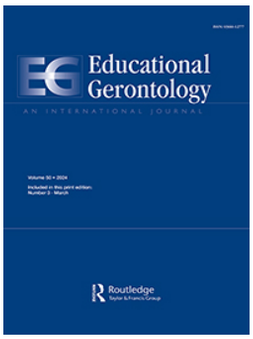

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Effects of an age suit simulation on nursing students' perspectives on providing care to older persons - an education intervention study

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ABSTRACT

Nursing students are important future health care providers to the growing number of older persons in society. However, two barriers are their common ageist attitudes and lack of interest in geriatrics. This is a concern in light of the global demand for nurses and a challenge that need to be addressed in nurse education. Age suit simulation has been shown to affect the attitudes of students toward older persons, but the important context of home is often missing from studies. Accordingly, the present study employed a quantitative approach with the goal of investigating the effects of aging simulation with an age suit in a home context as a part of experiential learning among second-year nursing students. The age simulation allowed the students to experience both specific and common health problems from the patient's point of view in a controlled environment and a relevant context: the home. Data were collected using a questionnaire in a quasi-experimental pretest – posttest design with a control group. Results showed that the intervention had a positive effect on various aspects of the nursing students' perspectives on caring for older persons. Work experience was associated with more positive attitudes. The control group was more negative toward geriatrics as a career choice than the intervention group. In conclusion, age suit simulation can be an innovative part of nurse education because it raises awareness and understanding of the health challenges of older persons, which are important in combating ageism among future nurses.

Introduction

The global rising number of older persons in the population is challenging for health and social care authorities, since aging often is associated with multiple long-term health problems and complex health care needs. Thus, rather than focusing on a single disease or comorbidity of older persons at a given point in time, their health must be considered from their own perspective and functions (World Health Organization [WHO], 2015). Registered nurses (RNs) are the largest workforce in the health care system and are central to the provision of health care to older persons (World Health Organization [WHO], 2020). In recent decades, policies on health and social care have been reformed from institutional care to home health care, which implies that persons' homes will be the main workplace of RNs in the future (Spasova et al., 2018). The home has been described as a part of an older person's identity but also a stronghold, a place for recovery and energy as well as for feeling connected to

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memories of loved ones (Gillsjö et al., 2011; Hestevik et al., 2019). It is thus not surprising that RN-led community-based care is also associated with reduced death rates and fewer hospital admissions of older persons with complex health problems (Bradbury & Lifvergren, 2016). To meet the dynamic health care needs of older persons, person-centered care (PCC) is suggested as a crucial component of health care provision, especially in a home and community-based long-term care setting. An important barrier in providing PCC is communication problems, which highlight the need for improving this skill in health care providers (Kogan et al., 2016). For nursing students however, community health care remains an unattractive career choice (Ng et al., 2019). This is a critical issue given the difficulty of recruiting RNs due to the global RN shortage, which is estimated to reach 5.7 million in 2030, to compensate for which the total number of RNs must increase by 8% yearly (WHO, 2020).

Ageism is a global issue that is widespread in society, media, and health and social care systems (World Health Organization [WHO], 2021). It is often reflected in nursing students as negative and unfavorable attitudes toward caring for older persons, which makes it difficult to recruit nurses for geriatric care (Kalogirou et al., 2021; Koskinen et al., 2022). Culture, poor gerontological and geriatric education with an overall lack of knowledge of the aging body (Hanson, 2014) have been identified as reasons for RNs' negative attitudes toward older persons. A systematic review (Venables et al., 2023) revealed that predicting the attitudes of nursing students toward older persons is complex and multifaceted and that increased knowledge about aging is associated with positive attitudes. Nurse education may address ageist attitudes by further developing an education curriculum regarding gerontology and geriatrics. However, research on the attitudes of nurse students in a health care context is needed since most studies only measure their general attitudes toward older persons. Studies have shown that nursing students enrolled in gerontology courses had less ageist attitudes than those who had not received such education and that the combination of theory and experiential learning had positive effects on ageism (Gallo, 2019). In contrast, nursing students reported that geriatric education was often misrepresentative, as older persons were only mentioned in the context of disease and disability and not normal aging. As a result of focusing on pathology and basic skills training, students reported that they were not prepared for the complexity of care associated with older persons, especially when cognitive impairment and communication were involved. Students may respond more positively toward caring for older persons if the education in gerontology and geriatrics is well structured, innovative, stimulating and interesting (Burbank et al., 2006; Garbrah et al., 2020) and if it includes a relevant context, such as a home environment (Salin et al., 2020). Given the declining number of nursing staff and the lack of interest of nursing students in gerontology and geriatrics, this issue is important to address in nurse education. Nursing faculty must confront ageism by engaging students in student-centered activities, such as simulations (Dahlke et al., 2020).

Overall, age suit simulation can be a relevant and useful methodology to increase the empathy and positive attitudes of nurse students toward older persons (Bearman et al., 2015; Sari et al., 2020). However, there are scarce contemporary research data on age suit simulations as study simulations over different cycles in nursing programs as well as over a broader spectrum of competencies (Coelho et al., 2017). Bearman et al. (2019) describe that simulation training in education can not only increase the confidence and specific skills of learners but also be a transformative experience that may have consequences for clinical practice even many years after the simulation experience. Negative emotions such as fear and anxiety during simulation are not uncommon and, importantly, can be a part of the learning process. Kolb (2014) defines experiential learning as the process through which knowledge is created by transforming experience and where learning is viewed as a continuous process. For experiential learning to take place, there has to be an element of confrontation with perceived ideas (Kolb & Kolb, 2018). Bauchat et al. (2016) argue that simulation-based training in a controlled environment in nurse education is key to prepare students for the complexity of care and communications skills required to care for older persons. Relloso et al. (2021) also conclude that a well-equipped clinical training milieu offers a safe place for students to develop clinical skills and build professional confidence. In addition, guidelines following an extensive research project on simulations

in nurse education highlight the importance of a realistic and safe simulation environment that promotes active learning (Alexander et al., 2015).

Gerontology and geriatric education in nurse education has the potential to positively affect the attitudes of students toward older persons. A relevant and well-constructed simulation environment is vital. Therefore, the aim of this study was to explore the effects of an age suit simulation education intervention in a home environment on the perspectives of nurse students regarding providing health care to older persons. Furthermore, the aim was to examine whether the effect was similar for men and women, and for students with no or a minimal work experience compared to those with extensive experience of working with older persons.

Ethical considerations

Ethical approval was sought for this study. The Swedish Ethical Review Board (Dnr 2021–04056) reviewed the application and decided that approval according to the ethical legislation was not needed due to the way the intervention study would be conducted with no collection of sensitive data. This study followed national ethical regulations and conforms to the Declaration of Helsinki (World Medical Association, 2013). It complies with the ethical standards for research, which means that the four ethical principles of respect for autonomy, beneficence, non-maleficence, and justice (Beauchamp & Childress, 2013) were considered. The researchers were well aware of the innate risk of a power imbalance between teachers and students. This issue was discussed extensively among the researchers prior to the study. Extensive work was therefore put into creating a structured introduction and information about the study, both written and verbal. The presentation clearly illustrated the teaching aspect of the simulations as separate from the research aspect. Another issue was that participation could not be anonymous as the researchers were active in the simulations, which were a part of the normal nursing program. This issue was also presented to the students, though it was explained that individuals could not be identified in the statistics

Method

Design

To investigate the perspectives of nursing students on providing care to older persons, this study adopted a quasi-experimental pretest – posttest design with a control group. To examine the attitudes of nursing students toward caring for older persons (distinct from their general attitudes toward older persons), the Perspectives on Caring for Older Patients – Short Form (PCOP-SF) scale was used. The validity and reliability of the instrument were investigated using exploratory and confirmatory factor analysis from two independent studies, which resulted in a nine-item scale (Burbank et al., 2018). To date, the PCOP-SF has not yet been used in an education intervention for nurse students in the context of a home environment.

Study intervention

The intervention, age simulation using an age suit to explore nursing students' perspectives on and attitudes toward older persons, was designed by the research team. The age suit used was the GERonTologic simulator (GERT) suit (Figure 1), which simulates normal aging and age-related health problems by restricting and impairing psychical and cognitive functions. It has various parts that can be assembled and combined to simulate specific consequences of aging and common health problems (www.age-simulation-suit.com).

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Figure 1. The GERonTologic simulator (GERT): A Description.

Persona used in the intervention

Before the simulations, each student in the intervention group was assigned a 'persona' that detailed specific health problems the student would experience while wearing the age suit. Each persona was unique and represented different health problems, such as problems with vision and hearing, musculoskeletal dysfunctions, neurological disorders, pain and chronic obstructive lung disease. The teachers assisted the students in wearing the suit when necessary.

Scenarios

Most of the scenarios were conducted in a highly accessible apartment. Each student performed five scenarios for approximately 50 min. The scenarios involved performing everyday chores – setting the dinner table, brushing the teeth, resting in bed, sit down and raise from an armchair, dusting the top of a bookshelf, writing down answers to some general and simple questions on a piece of paper, and using and interacting with various health- and welfare technologies and aids.

A pilot study to test the GERT suit and the scenarios was conducted in the fall of 2019 with 76 students, during which non-demographic data were collected, but all other aspects of the pilot study were the same as those of the simulations, so the pilot study was included in this study. Figure 2 shows the flow chart of the intervention.

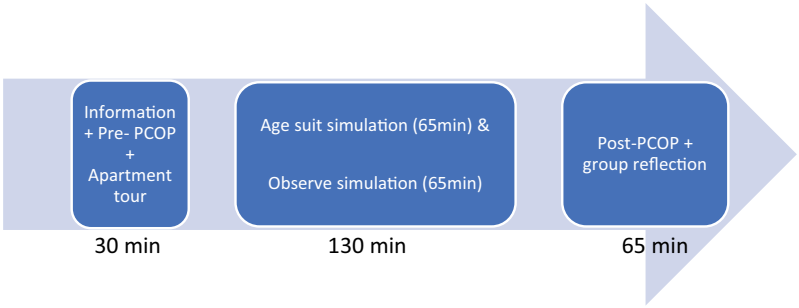

Figure 2. Flow chart of the education intervention.

Setting and participants

The simulations were performed in 2019–2022 at Skaraborg Health Technology Center (SHC), a health technology Center in a university in the western region of Sweden. SHC is a collaboration arena, knowledge center and testbed that focuses on innovation, research and education among actors in the public sector, business, academia, organizations, innovation actors and society at large. The simulations took place in SHC's highly accessible apartment, which is also equipped with health and welfare technology and other aids.

The participants in this study were 471 nursing students at a university in the western region of Sweden where 60–85 students were registered each semester. To become an RN in Sweden, completion of a three-year university-level program is required. Only nursing students who attended the fourth semester of the program were eligible for the study.

Intervention group

In the fourth semester of the university's three-year nursing program, the students take part in age simulations with the GERT suit at SHC as part of their mandatory education. The simulations are held in the fourth semester based on the progression of the content in gerontology and geriatrics education in the nursing program. In the second year of the program, there is a stronger emphasis on complex health problems and geriatrics than in the first year, which offers only an orientation on health and gerontology.

Control group

The control group also consisted of nursing students registered in the fourth semester in the academic year two. However, due to the coronavirus disease 2019 (COVID-19) pandemic, simulations with large groups of students were not permitted during that period. Thus, instead of taking part in simulations with the GERT age suit, the students in this group were asked to read and reflect on an article (Lee & Teh, 2020) about age suit simulation.

Data collection

Data were collected by asking all the participants to answer the PCOP-SF questionnaire both at the pre- and post-interventions, after they were informed about the study and after they gave their written informed consent to participate in it. All the students in the control group ($n = 72$) were digitally sent the same PCOP-SF that was sent to the intervention group, and 24 of them answered the questionnaire. The response rate in the intervention group was 471 pre and 464 post the simulation

PCOP-SF consists of nine questions on different aspects of caring for older persons. The answers are ranked on a five-point Likert-type scale, from 0 = *Strongly Disagree* to 4 = *Strongly Agree*. A high score indicates more positive attitudes. Negatively phrased questions are reversed in the analysis when

comparing scores (Burbank et al., 2018). After the students answered the questionnaire in the pre-simulation, they were given a tour of the apartment. Following the tour, students were randomly divided into two equal groups. One group was instructed to change into the age suit, and the other group was asked to go to the innovation room at SHC to observe the simulation on a whiteboard in real time. This was possible since the apartment is equipped with cameras in each room. Then, the two groups were directed to switch roles. When both groups had completed the simulation and observation, they were asked to answer the PCOP-SF again.

Data analysis

The data were collected from 471 participants pre-intervention and 464 post-intervention. As the data were not normally distributed, non-parametric testing was conducted using Mann-Whitney U analysis to compare differences in the students' attitudes to caring for older patients. The control group's mean score was compared to that of the entire sample, which included the intervention group post-intervention and the pilot study group post-intervention. Sub-analyses that compared differences based on gender and work experience were also conducted. In the comparison of the differences between genders, the male students were coded as (1), and the female students, (2). Work experience was dichotomized as (1) no work experience or less than two years' work experience, and (2) two or more years' work experience. The significance level was set at 0.05. The internal consistency reliability of the PCOP-SF ($N = 471$) using Cronbach's alpha was satisfactory at 0.79 (Brace et al., 2018). The statistical analysis was performed using the Statistical Package for the Social Sciences (SPSS) version 25.

Results

Pre-intervention

Intervention group

The intervention group pre-intervention consisted of male students ($n = 49$, 12.5%) and female students ($n = 343$, 87.5%). The students from the pilot study ($n = 78$) were included in the results of the PCOP-SF item scores but added no data to the gender differences and work experience differences, as demographic data were not collected in the pilot study. With regard to the work experience, 193 students (49.1%) had no or less than 2 years' experience, and 200 students (50.1%) had two or more years' experience (Table 1).

Control group

The control group consisted of 24 students—3 male (13%), 20 females (83%), and 1 undisclosed (4%). With regard to previous work experience, 12 participants (50%) had no or less than 2 years' work experience, and 12 (50%) had 2 or more years' work experience.

Comparison There was no significant difference between the intervention group and the control group at the baseline (as to age, gender, work experience and PCOP-SF score; Table 1)

The results for the intervention group versus the control group showed statistically significant differences in Items 2 and 9. The intervention group agreed to a higher extent than did the control group that it was frustrating to care for older patients. The control group ranked the item *Caring for older patients as an undesirable career choice* significantly lower than the intervention group. The mean total score showed no significant difference between the intervention group and the control group (Table 2).

Table 1. Participants baseline characteristics and pre-intervention PCOP-SF.

	$N = 495$	Intervention+Pilot ($n = 471$)	Control ($n = 24$)
Age, mean (sd)[a]	29.34 (7.37)	29.10 (7.28)	33.13 (7.92)
Sex[b]			
Male n (%)	52 (12.5)	49 (12.5)	3 (13.0)
Female n (%)	363 (87.5)	343 (87.5)	20 (87.0)
No or less than two years work experience (%)	197 (49.7)	193 (49.1)	12 (50.0)
Two or more years of work experience (%)	199 (50.3)	200 (50.9)	12 (50.0)
Working experience[c], mean (sd), (range 1–2)	1.51 (0.50)	1.51 (0.50)	1.50 (0.51)
PCOP-SF[d]			
(1) Caring for older patients is usually challenging and rewarding (sd)	2.89 (0.83)	2.88 (0.83)	2.96 (0.91)
(2) It´s frustrating caring for older patients (sd)	1.27 (1.01)	1.29 (1.00)	0.96 (1.04)
(3) Caring for older patients is often unpleasant work (sd)	0.88 (0.99)	0.86 (0.98)	1.17 (1.20)
(4) Caring for older patients is intellectually stimulating (sd)	2.45 (0.94)	2.44 (0.94)	2.79 (0.88)
(5) I would not choose to attend continuing education in nursing care of older patients (sd)	1.76 (1.30)	1.75 (1.30)	1.86 (1.42)
(6) Older patients are interesting to care for (sd)	2.76 (0.93)	2.76 (0.93)	2.83 (0.87)
(7) Caring for older patients is less rewarding than caring for younger patients (sd)	1.15 (1.07)	1.17 (1.08)	0.88 (0.85)
(8) Although caring for older patients is labor intensive it is worth the investment of time and energy (sd)	3.10 (0.85)	3.09 (0.85)	3.33 (0.82)
(9) Caring for older patients is an undesirable career choice (sd)	1.38 (1.16)	1.36 (1.15)	1.88 (1.26)

[a,b,c]Sex, age & working experience was not included in the pilot study.
[d]Scores are not reversed for PCOP-SF scale items, (range 0–4).

Table 2. Differences in post PCOP-SF score between the intervention and control group.

Question items, (range 0–4)	Intervention	Control	p*
(1) Caring for older patients is usually challenging and rewarding	3.07 (0.82)	2.96 (0.91)	.587
(2) It´s frustrating caring for older patientsa[a]	2.51 (1.07)	3.04 (1.04)	.012*
(3) Caring for older patients is often unpleasant work[a]	3.10 (0.98)	2.83 (1.20)	.337
(4) Caring for older patients is intellectually stimulating	2.54 (0.95)	2.79 (0.88)	.261
(5) I would not choose to attend continuing education in nursing care of older patients[a]	2.31 (1.30)	2.13 (1.42)	.616
(6) Older patients are interesting to care for	2.84 (0.92)	2.83 (0.87)	.726
(7) Caring for older patients is less rewarding than caring for younger patients[a]	2.89 (1.09)	3.13 (0.85)	.422
(8) Although caring for older patients is labor intensive it is worth the investment of time and energy	3.19 (0.89)	3.33 (0.82)	.471
(9) Caring for older patients is an undesirable career choice[a]	2.63 (1.16)	2.13 (1.26)	.049*
Total	2.78 (0.65)[c]	2.80 (0.57)	.891

[a]Scores are reversed for items 2,3,5,7 & 9.
[b]p value < .05.
[c]p value is based on Mann Whitney U test.

Post-intervention and comparison with the pre-intervention

The results for the pre- and post-intervention groups showed statistically significant differences in Items 1, 2 and 8. There was increased agreement post-simulation to *Caring for older patients is usually challenging and rewarding* and to *Although caring for older patients is labor-intensive, it is worth the investment of time and energy*. The intervention group also scored significantly higher post-intervention for the item that described caring for older persons as frustrating. The mean total score pre- and post-intervention increased, but the difference was not statistically significant (Table 3).

No statistically significant difference was observed between the female and male students (Table 4). However, the sub-analysis revealed that among the female students, there was a significant positive increase in the item *Caring for older persons is challenging and rewarding* post-intervention. They also scored significantly more negatively for the item *It's frustrating to care for older patients*. In addition, more of them agreed to the items *Caring for older patients is intellectually stimulating* ($p = .055$) and

Table 3. Differences in pre and post PCOP-SF score in the intervention group.

Question, (range 0–4)	Pre, mean ($n = 471$)	Post, mean ($n = 464$)	p
(1) Caring for older patients is usually challenging and rewarding (sd)	2.88 (0.83)	3.07 (0.82)	.000**
(2) It´s frustrating caring for older patients[a] (sd)	2.71 (1.00)	2.52 (1.07)	.006*
(3) Caring for older patients is often unpleasant work[a] (sd)	3.14 (0.98)	3.10 (0.98)	.499
(4) Caring for older patients is intellectually stimulating (sd)	2.44 (0.94)	2.54 (0.95)	.056
(5) I would not choose to attend continuing education in nursing care of older patients[a] (sd)	2.25 (1.30)	2.31 (1.30)	.441
(6) Older patients are interesting to care for (sd)	2.76 (0.93)	2.84 (0.92)	.183
(7) Caring for older patients is less rewarding than caring for younger patients[a] (sd)	2.83 (1.08)	2.89 (1.09)	.310
(8) Although caring for older patients is labor intensive it is worth the investment of time and energy (sd)	3.09 (0.85)	3.19 (0.89)	.014*
(9) Caring for older patients is an undesirable career choice[a] (sd)	2.64 (1.15)	2.63 (1.16)	.982
Total	2.74 (0.62)	2.78 (0.65)	.263

[a]Scores are reversed for items 2,3,5,7 & 9.
*$p < .05$.
**$p < .001$.
p value is based on Mann Whitney U test.

Table 4. Differences in PCOP-SF pre and post score between men and women in the intervention group.

Question, (range 0–4)	Men pre ($n = 49$)	Women Pre ($n = 343$)	p	Men post ($n = 48$)	Women post ($n = 335$)	p	Men pre/post p	Women pre/post p
(1) Caring for older patients is usually challenging and rewarding (sd)	2.86 (0.84)	2.91 (0.84)	.688	3.15 (0.74)	3.06 (0.87)	.624	.062	.010*
(2) It´s frustrating caring for older patients[a] (sd)	2.76 (1.01)	2.74 (1.03)	.899	2.60 (1.05)	2.56 (1.08)	.761	.464	.031*
(3) Caring for older patients is often unpleasant work[a] (sd)	3.29 (0.82)	3.16 (1.00)	.665	2.98 (0.91)	3.17 (0.98)	.075	.057	.856
(4) Caring for older patients is intellectually stimulating (sd)	2.35 (1.15)	2.44 (0.95)	.676	2.52 (1.07)	2.56 (0.95)	.837	.481	.055
(5) I would not choose to attend continuing education in nursing care of older patients[a] (sd)	2.14 (1.44)	2.33 (1.25)	.428	2.41 (1.20)	2.37 (1.26)	.861	.404	.665
(6) Older patients are interesting to care for (sd)	2.78 (0.77)	2.76 (0.96)	.907	2.79 (0.99)	2.90 (0.89)	.582	.666	.054
(7) Caring for older patients is less rewarding than caring for younger patients[a] (sd)	2.69 (0.94)	2.92 (1.08)	.088	2.75 (1.08)	2.96 (1.08)	.141	.565	.612
(8) Although caring for older patients is labor intensive it is worth the investment of time and energy (sd)	3.16 (0.75)	3.15 (0.85)	.914	3.27 (0.87)	3.23 (0.90)	.835	.293	.071
(9) Caring for older patients is an undesirable career choice[a] (sd)	2.67 (1.05)	2.69 (1.15)	.861	2.55 (1.16)	2.68 (1.13)	.537	.650	.867
Total	2.74 (0.56)	2.78 (0.64)	.804	2.74 (0.68)	2.83 (0.64)	.550	.976	.312

[a]Scores are reversed for items 2,3,5,7 & 9.
*p value $< .05$.
p value is based on Mann Whitney U test.

Older patients are interesting to care for ($p = .054$). The sub-analysis of the responses of the male students did not unveil any significant result, but there was less agreement to the item *Caring for older patients is often unpleasant work* ($p = .057$) post-intervention. The additional sub-analysis of the mean scores revealed no significant difference, but the mean score of the male students did not increase post-intervention (2.74 pre-, 2.74 post-), whereas the mean score of the female students increased (2.78 pre-, 2.83 post-). Statistically significant differences were also seen based on the students' work experience (Table 5). The pre-intervention group with less work experience reported more statistically significant negative scores for the items *Caring for older patients is often unpleasant work* and *I would not choose to attend continuing education in nursing care of older patients*. The group with more experience

Table 5. Differences in PCOP-SF pre and post between no or <2 years of work experience and 2 or > years of work experience in the intervention group.

Question, (range 0–4)	Non + < 2 years pre (*n* = 193)	≥2 years pre (*n* = 200)	*p*	Non + < 2 years post (*n* = 185)	>2 years post (*n* = 187)	*p*	Non + < 2 years Pre/ post *p*	≥2 years Pre/ post *p*
(1) Caring for older patients is usually challenging and rewarding (sd)	2.95 (0.77)	2.86 (0.90)	.531	3.12 (0.78)	3.01 (0.90)	.298	.015*	.077
(2) It´s frustrating caring for older patients[a] (sd)	2.72 (0.98)	2.76 (1.07)	.539	2.48 (1.02)	2.65 (1.10)	.111	.022*	.330
(3) Caring for older patients is often unpleasant work[a] (sd)	3.09 (0.92)	3.25 (1.03)	.008*	3.06 (0.96)	3.23 (0.96)	.049*	.861	.581
(4) Caring for older patients is intellectually stimulating (sd)	2.42 (0.92)	2.44 (1.02)	.757	2.54 (0.91)	2.56 (1.02)	.643	.185	.187
(5) I would not choose to attend continuing education in nursing care of older patients[a] (sd)	2.09 (1.31)	2.51 (1.23)	.001*	2.15 (1.27)	2.58 (1.21)	.001*	.669	.571
(6) Older patients are interesting to care for (sd)	2.68 (0.92)	2.83 (0.95)	.095	2.84 (0.90)	2.01 (0.88)	.511	.068	.476
(7) Caring for older patients is less rewarding than caring for younger patients[a] (sd)	2.84 (1.09)	2.95 (1.04)	.327	2.96 (1.09)	2.93 (1.06)	.637	.210	.863
(8) Although caring for older patients is labor intensive it is worth the investment of time and energy (sd)	3.09 (0.85)	3.20 (0.81)	.206	3.25 (0.92)	3.22 (0.84)	.483	.018*	.684
(9) Caring for older patients is an undesirable career choice[a] (sd)	2.56 (1.16)	2.79 (1.11)	.067	2.58 (1.16)	2.78 (1.08)	.123	.914	.862
Total	2.71 (0.59)	2.84 (0.66)	.029*	2.78 (0.64)	2.86 (0.61)	.353	.198	.946

[a]Scores are reversed for items 2,3,5,7& 9.
*$p < .05$.
p value is based on Mann Whitney U test.

had a significantly higher mean score, which indicated more positive attitudes overall at the pre-intervention. The sub-analysis of the work experience groups revealed that the group with less experience had a significantly positive increase for the items *Caring for older patients is usually challenging and rewarding* and *Although caring for older patients is labor-intensive, it is worth the investment of time and energy*. The less experienced group also reported statistically more negative scores for the item *It's frustrating to care for older patients*, post-intervention. The group with more experience showed no statistically significant difference for any item pre- and post-intervention. The additional comparative sub-analyses of the mean scores pre- and post-intervention of the group with less experience and the group with more experience did not show a statistically significant difference. The mean scores of both groups increased, but the group with less experience had a higher increase (2.71 pre-, 2.78 post-) than the group with more experience (2.84 pre-, 2.86 post-).

Discussion

In another intervention study that also used an age suit, no difference was found between wearing a placebo clothing and wearing an age suit that simulated actual health problems (Cheng et al., 2020). Those results are in line with the conclusions in a recent review on age suit simulation (Gerhardy et al., 2022) that there is still a lack of controlled studies on the topic and that the results of the few studies conducted are inconclusive. The results of the current intervention study provided several insights into the effects of the use of an age simulation suit in SHC on nursing students' perspectives on providing care to older persons.

Interestingly, the intervention group found caring for older persons more frustrating than the control group after the intervention This finding can be viewed as a novel contribution to research in regard to the perspective of nursing students. Karvelytė et al. (2021) and Bearman et al. (2019) found that negative feelings, such as frustration, are common in simulation training from a patient

perspective. It would therefore be compelling to investigate if simulations from the patient perspective also affect perspectives on providing health care.

In this study the students in the control group were less motivated to continue their education on nursing care of older persons than those in the intervention group. Moreover, motivation to continue education in nursing of older persons was associated with more years in the work force. The association of work experience with positive attitudes toward older persons is also supported by the findings of Koskinen et al. (2022). Notably, however, this study also revealed that students with little or no work experience improved their scores significantly more than did the more experienced students. This indicate that the intervention had a stronger effect on the students with less experience. Kogan et al. (2016) describe that PCC offers a holistic perspective where a deep understanding of patient needs, which requires good communication skills, is crucial. Therefore, the concept of perspective taking is relevant in understanding the needs of older persons in health care provision. It would thus be interesting to further investigate age simulation and the influence of work experience in relation to perspectives on PCC and communication skills. Simulation as a teaching methodology can be important in preparing students for the complexity of caring for older persons (Bauchat et al., 2016). This preparation may not only be relevant for the students' clinical practice as graduated nurses but may also be valuable in their encounters with older persons during their education.

With regard to gender, there was no statistically significant difference between the male and female students in this study. However, the sub-analysis revealed that the female students increased their scores for *Caring for older persons is challenging and rewarding* even though they simultaneously scored high in the item where the job was described as frustrating. There were strong positive tendencies among the female students in the items that describing caring for older persons as intellectually stimulating and interesting. Previous studies indicated that gender differences in attitudes toward older persons seemed to vary. In one study, men were slightly more positive toward caring for older persons than were women (Dai et al., 2021), but another study showed that gender as well as age had no impact on willingness to work with older persons (Carlson & Idevall, 2015).

A number of reviews on age simulations (Coelho et al., 2017; Eost-Telling et al., 2021; Gerhardy et al., 2022; Karvelytė et al., 2021) showed several methodological differences among age suit simulation studies and that most of those studies measured empathy or attitudes. However, the specific context of the simulation was hardly considered and discussed or not at all. Yet, due to the mentioned transformation in health care, older persons will remain at home to a larger extent and will receive health care there – a setting in which the nurse is a key health professional. Context is important, as the home is not just a roof over the head but signifies comfort, security, recovery, freedom and peace (Gillsjö et al., 2011). As this study was conducted in a home environment in SHC, it added knowledge on the relevance of this scarcely evaluated environment.

This specific context in which SHC provides experience of common health problems associated with aging through the use of age suit simulations adds to the body of evidence that age suit simulation is a vital part of nurse education because it gives nursing students first-hand experience of aging and living with health problems, as demonstrated in a relevant context of health care: the home. From a pedagogical perspective, the simulations in SHC can be referred to as *experiential learning situations* or events outside everyday experience (Kolb & Kolb, 2018). Age suit simulation in SHC can be regarded as an innovative teaching model on gerontology and geriatric in undergraduate nurse education. The results of this study can be of interest not only from an educational perspective but also in the wider context of future nurses' provision of home healthcare and of other staff groups' conduct of health and social care, as well as for older persons receiving care and their next of kin. From a qualitative perspective, however, it would also be interesting to explore in depth, in future studies, nursing students' reflections on participating in age suit simulations. Moreover, as the context of the home was not the focus of this study, the relevance of a home environment would be interesting to follow up in future studies.

Strengths and limitations

Simulating health problems in young persons is a challenge. Thus, the choice of an appropriate age suit is important. Studies (Lauenroth et al., 2017; Vieweg & Schaefer, 2020) have shown that the GERT suit is a reasonable choice for simulating age-related health problems in young people in intervention studies. However, the possibility was recognized that the participants in this study wanted to present favorable answers, given the power imbalance in the teacher – student relationship.

All the students who were asked to participate in this study did so and provided almost all the requested data. However, individual-level data were not collected, and the demographic data of the participants in the pilot group were insufficient. It should also be noted that the inclusion of a control group was due to the COVID-19 restriction on-campus, as withdrawing students from parts of the normal program would have been unethical. Nevertheless, the addition of a control group further established the statistical significance of the effect of the intervention.

While the questionnaire had items in their original form and items that were translations, which could have affected their understandability, Swedish students are well educated in the English language, and the researchers were always present to clarify the questions. The internal consistency indicated by Cronbach's alpha in the present study was satisfactory (0.79). This value is lower than the original value of 0.85 (Burbank et al., 2018), but a recent validation of the PCOP-SF in the Chinese language had a lower Cronbach's alpha of 0.74 (Cheng et al., 2020). The item *Caring for older patients is usually challenging and rewarding* can be seen as a double-barreled item and could therefore be interpreted as both positive and negative. Despite this issue, the scale is validated (Burbank et al., 2018) and used in other studies and thus considered appropriate to use in the current study. Students were also given the opportunity to have the question items clarified by the researchers during the data collection. In addition, the author (BBS) ran a factor analysis which showed that the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was 0.85. Interestingly, frustration increased after the simulations. Unfortunately, this study cannot provide a reason for this outcome.

The PCOP-SF focuses on perspectives on caring for older persons, but it would have been interesting to explore how an additional scale, such as on the students' knowledge about older persons, could have complemented the results. For example, in a recent quantitative study, several questionnaires were used that elucidated that nursing students generally had moderately positive attitudes toward older persons but simultaneously expressed their low interest and motivation to work with such older persons. Social factors, such as previous experience with older persons and general attitudes toward older persons within a family, were highly associated with a more positive attitude (Guo et al., 2021). The decision to set the cutoff to two years for work experience for the lower end could have impacted the results, as it was not possible to compare those who had non-existent work experience to those with some or more extensive experience. The decision, however, was based on the assumption that most students would consider themselves to have at least some level of experience from their clinical training or part-time employments. For future studies, other control groups – for example, students from other universities and professions or single case studies could be considered.

Conclusion

The results of this study indicate that the intervention had a positive effect on the nursing students' attitudes to working with older persons. The total mean score of participants increased after the intervention but not significantly. However, statistically significant differences were noted in specific items, though the explanation for this was not within the scope of the study. The intervention group responded more positively to caring for older persons as a career choice than the control group. The scores for the items that described frustration with caring for older persons were higher in the intervention group post-intervention and when compared to the control group. There was no statistically significant difference between the male and female students, although the female students

responded significantly more negatively to some of the PCOP-SF items than did the male students. More years in the work force was associated with more positive attitudes to caring for older persons, but the students with less experience were more positively influenced by the intervention.

Implications

This study added to the empirical evidence that age suit simulation can be an effective tool for nurse education. The evidence presented herein pertains to the use of an age suit in the specific context of the home, which is an important milieu for future RNs' provision of health care to older persons. Age suit simulation was shown to be a unique way of creating an embodied learning experience by enabling nursing students to experience the same common health problems of older people as future care receivers would. Thus, age suit simulation has the potential to enable nursing students to understand better the aging body and living with common health problems, and to make them aware of their preconceived ideas about caring for older persons. Addressing nursing students' perspectives of, and attitudes to, caring for older persons is highly relevant during their education to improve their care of older persons in their clinical training and to prepare them for their future profession as an RN. Thus, age suit simulation can be seen as a supplement to theory that can help future RNs to better integrate a person-centered care approach into their professional skills.

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