

‘Focus on Frailty’: Co-Designing Digital Frailty Education with Healthcare Students

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Introduction: Frailty is prevalent in hospitals and is associated with adverse events and poor health outcomes. In Australia, there is a need for co-designed, multidisciplinary, and contextually relevant frailty education to improve healthcare students’ understanding and knowledge of frailty within the hospital setting.

Objective: This study aimed to i) explore healthcare students’ understanding of frailty and their experiences with patients who are frail, and ii) seek healthcare students’ design ideas for the content of a new digital frailty education course.

Methods: Participants were university students enrolled in a health-related degree. Online focus groups and interviews were conducted between August and September 2023. Participants were asked about their experiences with frailty education, older adults and people living with frailty; course content; education module topics; and the course name. Participants also completed a demographic questionnaire and a Research Engagement Feedback Survey. Descriptive statistics were used to analyze quantitative data. Qualitative data were analyzed using inductive template analysis, a type of codebook thematic analysis.

Results: Four themes were identified: 1) Perception of frailty as loss and decline; 2) Limited education on frailty; 3) Frailty education connected to the reality of practice; and 4) Learning and practicing person-centered care. Module topics prioritized by students were ‘identifying and assessing frailty’ and ‘understanding ageing, frailty, and geriatric conditions’. Participants advocated for a course name that was catchy and succinct, informing the course name: ‘Focus on Frailty’.

Discussion: Healthcare students expressed a desire to learn more about frailty and advocated for education that is skills-based, encourages practical application of knowledge, features storytelling and lived experiences, takes a holistic approach to frailty, and teaches person-centered care. Study findings will directly influence the design of education module topics and course content, and enhance Focus on Frailty’s relevance to the Australian healthcare context across medicine, nursing and allied health practice.

Keywords: co-design, eLearning, geriatrics, interprofessional, multidisciplinary, needs analysis

Introduction

Prevailing misconceptions about frailty, limited formal frailty education, and a lack of frailty-focused training can lead to suboptimal care and potentially inappropriate treatments for individuals living with frailty.^{1,2} Frailty is a multi-dimensional risk-state characterized by declines in physical, cognitive, emotional, and social capacity.^{3,4} It is estimated that 21% of older adults aged 65 years or older are living with frailty, with an additional 48% estimated to be pre-frail.⁵ While frailty is associated with older age, it can occur in young and middle-aged populations.⁶ People who are frail experience increased vulnerability to stressors and have a higher risk of experiencing poor outcomes and adverse events including falls, hospitalizations, post-operative complications, disability, poor quality of life, and mortality.⁷ They also

experience longer recovery times in hospitals following an acute injury, illness, or surgery, and may not fully recover back to their baseline health.⁸

Frailty is prevalent in hospitals, with 24–47% of patients estimated to be frail.^{9,10} Frailty-focused care, including the routine use of frailty assessments in practice, can be challenging in hospitals due to a complex interplay of stakeholder factors and contextual factors in hospitals.¹¹ Eamer et al (2017) identified a lack of frailty knowledge, high workloads, staffing shortages, and communication challenges between staff as barriers to formal frailty assessments.¹ Healthcare professionals often rely on clinical judgement including patient appearance, history, and ability, which may hinder the uptake of validated frailty assessment tools.^{12,13}

Not all healthcare professional accrediting bodies in Australia mandate frailty education in curriculums and healthcare professionals and students have self-reported a lack of formal education on frailty, ageing, and geriatric medicine.^{14–16} Arakawa Martins et al (2020) assessed the knowledge and competence of 65 Australian fifth-year medical students regarding working with people who are frail.¹⁴ They found that only 46% of students had previously been exposed to geriatric medicine, and more than half self-reported minimal competence in defining frailty, explaining frailty to a patient, assessing frailty, and managing frailty through nutritional advice or medication optimisation.¹⁴ Similar results were found for healthcare professionals in Australia.¹⁶ Internationally, there are challenges associated with embedding frailty education into curriculum, including a lack of consensus on the definition of frailty, challenges involving people living with frailty in education and teaching, and pervasive societal misconceptions about frailty.¹⁷ Despite these challenges, formal education has been found to improve students' knowledge, perceptions, and confidence in relation to the care of frail patients and older adults.^{14,15,18}

Student–staff partnerships in higher education have been shown to improve learning outcomes, student motivation, interaction, and inclusivity.^{19,20} Zarandi et al's (2022) systematic review found diverse benefits of student co-creation in higher education, including increased enthusiasm, enjoyment, and a deeper understanding of the subject material.²¹ Despite calls from researchers to improve geriatric education and make curriculum more engaging for students,²² limited research exists on the co-design of geriatric and frailty-focused education. Co-design refers to the meaningful and collaborative engagement of relevant stakeholders in the design processes of research and development,²³ to facilitate end-user engagement, adoption, and acceptability of outputs.

Current digital frailty education programs include the United Kingdom National Health Service Frailty E-learning Programme,²⁴ the Canadian Frailty Network's Frailty Education Module,²⁵ and the University of Technology Sydney's Facing up to Frailty course.²⁶ Some of these courses do not target hospital care, are aimed at a broad audience (eg, consumers, caregivers and healthcare professionals), and/or are not specific to the Australian acute care context. Co-designed, multidisciplinary and contextually relevant frailty education is needed for Australian healthcare professionals and students. This study forms part of a larger research project, "Development of online learning modules to increase knowledge and understanding of frailty", which aims to co-design, develop, and evaluate a digital frailty education course to improve health professionals' (medicine, nursing and allied health) and healthcare students' understanding and knowledge of frailty in hospitals (Figure 1). Key stakeholders, including consumers, caregivers, peak bodies, healthcare professionals and students, educators, and researchers have contributed to the course design. This study reports on findings from the needs analysis with students, which aimed to i) explore healthcare students' understanding of frailty, and their experiences with patients who are frail, and ii) seek healthcare students' design ideas for the content of a new digital frailty education course. The abstract of this paper was presented at the 'Australasian Society for Behavioural Health and Medicine Conference 2025' as a conference talk with interim findings.

Methods

Study Design

A co-design approach using focus groups and interviews was employed in this study to facilitate the collection of rich data about participants' experiences, ideas, preferences and perspectives on frailty education.²⁷ This research was guided by Beyond Sticky Notes' six co-design mindsets: 1) Elevating lived experience; 2) Practicing curiosity; 3) Offering

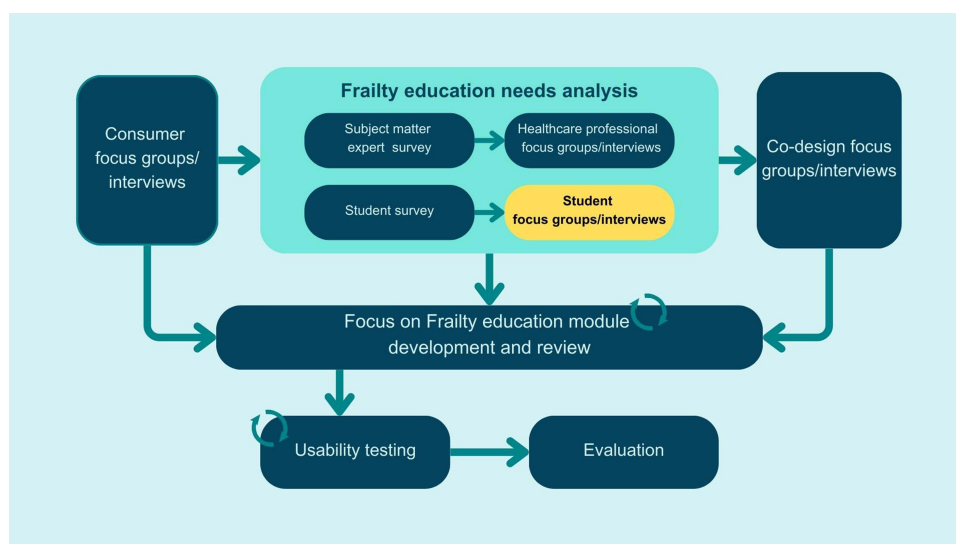


Figure 1 Methodology overview of the project “Development of online learning modules to increase knowledge and understanding of frailty”.

Notes: Regular arrows indicate the order of activities; circular arrows indicate iterative processes and feedback loops; the yellow highlighted section indicates the current study: healthcare student needs analysis focus groups and interviews.

generous hospitality; 4) Being in the grey (being okay with uncertainty); 5) Learning through doing; and 6) Valuing many perspectives.²⁸

Participants and Recruitment

Participants were students enrolled in a university health-related degree (third year or higher); living and studying in Australia; and 18 years or older. Purposive sampling was used to recruit participants across Australia and from different study disciplines. In an earlier study phase (unpublished), we conducted a needs analysis survey with healthcare students (see Figure 1) on the content of a new digital frailty education course. Survey participants were asked if they consented to being contacted for future phases of the research, including the current study. Recruitment methods for the needs analysis survey included emailing university course coordinators to distribute information to students; snowballing techniques (where participants invited their student networks to participate); social media advertising; and advertising via newsletters (eg, Australian Frailty Network’s Frailty Nexus). Participants expressed their interest in participating in the needs analysis survey through an online form, or by emailing the research contact person. Participants were recruited to focus groups and interviews until data saturation was reached.

Data Collection

Participants completed a short demographic questionnaire ([Supplementary A](#)). Consent was obtained by the study participants prior to focus groups and interviews, which were conducted in August and September, 2023, via Zoom or Microsoft Teams. The focus group/interview guide was informed by a literature review and consultation with the research team ([Supplementary B](#)).

Each interview/focus group commenced with participants sharing their understanding of frailty. Facilitators (KL and BL) then presented the project definition of frailty to establish a shared understanding of frailty. Participants were asked about their previous participation in education about frailty or the care of older adults, as well as their ideas for the content of the new digital education course. Ten potential education module topics were shared with participants (derived from our previous needs analysis survey), which they ranked by level of importance and the order of presentation of module topics in the course. At the end of the interview or focus group, participants were invited to complete an optional Research Engagement Feedback Survey about their research experience ([Supplementary C](#)). Participants were remunerated for their time with an AUD\$30 electronic gift card.

Interviews and focus groups were video and audio recorded, with automatic transcription via the online meeting platform. Transcripts were downloaded into a Microsoft Word file and edited for accuracy by SM. Reflective fieldnotes were recorded after each focus group/interview noting initial impressions of patterns in responses and the group dynamics (how participants interacted with each other).

Analysis

Descriptive statistics were used to analyze quantitative data (demographic data and data from the Research Engagement Feedback Survey). Qualitative data were inductively analyzed using template analysis,²⁹ a type of codebook thematic analysis. KL, SM and BKK read through transcripts for familiarity and independently coded a sample of transcripts (n = 3; 27%). The three researchers met to discuss their coding and collaboratively devised a coding template. This process involved merging and refining codes, relabeling codes, creating a hierarchical coding structure, and identifying themes. The researchers then coded all transcripts (including re-coding the transcripts from the initial sample) using the coding template. Each transcript was coded by all three researchers. The researchers worked together to update and adjust the coding template throughout the coding process via emails and online meetings. This iterative process resulted in new codes being identified, existing codes being adapted, and themes being refined. KL and SM met to finalize themes, which were reviewed by BL and BKK. To ensure that themes encapsulated key findings, KL reviewed the themes against researcher fieldnotes.

Results

Ten students (58.8%) participated in focus groups, with an additional seven participating in individual interviews (41.2%). The four focus groups comprised 2–4 participants and ranged from 29 to 37 minutes (mean = 33 minutes). The seven interviews ranged from 19 to 29 minutes (mean = 24 minutes). Most participants were female (64.7%), aged 20–30 years (76.5%) ([Table 1](#)), and enrolled in either their third (58.8%) or fourth year (17.6%). Further demographic information is presented in [Supplementary D](#). Most participants resided in inner-city (58.8%) or suburban areas (23.5%),

Table 1 Participant Demographic Characteristics

	n (%) [*]
Age range (years)	
20–30	13 (76.5)
31–40	2 (11.8)
41–50	1 (5.9)
51–60	1 (5.9)
Gender	
Female	11 (64.7)
Male	4 (23.5)
Did not answer/prefer not to answer	2 (11.8)
Self-described	0 (0)
Healthcare discipline	
Dietetics	2 (11.8)
Medicine	6 (35.3)
Nursing	3 (17.6)
Occupational therapy	5 (29.4)
Physiotherapy	1 (5.9)

Note: ^{*}Some values do not add up to 100% due to rounding.

with participants recruited from five Australian States. Five study disciplines were represented, with most participants studying medicine (35.4%) or occupational therapy (29.4%) (Table 1).

The results of this study are presented as five parts. Part A presents themes; Part B outlines desired module content; Part C summarizes additional suggestions about optimizing learning in the course; Part D presents course name suggestions; and Part E summarizes the Research Engagement Feedback Survey results.

Part A: Themes

The analysis resulted in four themes: 1) Perception of frailty as loss and decline; 2) Limited education on frailty; 3) Frailty education connected to the reality of practice; and 4) Learning and practicing person-centered care (Table 2).

Perception of Frailty as Loss and Decline

Participants conceptualized frailty in terms of loss and decline. This included changes to health that were often viewed as a gradual decline as part of the aging process. They associated frailty with loss of functionality, mobility, and capacity to carry out daily living activities. Participants recognized that frailty impacted people's independence and that people who were frail needed greater levels of support from others.

For me, it's [frailty is] more of like a general decline in like, older people when they need the extra, like care and support, and just be gentle with them, because they ... don't function as well as ... they used to.¹ (P1 - Nursing)

Participants primarily associated frailty with physical decline, particularly strength and speed. People who were frail were described as slower, underweight and physically weaker.

I guess whenever someone says they are frail, I just picture, like small frame, very weak, moves very slowly. (P3 - Physiotherapy)

Frailty was viewed as an accumulation of problems, with participants recognizing the relationship between frailty and chronic illness, co-morbidities, and disability. Frailty was said to result in greater risk of complications and negative outcomes, including hospital re-admission, fractures, and falls. Participants explained that people who were frail had lower resilience, meaning they were slower to recover after illness or injury.

... when one condition starts and it becomes chronic, then it tends to get worse and worse ... and what happens I think is, it starts to compound and ... if the patient doesn't bounce back or get better quite reasonably quickly from their ... first

Table 2 Overview of Themes

Themes	Description
Perception of frailty as loss and decline	Participants understood frailty as a gradual decline in health, particularly physical health, leading to poor health outcomes. Frailty was said to result in loss of independence, strength, speed, mobility, function, and resilience. Frailty was generally, but not always, associated with aging and older adults.
Limited education on frailty	Participants described limited formal education on frailty where frailty was often covered as optional content rather than being the focus of education. Participants' understanding of frailty instead came from their clinical placements and experiences with older family members.
Frailty education connected to the reality of practice	Participants expressed that frailty education should provide practical skills-based training through hands-on experiences and detailed clinical scenarios. They also wanted frailty education to reflect the lived experiences of patients through case studies, storytelling and videos.
Learning and practicing person-centered care	Participants recognized the importance of person-centered care and expressed a desire to learn about how to apply this approach in practice. Participants conceptualized person-centered care to involve shared-decision making, communication and interactions, getting to know patients, and individualized care.

hospitalization, for example, we often see them return, re-present to the hospital and the health outcomes and the prognosis is definitely worse. (P16 - Medicine)

Frailty was more commonly associated with *physical* decline, with few participants also recognizing cognitive, emotional, and spiritual aspects of frailty.

From my understanding, you can divide it [frailty] into a couple of frameworks, whether that be physical fragility, emotional, or spiritual. (P16 - Medicine)

Frailty was often spoken about in relation to older adults, aging and people living in aged care homes. Some participants recognized that while frailty is associated with older age, frailty and ageing are not the same thing.

I associate frailty to aged care and so people with a specific demographic, but frailty is not specific to ... elderly people. I mean ... it's something that people in other age groups can go through or can experience. (P14 – Occupational Therapy)

Limited Education on Frailty

Participants agreed frailty is neglected in formal education, as it was either covered minimally in curriculum or not at all. They reported that topics *related* to frailty were taught, for example, manual handling, aging, and geriatric conditions, but frailty was never the focus.

... but in terms of my studies – the three years that I've been – well almost three years now, I haven't come across that term [frailty] at all at uni. I suppose we have done lots and lots of work looking at older populations but its more condition centric ... (P9 – Occupational Therapy)

I haven't been taught [about frailty] much either, like there's no modules or courses to complete as part of our program. Whatever we've seen is through other rotations that we've done. So, for example, in psychiatry, you get to do a little bit of age psychiatry, so, you learn from that, but nothing that focuses on frailty or anything like that, in my experience. (P2 - Medicine)

Some participants explained that education on frailty was not assessable content and was therefore optional or additional content.

For my course, it [frailty] kind of took the sense of, this is a fun to know rather than a need to know basis. There was no like assessment afterwards. (P6 – Occupational Therapy)

Participants acknowledged that limited formal education on frailty led to a lack of understanding about frailty. Some participants reported feeling unprepared for working with frail adults as they had not received enough training.

But I felt like we weren't really ready or trained correctly for ... how fragile people can be. (P7 - Nursing)

Several participants recognized the importance of frailty education and wanted to learn more about frailty, particularly prevention and identification of frailty.

I think in terms of having like an aging population, particularly in Australia, I think it's [frailty is] a particularly vital thing to know more about as a healthcare student. And I feel like we'd all be better healthcare professionals if we had the opportunity to learn more about that. (P11 – Occupational Therapy)

... maybe like when it's relevant to really consider frailty as an important aspect of treating patients and how ... being able to identify them at different levels of frailty can affect your management of the patient as well. And maybe more of what goes into identifying just how frail a patient is, so are there specific criteria that you can use to be like, 'oh, yeah, this patient is very like ... on one end of the frailty scale or not'. (P10 - Medicine)

Participants said that their knowledge of frailty and older adults mostly came from their experiences in clinical placements, particularly aged care and hospitals.

And same as like when we actually do our placements, we learn more when we're actually out there than we do at uni, because it's just like the knowledge, if that makes sense. (P1 - Nursing)

While aged care placements were mandatory for some participants, other participants said that their cohort got to choose placements, or they got assigned to placements other than aged care.

Towards the end of the first year, all nursing students have to do an aged care placement for a month ... and that's your first exposure to real sort of nursing, and that was in a nursing home. (P5 - Nursing)

We've had a placement in second year, and that was to either be sent to an aged care place or a pediatric place. So, I got sent to pediatric placement, so I didn't really get too much exposure for the aged care home. (P6 - Occupational therapy)

Other sources of knowledge about frailty came from employment, volunteering experiences, or personal connections with older adults, particularly grandparents.

But back in Singapore, I think it's quite relevant because my grandparents are quite frail. And I have a lot of interactions with certain members of the community, particularly my church, because it's really like an aging population back in Singapore. So, [I am] quite sort of familiar with it, I'd say. (P8 - Dietetics)

Frailty Education Connected to the Reality of Practice

While participants acknowledged the importance of a theoretical basis to education, they explained that they wanted applied knowledge. Some participants found value in hands-on-experience such as clinical placements.

And I think even the students a lot of the time we're not doing the actual healthcare bits – providing healthcare – we're just there watching. So, if we have these small things that we can help out with, I think that would be helpful as well and make us feel more of the team. And you know, maybe improve the patient's journey through hospital. (P16 - Medicine)

Other participants expressed that presenting clinical scenarios in digital frailty education could facilitate applied learning and develop practical skills.

I personally like when there are real case scenarios, so real life situations, they are part of the training ... something that might really happen in a clinical situation ... that's very helpful, because that gives you the understanding, and also some practical skills that you can use when you enter the workforce. (P14 – Occupational Therapy)

Participants wanted the education course to reflect the real-world and expressed that including lived experiences would facilitate learning. Participants said that lived experiences could be shared in a digital format through storytelling, videos and detailed case studies.

... also seeing the things from their [patients'] perspective, because it's also important to hear those voices coming through. And I think there was [in an existing module] some examples of people talking directly about their own experience, or what it means to them going through feeling vulnerable, feeling frail ... So that was useful. (P14 – Occupational Therapy)

Learning and Practicing Person-Centered Care

Participants conveyed the importance of person-centered care and the need to apply this in practice for the care of frail or older adults. Person-centered care meant different things for different participants. For some, it was about understanding individuals' preferences, culture, and circumstances, and treating them like an individual.

... Because at the end of the day we're talking about human beings, with you know, all the imperfections and passions and biases and all the, you know, intricacies that we have. And that just doesn't translate when you talk about a standardized model. (P9 – Occupational Therapy)

... sometimes some staff can have ... not like a confirmation bias, but they can think that because somebody is old and frail, all of them must have dementia, which is a good chance of time, not the case. Maybe the reason they just don't want to eat this and that is because they just don't want to, or they have eaten whatever it is their whole life, and it's, you know, part of their culture. (P7 - Nursing)

For others, person-centered care was about involving patients in collaboration and shared decision-making.

Whereas providing person-centered care—if you teach that first, it definitely flows better into all the other things. And how you can increase, like, maybe the acceptability of the patient, or the patient’s acceptability of you, maybe working together with them to create a solution. (P8 - Dietetics)

Participants expressed wanting to learn more about considerations when interacting with older and frail adults. Specifically, participants spoke about communication (verbal and non-verbal), volume of speech and spatial awareness.

So how you, like, face-to-face interact with a client or patient. I think sometimes that can be very different to how we do it with younger people ... I think the language that we use can sometimes be not overly appropriate for people of an old age or frail people, or even people with disabilities sometimes ... more the underlying interactions and rapport building to get to that stage, I suppose I think is what we miss in our courses for sure. (P13 - Dietetics)

That actually reminds me of my placement when I was trying to talk to this elderly person, and she just look really confused. So, and then she did say “louder”, and then again, “louder, louder”. So, I had to speak really, really loud. But yeah, key point on the interaction bit, like what we need to know when interacting with the with the elderly person. (P15 – Occupational Therapy)

Part B: Module Topics

Participants largely agreed that all 10 module topics presented in the focus groups/interviews ([Supplementary B](#)) were important to include in the education course. ‘Identifying and assessing frailty’, as well as ‘understanding ageing, frailty, and geriatric conditions’ were topics consistently prioritized by students; however, perspectives diverged on the presentation order and importance of other topics. A common discussion point was the prioritization of person-centered care and its relevance for related consumer-focused topics such as goals of care and shared decision-making, treatment decisions for older people or patients who are frail, and optimizing the acute care environment. Some participants suggested that person-centered care should be incorporated across all modules, rather than a stand-alone topic.

Part C: Strategies to Optimize Learning

While participants were not directly asked about the functionality or design of the education course, several participants provided suggestions to optimize students’ learning. Several participants spoke about the need for simple, ‘bite-sized’, and succinct modules. They expressed a preference for a clear structure to the course to guide learning through the modules. Participants also suggested incorporating visual and audio materials into the course to facilitate learning and engagement. This feedback will be incorporated into future phases of the research project, which will focus on co-designing functionality and interactive components of the education modules, as well as learner engagement.

Part D: Course Name

Participants expressed mixed views on the course name but agreed that it should be memorable, and sound interesting or important, while also being short and catchy. ‘Fundamentals of Frailty’ and ‘Focus on Frailty’ were the most popular names as students expressed that they were catchy and succinct. Participants’ opinions diverged on the use of the term “eLearning”, (eg, in the proposed name: ‘Australian Frailty Network eLearning Modules’). While some participants said that this term sounded official and trustworthy and that using ‘Australia’ in the title helped to contextualize the course, others explained ‘eLearning’ was overly academic-sounding, uninteresting, and implied a lot of work.

When you’re working—and when you see ‘Learning Module’, it’s like ‘Oh here’s something else’ ... I would feel like it’d be something that would just bore me to be honest. (P7 - Nursing)

Based on responses from student participants, and input from health professionals and consumers in our related studies, the digital education course will be named *‘Focus on Frailty’*.

Part E: Research Engagement Feedback Survey

Thirteen of the 17 participants (76.5%) elected to complete the Research Engagement Feedback Survey. Mean responses were consistently high to survey questions: “How would you rate your experience with the focus group/interview?” (mean = 4.9/5 stars); “To what extent could you take part in the discussion as much as you wanted to?” (mean = 9.6/10); “To what extent did you feel that you could talk about your thoughts and ideas?” (mean = 10/10). Qualitative responses to open-ended questions were consistently positive, with participants reporting that during interviews/focus groups they felt “listened to” and “safe” and that their ideas were “important”.

The researcher was lovely and made the session seamless, safe and comfortable to express any opinions that we felt important.

Some participants explained that they valued the opportunity to contribute to a project that would have real-world impact and that their contribution was enhanced by being able to share their perspectives and experiences.

I like the idea that my thoughts and beliefs may help shape a tool for others to use, and that ultimately this could positively impact clients.

Discussion

In this study, frailty was conceptualized in terms of loss and decline, specifically, loss of functionality, mobility, strength, speed, and independence, as well as co-morbidities and aging. While frailty is associated with physical deficits,³⁰ few participants recognized other aspects of frailty, including cognitive, social and emotional components.^{3,4,31} Previous literature shows that healthcare professionals and students vary in their knowledge of frailty as a multi-faceted state, with some students perceiving frailty from a physical standpoint, while others have a more holistic understanding.^{32,33} Research also demonstrates that healthcare professionals and students often hold the misconception that frailty and aging are the same.^{15,32} Nimmons et al (2018) found that geriatric medicine education modules were able to somewhat address frailty misconceptions.¹⁵ In their study, 4th and 5th year medical students demonstrated pre-post module improvements in their knowledge of frailty, including greater recognition of frailty as a complex and multi-faceted state, and acknowledgment that frailty is not an inevitable part of aging.¹⁵

In alignment with international research,^{14,15,34,35} we found that healthcare students received limited education about frailty and that this lack of education led students to feel underprepared to care for people living with frailty. Frailty was rarely the focus of education, and if mentioned, it was either an optional or non-assessable component. Whilst this study reflects Australian students' views, similar findings have been demonstrated in Warren et al's (2022) systematic review, which found that internationally, frailty education is often embedded within broader geriatric training rather than a central focus of education.³⁴ Winter et al's survey of 34 medical school educators in the United Kingdom reported that frailty was limited to geriatric medicine curriculums.³⁵ Participants in our study explained that most of their exposure to frailty occurred through clinical placements on geriatric wards or aged care homes. This further echoes Winter et al (2021), who found that frailty was often taught “opportunisticly” through student observations on geriatric ward rounds.³⁵ Similarly, Nimmons et al (2018) reported that healthcare students described receiving limited dedicated training on frailty and that their exposure to frailty was mostly through ad-hoc experiences at geriatric hospital wards and in general practice.¹⁵

Supporting previous literature,³⁶ students in our study expressed a desire for skills-based training with practical application, advocating for hands-on training and detailed clinical scenarios to facilitate learning. Warren et al's (2022) systematic review found that frailty education often focuses on increasing frailty awareness, rather than developing practical skills for healthcare professionals or students to assess, manage or treat frail patients.³⁴ Aligning with existing research,^{37,38} participants also said that they wanted to learn more about person-centered care, including communication skills and interacting with older adults. Training characteristics recommended to be beneficial for learning about frailty, person-centered care, and/or interacting with older adults, included multidisciplinary approaches; case studies and clinical scenarios; building on prior knowledge and experiences; and addressing practical considerations regarding barriers to frailty-focused care.^{17,34,39} Furthermore, Ross et al's (2015) systematic review on the effectiveness of educational interventions for healthcare students found that interventions that incorporated interactions with real patients

had a positive impact on students' attitudes toward older adults.³⁹ While digital education programs are unlikely to offer opportunities to interact with patients, they can provide external activities additional to course requirements. By way of example, Samra et al's (2013) systematic review of interventions to improve medical students' and doctors' attitudes toward older adults suggested that practical learning could be facilitated by encouraging students to seek out experiences with older adults or listen to the experiences of older adults to simulate understanding and empathy towards older age.⁴⁰ We found that students wanted frailty education to reflect the lived experiences of patients. The inclusion of lived experiences, reflective activities and storytelling in education has been found to facilitate learning across different disciplines.^{41–45}

Study Implications

In our study, and previous research, healthcare professionals and students report limited or no formal frailty training.^{14–16} Given the aging population, high prevalence of frail patients in hospitals,^{9,10} poor outcomes and adverse events associated with frailty,^{7,8} and barriers to frailty-focused care in hospitals,¹ there is a need for frailty education focused on the hospital setting. Some participants in our study expressed a desire for more frailty-focused education. Research shows that education on frailty, geriatric medicine, and caring for older adults can improve students' attitudes, knowledge, and confidence regarding the care of older adults and people who are frail.^{14,15,18} However, healthcare professional entry-to-practice curriculums are not standardized, and content related to frailty varies between degrees and universities.¹⁵ Digital modules provide an opportunity for open access and inclusive frailty education. Findings from our study have informed the course name, 'Focus on Frailty', and will directly influence the design of module topics and course content. While our education course is co-designed for the Australian context, our findings have broader implications for international audiences who are looking to design frailty education for students. Based on our research, we recommend that frailty education should be skills-based, encourage practical application of knowledge, feature storytelling and lived experiences, take a holistic approach to frailty, and teach person-centered care. We also found that students wanted a course name that is catchy and succinct. We recommend that researchers, educators and healthcare professionals collaborate with students and other relevant stakeholders when designing frailty education to ensure that the content is relevant to their local context.

Strengths and Limitations

A key strength of this research is the use of co-design methodology, in which the research team collaborated with healthcare students in the design of the new digital frailty course. This collaborative approach is exemplified in participants' responses to the Research Engagement Feedback Survey that conveyed that participants felt they could engage in the research activities as much as they wanted to and share their thoughts and ideas. While data saturation was reached with 17 participants,⁴⁶ our sample had limited representation from different allied health disciplines, which may have introduced selection bias. It is possible that additional education module topics and content may have been generated by participants from other allied health disciplines. Overcoming this limitation, Focus on Frailty will be derived not only from the results of this study but also from co-design research activities undertaken with healthcare professionals working in a variety of disciplines, as well as caregivers and consumers (Figure 1). While we did not recruit participants from all of Australia's eight states and territories, five states were represented in this study, including participants living in inner-city, suburban, and regional or remote locations. There was a gender bias in this study as the majority of our participants were female (~65%); however, this figure is reflective of the gender imbalance in Australia's healthcare system, with females making up 74% of the healthcare workforce in 2022.⁴⁷

Conclusion

Seventeen university students enrolled in health-related university degrees shared their experiences, perspectives and design ideas regarding frailty education to inform the co-design of a new digital education course on frailty in hospitals called 'Focus on Frailty'. Study findings will be used to inform frailty education that is relevant to the Australian hospital context, co-designed with healthcare students and reflects the experiences of students across medical, nursing and allied health disciplines.

Ethics

This study was approved by the University of Queensland Human Research Ethics Committee (2023/HE001009). All participants provided informed consent, including consent of anonymized responses/direct quotes.

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Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception (REH, NW, RS), study design (KL, BL, REH, NW, OG, RS), execution and acquisition of data (KL, BL), analysis and interpretation (KL, SM, BKK, BL), or in all these areas. KL and SM drafted the manuscript and all authors took part in revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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