

Participation in this research is entirely your choice. Whether or not you decide to participate, your decision will not disadvantage you. If you do decide to participate, you may withdraw from the project at any time prior to participation.

***How much time will it take?***

The focus group will have approximately 4-6 participants. It will take approximately 30-60 minutes and will be held face-to-face or via a telehealth link on a prescheduled date and time.

***What are the risks and benefits of participating?***

There are no anticipated risks associated with participating in this research. Whilst there are no anticipated benefits to you personally in participating in this research, the findings will help us evaluate education and implementation strategies. By participating in this focus group, you will have the opportunity to provide feedback, share your views and help improve the Visual Telehealth ACE call process.

***How will your privacy be protected?***

You are assured that information which might identify you during the focus group will be coded to ensure anonymity. All information received from you will be strictly confidential. Code numbers will be used in place of names throughout the research process. Any information we gather will be stored in a separate locked filing cabinet accessible only to the researchers and research assistant. No identifying information will be placed on any of the study documents. Only coded information will be used in publications coming from this research. On completion of the data collection all coded data will be kept in a secure password protected directory for seven years, after which, all information and data will be destroyed.

***How will the information collected be used?***

The findings of the study will be used to improve ways in which the current Aged Care Emergency services provided through Visual Telehealth ACE assessment interactions will enable the provision of safe and quality care to residents of RACFs. In addition, the study findings will point to areas of need for further education and service provision. This information will also be part of the thesis for Carla Sunner's PhD. In addition, the findings of this study will be presented in academic publications, journals or conferences. Non-identifiable data may also be shared with other parties to encourage scientific scrutiny and to contribute to further research and public knowledge, or as required by law. Individual participants will not be named or identified in any reports arising from the project although individual anonymous responses may be quoted.

### ***What do you need to do to participate?***

Please read this Information Statement and be sure you understand its contents **before** you complete the survey. If there is anything you do not understand, or you have questions, contact the researchers listed below.

Should participation in any of the research activities cause personal distress or discomfort, you will be referred to an appropriate support service (Employee Assistance Programme) within your organisation.

### ***Further information***

For further information about the project, please contact

Michelle Giles on (02) 4924 6702 [michelle.giles@health.nsw.gov.au](mailto:michelle.giles@health.nsw.gov.au)

or Carla Sunner on (02) 4924 6728 [carla.sunner@health.nsw.gov.au](mailto:carla.sunner@health.nsw.gov.au) .

Thank you for considering this invitation.

Dr Michelle Giles  
Chief Investigator

Carla Sunner  
Project Coordinator

### ***Complaints about this research***

This research project has been approved by the Hunter New England Research Ethics Committee of Hunter New England Local Health District, Reference No 2019/ETH12853.

Should you have any concerns regarding your rights as a participant in this research, or you have a complaint about the manner in which the research is conducted, it may be given to the researcher or, if an independent person is preferred to;

Dr Nicole Gerrand Manager,  
Research Ethics and Governance Hunter New England Local Health District, Locked Bag 1, New Lambton NSW 2305, Tel: (02) 4921 4950 or (02) 4921 4943 Email:  
[Nicole.Gerrand@health.nsw.gov.au](mailto:Nicole.Gerrand@health.nsw.gov.au)



## Appendix J: Information statement for RACF manager interviews

# PACE-IT Information Statement for RACF Staff Interview

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### **PACE-IT Research Project Information Statement: RACF Manager interview Partnerships in Aged Care Emergency services using Interactive Telehealth (PACE-IT)**

#### **Invitation**

You are invited to participate in the research project identified above which is being conducted by Dr Michelle Giles and Carla Sunner from the Nursing and Midwifery Research Centre at Hunter New England Local Health District in partnership with Western NSW Local Health District. The research is part of Carla Sunner's PhD study at the University of Newcastle, supervised by Dr Michelle Giles and Professor Maralyn Foureur, (School of Nursing and Midwifery, Faculty of Health, the University of Newcastle, NSW) and Professor Ashley Kable (University of Newcastle, NSW).

This project has been funded by the Ministry of Health via a Translational Research Grant Scheme.

#### ***Why is the research being done?***

The purpose of the research is to assess whether the PACE-IT model of care (MoC) which includes the addition of the Visual Telehealth ACE call to the Aged Care Emergency (ACE)/Aged Care Service in Emergency Team (ASET) nurse in the Emergency Department (ED) can further assist in decision making that reduces the need for Residential Aged Care Facility (RACF) resident transfers to ED. Given the current COVID-19 pandemic, this research is also exploring how the PACE-IT MoC can potentially be optimised to assist and further support RACFs through this difficult time.

#### ***Who can participate in the research?***

You are being asked to participate in this interview because you are a manager of an RACF currently participating in the Aged Care Emergency (ACE) model of care (MoC) in HNELHD.

#### ***What would you be asked to do?***

If you agree to participate in this study you will be asked to take part in a 30 minute interview with an independent researcher where you will be required to answer some questions related to your experiences in dealing with the current COVID-19 pandemic and how the PACE-IT project could potentially provide support to your facility during this time. The interview will be digitally recorded and then transcribed. The information you provide will be combined with information from other participants to help identify what works well and what doesn't, this will help improve the PACE-IT MoC process in the future. Any identifying information or names will be removed prior to the information being analysed. You may review the transcript if you so request.

***What choice do you have?***

Participation in this research is entirely your choice. Whether or not you decide to participate, your decision will not disadvantage you. If you do decide to participate, you may withdraw from the project at any time prior to participation.

***How much time will it take?***

The interview will take approximately 30 minutes and will be held either by phone or via a video conference link on a prescheduled date and time.

***What are the risks and benefits of participating?***

There are no anticipated risks associated with participating in this research. Whilst there are no anticipated benefits to you personally in participating in this research, the findings will help us evaluate education and implementation strategies. By participating in an interview, you will have the opportunity to provide feedback, share your views and help improve the PACE-IT MoC.

***How will your privacy be protected?***

You are assured that information which might identify you during the focus group will be coded to ensure anonymity. All information received from you will be strictly confidential. Code numbers will be used in place of names throughout the research process. Any information we gather will be stored in a separate locked filing cabinet accessible only to the researchers and research assistant. No identifying information will be placed on any of the study documents. Only coded information will be used in publications coming from this research. On completion of the data collection all coded data will be kept in a secure password protected directory for seven years, after which, all information and data will be destroyed.

***How will the information collected be used?***

The findings of the study will be used to improve ways in which the current Aged Care Emergency services provided through PACE-IT MoC, including Visual Telehealth ACE assessment interactions, will enable the provision of safe and quality care to residents of RACFs. In addition, the study findings will point to areas of need for further education and service provision. This information will also be part of the thesis for Carla Sunner's PhD. In addition, the findings of this study will be presented in academic publications, journals or conferences. Non-identifiable data may also be shared with other parties to encourage scientific scrutiny and to contribute to further research and public knowledge, or as required

by law. Individual participants will not be named or identified in any reports arising from the project although individual anonymous responses may be quoted.

***What do you need to do to participate?***

Please read this Information Statement and be sure you understand its contents **before** you participate in an interview. If there is anything you do not understand, or you have questions, contact the researchers listed below.

If you are participating in the interview, please return the signed consent form to Ms Carla Sunner via email.

Should participation in any of the research activities cause personal distress or discomfort, you will be referred to an appropriate support service (Employee Assistance Programme) within your organisation.

***Further information***

For further information about the project, please contact

Michelle Giles on (02) 4924 6702 [michelle.giles@health.nsw.gov.au](mailto:michelle.giles@health.nsw.gov.au)

Carla Sunner on (02) 4924 6728 [carla.sunner@health.nsw.gov.au](mailto:carla.sunner@health.nsw.gov.au) .

Thank you for considering this invitation.

Dr Michelle Giles  
Chief Investigator

Carla Sunner  
Project Coordinator

***Complaints about this research***

This research has been approved by the Hunter New England Human Research Ethics Committee of Hunter New England Local Health District, Reference 2019/ETH12853

Should you have concerns about your rights as a participant in this research, or you have a complaint about the manner in which the research is conducted, it may be given to the researcher, or, if an independent person is preferred, to;

Dr Nicole Gerrand, Manager Research Ethics and Governance, Hunter New England Local Health District, Level 3 POD HMRI Lot 1 Kookaburra Circuit New Lambton NSW 2305, telephone (02) 49214950, email [HNELHED-HREC@health.nsw.gov.au](mailto:HNELHED-HREC@health.nsw.gov.au)

## Appendix K: The essential elements of ACE and VTC (supplementary file 1)

### Supplementary File 1

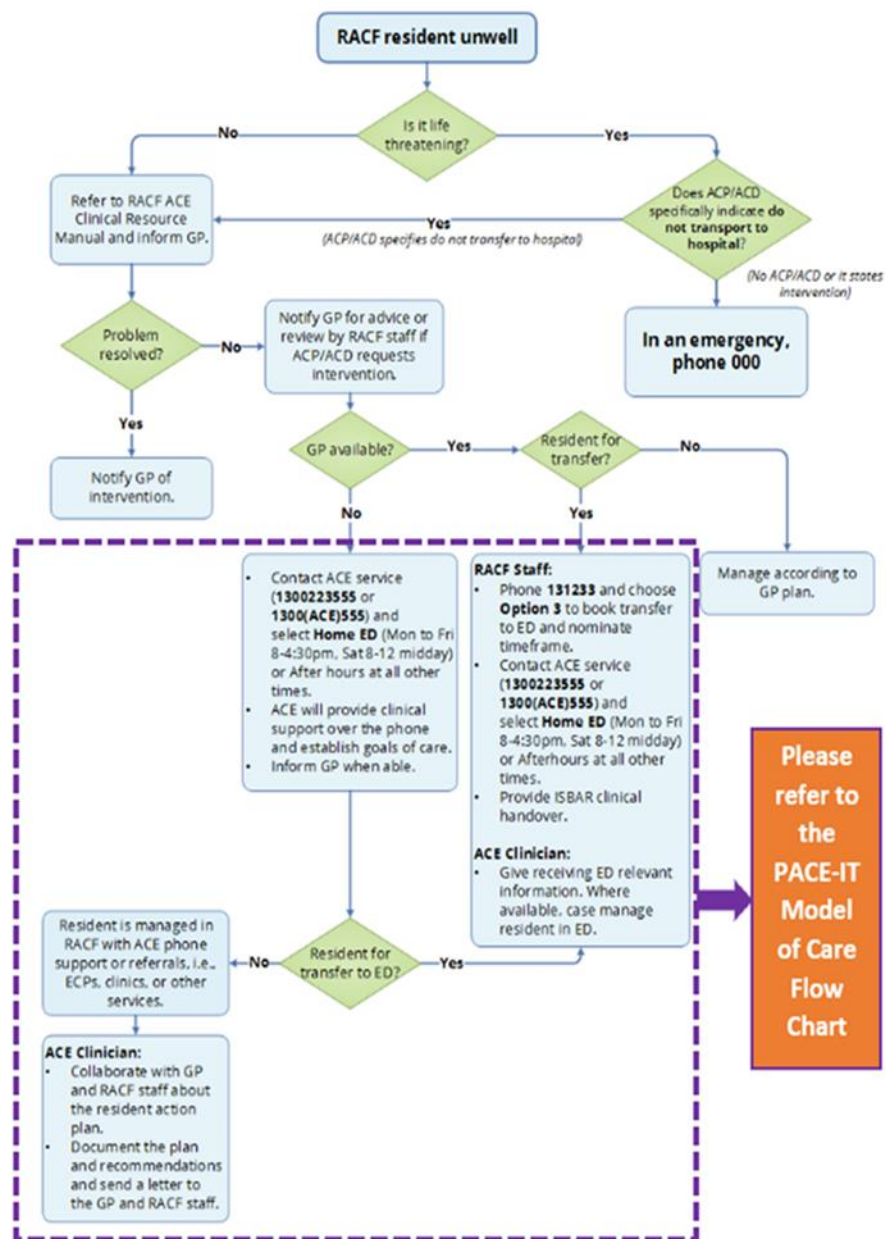
The Essential Elements of ACE (Hullick et al., 2021, p. 203) with the addition of VTC

Elements	ACE	VTC
A 24 hour nurse-led telephone consultation service for staff in RACFs provided by RNs in the ED Monday to Friday 8am-4pm and after hours by RNs from the local general practice organization.	P	P
Evidence-based algorithms for common acute symptoms and problems experienced by residents from RACFs, developed in consultation with multidisciplinary hospital and community-based providers along with RACF clinical leaders and the ambulance service.	P	P
If transfer is required, the telephone call also clarifies the reason for transfer to hospital through establishing the resident's goals of ED care.	P	P
Using the Identity, Situation, Background, Assessment, and Recommendation (ISBAR) protocol (Supplementary File 4).	P	P
Once in the ED, the resident receives proactive case management under the guidance of specialist aged care nurses.	P	P
Empowerment of RACF staff occurs through education in communication techniques including effective clinical handover, recognition of the deteriorating patient, and the evidence-based ACE algorithms.	P	P
The community of practice supports relationships and collaboration across RACFs, GPs, ambulance, local hospitals, and EDs with a shared understanding of the capability of each service.  Quarterly meetings are held to identify barriers and facilitators of care.  Regular governance and operational meetings with providers and managers.  Every RACF is assigned a home ED (based on geographical location).	P	P
Ongoing change management and coordination for the ACE program key stakeholders. (Hullick et al., 2021, p. 203)	P	P
Visual Telehealth Consultation (VTC) to enable interactive visual and auditory consultation between RACF staff, ED ACE nurses and the resident and, family (if available)		P
Visual Telehealth consultation PACE-IT educational session plan and resources (Please refer to Supplementary File 2 & 3) which aimed to develop the knowledge, skills and confidence with the PACE-IT intervention and to develop a shared understanding of the PACE-IT process, goals and outcomes.  Educational Objectives for ED and RACF nurses were to; Develop a working knowledge of the PACE-IT process; Be aware of the role of all stakeholders; Confidently use the Visual Telehealth consultation (VTC) technology; Collaborate and communicate effectively using ISBAR via VTC;		P


Make decisions confidently with the resident; Feel supported with the PACE-IT model of care; Problem solve when issues arise.		
Automated ACE consultation summary letter to the GP and the RACF with a description of the ACE or VTC call	P	P
24 hour follow up phone call post VTC		P



Abbreviations: ACE, Aged Care Emergency; ED, emergency department; GP, general practitioner; RACF, residential aged care facility; RN, registered nurse; VTC, visual telehealth consultation; PACE-IT, partnerships aged care emergency using Interactive Telehealth; ISBAR (Supplementary File 2).

## Appendix L: ACE/VTC flow chart (supplementary file 3)




## Appendix M: Implementation strategies (supplementary file 4)

Strategy		Rationale	Who	When
Engagement 	Establish implementation groups	Improve engagement, collaboration and understanding. Identify barriers and develop context specific implementation strategies	ED and RACF nurses	Established 3 months before implementation and met monthly before and during planning/intervention/ monthly implementation and 1 month after last implementation took place
	Stakeholder and Steering committee	Unlock barriers to the progress of the project. Take action to address threats to the project	LHD and MOH government executive level	3 monthly
	Information and technology	Develop user friendly systems for nurses to use, and data collection compliance.	Research team and participants	Fortnightly till reporting systems established
	Research team	Continue to connect and feedback to the team, provide case studies, and discuss barriers and discuss solutions to issues	Research team	Monthly meetings
	Newsletters	To continue to keep all participants and stakeholders engaged and informed of project proceedings. Continue to foster support for the project	Electronic /emailed  Mailed to General Practitioners	3 monthly

<p>Education and resources</p> 	Education sessions on VTC and ISBAR handover model (see Supplementary File 2)	Increase RACF staff awareness of intervention, strengthen the role of champions in progressing VTC in their workplace	RACF nurses	Initial implementation, ongoing with change of RACF staff
	Nurse training about video conferencing	Familiarise ED and RACF staff with video conference equipment used in intervention	RACF staff and ED nurses at each ED	Initial implementation
	ED nurses to attend RACF education days	Understand RACF context to enable implementation	ED nurses to attend RACF education days	Understand RACF context to enable implementation
	RACF Aged-Care Emergency Clinical Resource Manual	Familiarise ED and RACF staff with video conference equipment used in intervention ACE/PACE-IT flow chart model (see Supplementary File 3)	RACF nurses and ED nurses at each ED	Initial implementation, RACF champions were to continue to update the available resources and encourage new staff to familiarise themselves with it
<p>Resources</p> 	Project information brochures poster and videos	Guide ACE nurses in decision making for care of RACF residents	ED nurses	Project start and ongoing
	Manual for VTC and handover model including video conferencing	Guide ACE nurses and RACF staff to normalise the VTC and handover via video- conferencing	ED nurses and RACFs	Project start



	Establish video conferencing platform appropriate for use	Familiarise ED and RACF staff with video conference equipment used in intervention	ED nurses and RACFs Each site	Project start  Realtime feedback and at implementation meetings monthly and newsletters
Compliance audits and feedback 	PACE-IT Research Project Staff Survey (see Supplementary File 5) results	Address technology issues as soon as possible to ensure better integration	Nurses that participate in a VTC	Feedback via RACF champions and phone/email contact
	Implementation meetings	Improve operations and useability and acceptability of VTC. Round table discussion concerning issues, feedback and case studies via videoconferencing	Champions from all sites to attend	Monthly for the duration of the project
	Daily reports	Proactive support for participants by monitoring daily compliance and empower staff to continue with implementation strategies.	Research team to participants	Feedback via RACF champions and phone/email contact