Designing for Distance Nursing: Reconnecting Nursing Students with Senior Home Residents during COVID-19

During the COVID-19 pandemic, nursing students were compelled to receive remote geriatric education due to social distancing mandates. However, for older adults who lack technology literacy, there has been limited access to remote nursing assistance. Although the mandate has been effective in reducing virus transmission, it has imposed a double burden on older adults' social isolation and has also restricted traditional geriatric nursing education for nursing students. To reconnect nursing students with older adults, we present research evaluating existing remote educational strategies in isolated care of older adults. We conducted surveys with nursing students and older adults to examine the extent of social deprivation during COVID-19 and their desires and needs in current remote care. These findings then informed our designs for interventions to connect more deeply with older adults, including thematic games, digital journals and information flyers for virtual and face-to-face assessments to support remote geriatric nursing interactions.

Keywords: design for older adults; nursing and design; nursing education; COVID-19 and design

1   Introduction

COVID-19 has disproportionately affected the older adult population, as morbidity and mortality rates among adults over 65 years of age have largely increased (Mueller et al., 2020). This has caused many older adults to isolate themselves. Research shows that social isolation leads to increased mortality (Holt-Lunstad et al., 2010) and susceptibility to negative disease outcomes (Holwerda et al., 2014; Tomaka et al., 2006), and social isolation is especially prevalent among older adults who live alone in residential facilities. Moreover, older adults in these facilities generally require in-person assistance to help them manage their healthcare needs. During the pandemic, however, there have been strict restrictions on who can access the facilities, which raises concerns about the health and well-being of this at-risk population (Lai et al., 2020).

There is a lack of scholarship concerning the level of healthcare support that has been provided to older adults in residential facilities during the COVID-19 pandemic, making it difficult to determine whether older adults in these facilities have had proper access to healthcare services, such as health assessments. In this project, we formed a team of scholars from nursing, service design and game

design to create a system that connected senior residents from an assisted living home with nursing students from a local community college.

In this article, we provide an overview of our work on connecting nursing students and senior residents throughout the COVID-19 pandemic. Initially, students were allowed a limited number of visits for in-person health assessments for older adults. Therefore, our efforts focused on designing materials that included information about the facility's social distancing procedures for in-person visits. In the winter, however, the policy required that the nursing students move completely to virtual mode. A series of wellness lectures were given via Zoom meetings to make up for the reduced in-person meeting times. We evaluated the impact of these virtual nursing education classes on both nursing students and older adults. Currently, the team is creating a series of games to support the wellness lectures, a digital diagnosis form for virtual assessment and an onsite health assessment protocol flyer.

2   Background

Health-related ageing and care services in later life are a great concern for ageing adults, especially those who live alone without traditional family care. The percentage of older adults living alone today increases from 28.5% between the ages of 75 and 84 to 39% for those 85 years and older, even without considering COVID. Dependence on services increases for older adults, while control over physical abilities and mental cognition decreases, limiting their ability to function, especially in lockdown scenarios (Tomaka et al., 2006). Thus, there is a need to study the factors and patterns of health and related services that can support older adults' healthy longevity in their independent living, especially during the COVID-19 pandemic. For instance, social isolation and loneliness were heightened in the older population during COVID-19 due to the inability to provide in-person care (Harden et al., 2020).

Furthermore, COVID-19 has led to unprecedented changes in the way nursing education approaches elderly care due to the contrasting health and safety needs, which lead to distancing, and the needs of care and connection, which lead to autonomy and well-being. Programs around the world have approached this question differently, including e-learning and virtual reality scenarios, such as nursing programmes in Taiwan for example (Liu et al., 2020). The burdens and difficulties of these remote education strategies have led to studying Zoom as a platform for maintaining connection; however, they tend to not provide the connection needed for elderly care (Suliman et al., 2021). Other technology interventions can also be difficult to adapt to due to the lack of acceptance of technology in the daily lives of older adults in long-term care (Chang, 2015).

Recent approaches to address low technology literacy in older adults' remote education include audio-visual programmes, basic technology-based telehealth and electronic records that attempt to lower technological barriers (Edelman et al., 2020). These interventions walk the fine line between using creative innovations and providing simple enough systems that the elderly can use and accept them. These types of programmes have raised awareness of designing systems specifically for older adults that address connection and health-safety outcomes during COVID-19 (Vergara et al., 2020). However, these technologies have not been explicitly adopted in nursing education, where both difficulties of care for the elderly and difficulties in educational outcomes are concerns in the design

of strategies and technologies for long-term health care. Thus, in this study, we investigate nursing students' current educational difficulties as well as a qualitative understanding of the needs of the elderly to create designs and strategies for effective nursing student interventions, both for education and for long-term care, during COVID-19.

3   Methods

We interviewed two nursing students, a faculty member who teaches a nursing course and two regional wellness nurses who coordinate the health programme at a local senior home. The goal was to assess the current state of a programme that invites nursing students to interact with older residents at the senior home, to discuss the difficulties throughout the pandemic and to brainstorm how the programme could be improved. We also disseminated two surveys: the first solicited feedback from the nursing students about their educational experiences during the pandemic, and the second surveyed older adults who participated in the virtual education sessions conducted by the nursing students.

The nursing students' survey included 29 questions. The first 23 Likert-scale questions were geared towards measuring students' sense of autonomy and their emotions when interacting with older adults. The remaining items were multiple response and short essay questions that asked the participants to reflect upon their interactions with older adult patients in the virtual nursing education program. We collected 31 responses from the students who were taking the course in the 2021 spring semester and who are registered for the course for the 2021 fall semester.

The survey that we conducted with older adults included four Likert-scale questions to determine how virtual nursing education impacted their health literacy. We also included three open-ended questions to collect feedback about the virtual education sessions with nursing students. We collected eight responses from the residents who participated in the wellness programme and interacted with the nursing students between fall 2020 and spring 2021.

4   Results

For the students' survey, we separated responses according to whether the participants attended virtual nursing education and used divergent stacked bar charts to visualise the Likert scale distribution (Figure 1). The figures herein show that existing nursing education does not highly influence how students evaluate their sense of autonomy and positivity during the COVID-19 pandemic. Most students retained a good sense of control in their daily work and life interactions and their own positive emotional feelings in connection with older adults. Furthermore, the Kruskal-Wallis test also revealed that students' autonomy ($p = 0.3009$) and positivity ($p = 0.8302$) were not statistically affected by attending virtual nursing education.
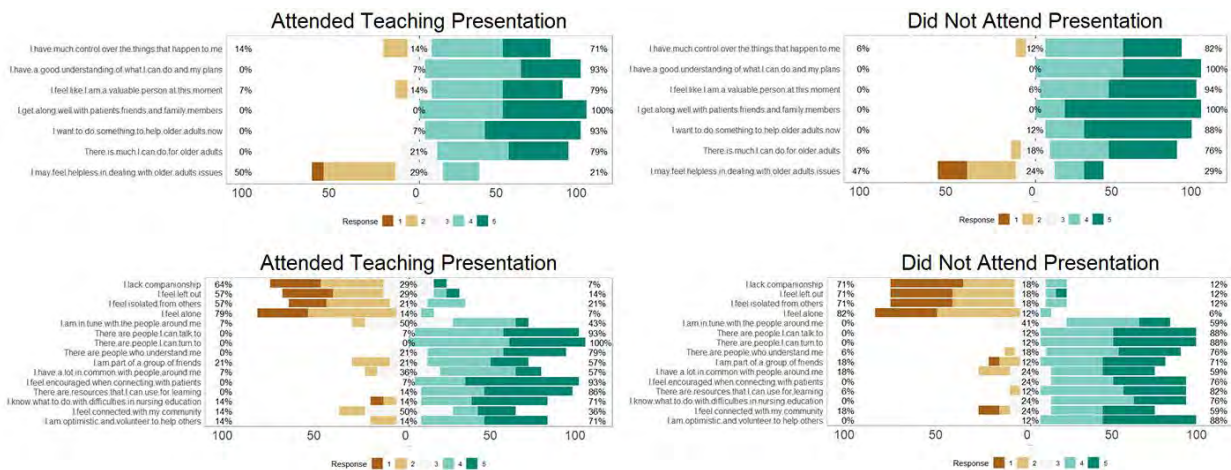
Figure 1. Survey of nursing students: Raw Likert scale ratings of autonomy and positivity measures separated by whether the participants attended virtual nursing education (n = 31).
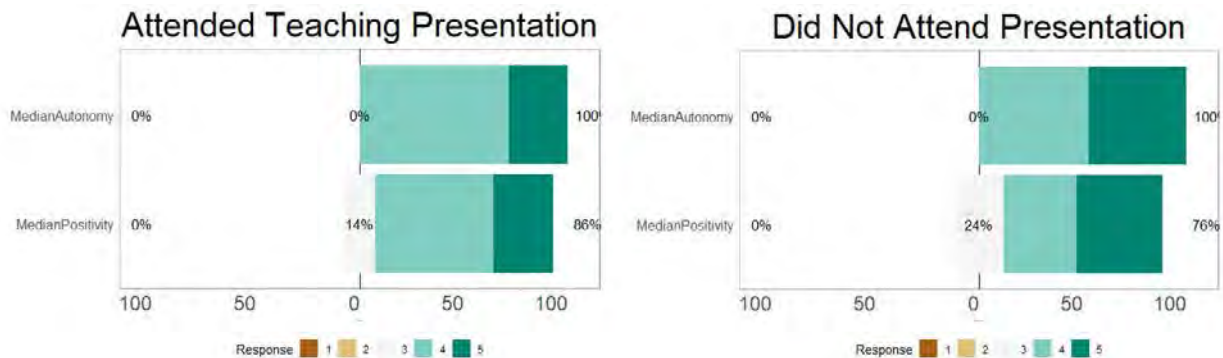

Figure 2. Survey of nursing students: Aggregated results using the median of the various scales designed to measure autonomy and positivity, separated by whether the participants attended virtual nursing education (n = 31).

In the multiple frequency results (Table 1), only half of the students considered their current virtual nursing education to be positive, and over half were worried about the learning experience and their clinical skills efficiency. Additionally, half of them agreed that there should be more opportunities to integrate virtual theory with face-to-face clinical practise, and over half wanted to have more opportunities to practice skills while in clinical. Students' positive responses to virtual education and their concerns about practical clinical skills demonstrate the dichotomy in current nursing education. They articulate a situation such as "a mixture of emotions – I enjoy that lectures are online now and recorded," but "in clinical settings, my education is being/will be compromised because of restrictions in the pandemic." For one student who had not presented lectures for older adults, "interacting" with a virtual "patient" on a computer programme for clinical experience was not good preparation for caring for actual patients in clinical settings. However, most of the students who had already participated in the educational sessions responded very positively (Table 2) and reported that the experience made them feel "relieved" and "accomplished."

Table 1 Frequencies in students' evaluations and expectations of current virtual nursing education.

Questions	Responses	Responses		Percent of Cases
		N	Percent	
How do you feel about the virtual nursing education during COVID-19?	I feel positive in my virtual learning experiences	16	35.6%	50.0%
	I am worried about my learning experience and the efficiency of clinical skills	18	40.0%	56.3%
	I feel the current hybrid learning experience should more robust and efficient	4	8.9%	12.5%
	I feel the current hybrid learning experience is good enough for nursing practices	2	4.4%	6.3%
	None of the above	5	11.1%	15.6%
	Total	32	100%	140.6%
How do you want to improve your nursing education as it relates to working with older adults?	There should be more online training	5	10.0%	15.6%
	There should be more opportunities to integrate virtual theory with face to face clinical	16	32.0%	50.0%
	There should be more time for teaching patients about health maintenance	8	16.0%	25.0%
	There should be more opportunity to practice skills while in clinical	18	36.0%	56.3%
	None of the above	3	6.0%	9.4%
	Total	50	100.0%	156.3%

Table 2 Main quotes from the students' feedback on the virtual health education programme.

Questions	Quotes
What do you anticipate would help you prepare for presenting to the senior residents?	"Activities and exercises to keep your mind occupied." "Learning how to communicate in an effective way to not come across as speaking too quickly or using nursing terms that they wouldn't understand. I would make sure to use therapeutic communication that allows them to express how they are feeling." "I would prepare myself by doing research on elderly understanding, and find examples of things that would connect best with them." "I am preparing by following the instructions to keep it within a certain time limit and making sure to accommodate for those who are not on video calls" "learn about the audience" "Assessing the learning needs and prior knowledge of the population I will be educating."
How did you feel after presenting to the senior residents?	"The residents were so excited and willing to participate and it made me feel so much better being able to bring something cheerful to their day." "I feel comfortable and confident in my abilities to educate the group of individuals who were present during the presentation." "I felt so much better. The older adults communicated and responded positively, and that definitely relieved my anxious feelings." "relieved" "accomplished" "Rewarded, happy, helpful, a part of" "I was really impressed by their knowledge and felt like the benefited from my reinforcements"
What is the biggest challenge of working with older adults remotely?	"Not being able to be face to face and really connect" "not being able to accommodate for their needs completely so the connection seems incomplete" "tailoring the presentation to accommodate for those who were unable to use iPads or computers to connect since they might have missed out on some information." "From my presentation a lot of the elders could not see our power point slide so that was disappointing" "The inability to put learned information to use and understanding the physical process" "Need more information about their mood and behavior changes"

In the survey that we conducted with senior residents (Figure 3), most of them responded very positively about the health education programme and gave positive feedback about the online sessions as opportunities to socialise with neighbours and students. Based on their quotes (Table 3), however, some older adults could only connect to Zoom via phone calls, which made it difficult for them to view PowerPoints. Therefore, to enrich the interactions between nursing students and older adults, we decided to explore different educational formats and create supporting materials. Instead of only asking nursing students to give lectures, we decided to utilise games to engage older adults and to create digital journals to track the health education programme for later reference.
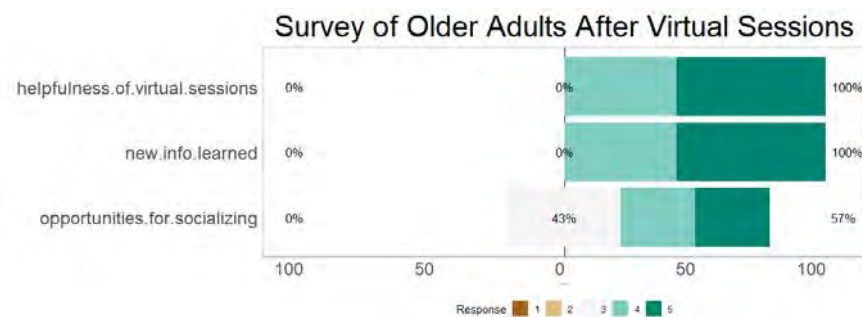

Figure 3. Survey of older adults showing the effectiveness of the virtual health education programme (n = 7).

Table 3. Main quotes from the senior residents' feedback on the virtual health education programme.

Questions	Quotes
How did you feel about your relationship with the students?	"I felt like I knew them a long time, they were very good" "it is difficult to socialize on Zoom, especially if you did not have an iPad or equivalent, many residents do not have one" "It was a win-win situation, helped the students with a relationship with other people, helped us to learn from students" "Because we weren't face-to-face, I didn't relate to each student as I might have, some students gave better presentations than others, overall, I enjoy them."
Did you feel like attending these virtual sessions helped you to ease the isolation during the COVID-19 pandemic?	"I like to do it to encourage the educational part, a very important part of nursing is providing it for a patient" "Yes, it did, it kept us from being too isolated from each other" "Yes, a reason to get together with other people" "…It was very hard to plunge into the "aloneness" and isolation… when the coffee hour became available on phone zoom and then the nursing students I felt "back" in society or living a real life. Both became virtual "real world living". I don't think I could overestimate those contributions to my sanity."
Do you have suggestions to improve the virtual education sessions? We would appreciate your feedback.	"It would be nice if we can return to an in-person session, they did an excellent job with the virtual" "A great program, hope it continues" "…I missed several words; it was especially frustrating if I wanted to hear a lot about that particular subject… I got the fact that I couldn't see any PowerPoint charts. I had only phone connections that may have the words spelled out and maybe a hint… if there were medical words, they were way out of my league…"

5 Design ideas

We are currently designing a service system to enhance the experiences of nursing students and older adults as they continue virtual interaction and to eventually combine it again with the limited onsite health assessment model as the vaccine enables the senior home to reopen.

5.1 Gamifying virtual wellness education sessions

From our survey of older adults, a key difficulty in conducting virtual education sessions was that older adults were participating in the Zoom meetings via phone calls. It was difficult to maintain their attention since they frequently have problems with technology in the telehealth context (Chang, 2015). To enhance the experience, we proposed incorporating games as the key activity of the educational sessions.

We designed three games to support health education. First, to quickly engage them and foster their attention in the lectures, we introduced BINGO as a way to teach health terminology (Figure 4). The game utilises healthcare terms to help older adults learn about health topics, such as arthritis, nutrition and heart disease. Second, to enrich communications among senior residents, we set up two teams and used bingo cards to play the game "Codenames" (Figure 5). Older adults were asked to guess word clues and identify their team's words on the card. Last, to help older adults make decisions about their health-related activities, we designed a health Farkle game (Figure 6). Each Farkle sheet contains activities for older residents to pick by rolling dice. Only by answering questions correctly during the online lectures did they earn points to change health activities.
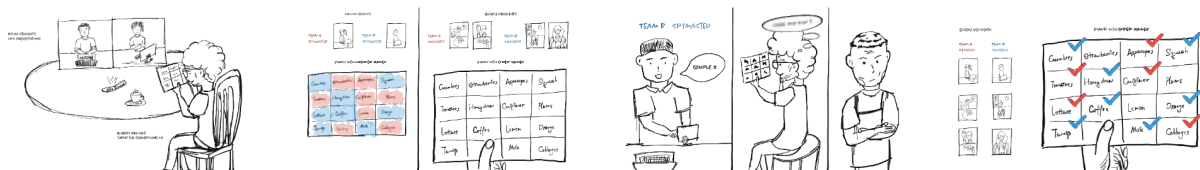

Figure 4. Health BINGO

Figure 5. Health Codenames

Figure 6. Health Farkle Game

5.2   Designing a digital journal for remote health assessments

Another problem that arose in the interviews was that the current programme brought in different nursing students each week to provide them with clinical interaction experiences, creating a disconnect between each session given by the individual students and their relationship with the senior residents. The team decided to focus on a health assessment report as a way to provide a system for the students to maintain a connection to the activities and observations of the previous students and to leave comments for the next students.

Previously, nursing students took notes on printed documents to record older adults' health information during on-site health assessments. However, due to pandemic restrictions, health assessment can now only be implemented remotely. We decided to digitise the documentation process to simplify the collection of personal data, including their background, medications and care plan (Figure 7). We also eliminated previous physical examinations and added mental assessments of older adults' loneliness and social isolation. Most importantly, the digitalisation of these forms enabled students to share information about the residents easily for seamless communication and collaboration to personalise health education.

Figure 7. Digital journal

5.3   Designing an information flyer to support in-person health assessments

Another area that needed design intervention was the individual health assessments in the residents' rooms. In Fall 2020, these in-person visits were allowed from time to time, depending on pandemic factors. There was no clear protocol, however, despite the anxiety of both the students and the residents.

The team created a flyer to provide social distancing guidelines for face-to-face meetings. We based our guidelines on existing CDC recommendations and then revised the design based on feedback obtained from the regional wellness nurses and the professor of the nursing class. Thereby, we ensured that the design addressed the needs of both the senior residents and the nursing students. The final version was made with pictograms depicting the protocols that both residents and nursing students must follow. These flyers helped both parties feel more in control because they could trust the process, knowing that everyone understood the protocols that guided social interaction.

The first page of the flyer provides action plans for what should be done before, during and after the session. The second page contains general information about COVID-19 concerning the individual context and recommendations to reach out for resources if there is a suspected symptom. We created two versions to cater to both colour printers and black-and-white printers, ensuring enough contrast and legibility for older adults.

Figure 8. Flyer design for COVID-19 informatics

6   Conclusion

We have presented our ongoing effort to utilise design to enrich the interaction between nursing students and the isolated senior residents at a local senior living facility during COVID-19. This research contributes to the field of design by exploring a novel area of nursing education in conjunction with designing for older adults' wellbeing. We also contribute to the field of nursing by utilising novel gamified virtual health education to improve the health literacy of older adults. We created virtual interactions that helped students appreciate elders and alleviated the frustration of reduced opportunities to meet with patients during the pandemic. For elders, a sense of connectivity and purpose in participating in the education of future nurses contributes to their wellbeing. These two aspects are mutually interrelated and are critical for the emotional support of both populations during COVID-19 and social isolation. In the future, we will hold workshops with nursing students and regional wellness nurses to obtain feedback for refining the design for continued use in the nursing students' interactions with the senior residents. Even after the pandemic, this service will empower older adults by providing them with opportunities to connect remotely with nursing students and/or nurses.

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