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Cross-Sectional Study

A Cross-Sectional Study on Nurses' Attitudes Toward Old Age and Caring for Adults Aged Eighty Years and Older in Long-Term Care

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Abstract

Older individuals receiving long-term care, whether at home or in residential facilities, interact closely and continuously with nursing staff. As a result, nurses' perceptions and attitudes toward older adults play a crucial role in determining the quality of care provided. Despite this importance, there is a scarcity of research examining the attitudes of nurses working in long-term care toward elderly populations. This study aimed to assess the attitudes of Austrian nurses employed in long-term care settings (both residential and home care) toward adults aged 80 years and older, as well as their views on geriatric care. Additionally, the study explored how factors such as personal and professional experiences with older adults might influence these attitudes. In autumn 2023, a cross-sectional online survey was conducted, targeting a convenience sample of 875 Austrian nurses, including qualified nurses, specialised nurses, and those without formal diplomas. The survey incorporated three measurement tools: (1) the Aging Semantic Differential, which evaluates general attitudes toward older adults; (2) the Perspectives on Caring for Older People Scale; and (3) the Positive/Negative Contact Scales to assess experiences with older individuals. The results showed that nurses generally exhibited neutral to favorable attitudes toward adults aged 80 and above, as well as the care they receive. More positive attitudes were linked to frequent positive interactions and minimal negative experiences within their professional environment. Notably, nurses providing home care reported more positive interactions with care recipients. They held more favorable views toward adults aged 80 years and above compared to nurses working in residential care settings. The data suggest that fostering intergenerational contact may improve nurses' attitudes toward older adults receiving care. To strengthen positive perceptions, it is recommended that opportunities for constructive interactions between nurses and older care recipients be promoted, for instance, through the implementation of intergenerational educational interventions.

Keywords: Nurses, Ageism, Long-term care, Geriatric nursing, Residential facilities, Home care services

Introduction

Thanks to improvements in medicine, education, living standards, and access to healthcare, people today are living longer lives. This increase in life expectancy is contributing to a steady rise in the global population of older adults [1, 2].

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As the population ages, society will face challenges such as ensuring the provision of adequate healthcare. However, there are also benefits: older adults continue to play valuable roles in society, including participation in the workforce, volunteering, and supporting their families [2].

At some point during life, health conditions and the need for care inevitably arise [2]. By the age of 80 years, the likelihood of requiring care increases significantly, with roughly two-thirds of older adults needing assistance with daily activities [3, 4]. One of the key challenges of an ageing population is establishing and sustaining a care system capable of delivering high-quality, professional care to all older adults [2]. Providing quality care for older adults requires a comprehensive approach that addresses their full range of health needs. This goal can be achieved through an integrated care system, where all care and support services work together seamlessly to meet the needs of older adults [5].

The onset of care dependency, multiple chronic conditions, or frailty signals the start of what is known as the fourth age. This phase is defined not by chronological age but by the individual's health status and functional capacity [6]. Older adults who have previously been healthy and independent gradually transition from the third age into the fourth age, experiencing a growing need for care and medical support [7, 8]. This shift typically occurs between the ages of 80 and 85 years. As care needs rise, interventions such as integrated care services at home or within residential facilities become necessary to help older adults preserve their functional abilities, leading to an increased demand for long-term care [5]. Long-term care refers to the assistance and support provided to help an individual preserve their functional abilities and to ensure that people with or at risk of a significant ongoing loss of intrinsic capacity can maintain a level of functional ability consistent with their basic rights, fundamental freedoms, and human dignity [5]. Long-term care is characterized by a continuous or intermittent delivery of care over extended periods, which may be provided by family members or friends, professional caregivers, community services, or institutional staff [5]. This type of care encompasses both residential care and home care. The largest group of long-term care recipients consists of older adults aged 75 and above [9], with those aged 80 years and older having the most extensive and complex care needs [10].

When these individuals receive care at home or within residential facilities, nurses maintain close and ongoing contact with people in the fourth age. However, conflicts and challenges can emerge between nurses and these older adults, sometimes resulting in ageism directed toward the older care recipients. Ageism remains a significant concern within healthcare and nursing care settings [11, 12]. "Ageism in the nursing care of older adults is any kind of stereotype, prejudice, or discrimination against or to the benefit of older adult patients that is implicitly or explicitly practiced by the nurse and leads to actual or perceived (direct or indirect) decrease in the quality of health care provided" [13]. Because nurses regularly engage with older adults who are ill and dependent on care, they may develop prejudiced views throughout their careers, including negative or ageist attitudes [14–16]. Consequently, there is an increased chance that nurses will express unfavorable attitudes toward adults aged 80 years and older, or that these older individuals will experience ageism, as they are often stereotyped as frail and reliant on others [11, 17]. Studies reveal that frequent interactions perceived negatively with older adults, especially those receiving care, can influence nurses' perspectives and cause them to demonstrate subtle ageist behaviors [18, 19]. This phenomenon can be understood through the framework of Allport's contact hypothesis [20].

In the 1950s, Allport's contact hypothesis provided the initial framework for research aimed at reducing prejudice through interpersonal interaction, initially focusing on ethnic groups. Since then, this hypothesis has been applied to explore various types of prejudice [21, 22]. In studies on ageism, Allport's contact hypothesis is among several theories—such as social identity theory [23]—commonly utilized to explain the psychological processes that contribute to ageism [24]. Given that close interactions between nurses and older care recipients may influence whether older adults experience ageism, this hypothesis has also been employed to examine ageism within nursing [14, 18]. The contact hypothesis proposes that interpersonal contact can help lessen prejudice. Specifically, it suggests that prejudice between groups may decrease when social interactions occur under ideal conditions, which include equal status between groups, shared goals, cooperation between groups, and support from authorities, laws, or social norms. When attitudes toward an individual improve, this positivity tends to extend to the broader group (such as an age group) as well [20]. Although Allport [20] emphasized that reducing prejudice requires deeper, meaningful engagement, he also cautioned that "the more contact, the more trouble" [20]. This highlights the necessity for contact to occur under favorable and optimal conditions; otherwise, it might be perceived negatively and increase prejudice [20]. In contrast, nurses often do not experience such ideal conditions during their interactions with older adults, as they frequently care for those with high care needs. While Allport's contact hypothesis proposes that intergenerational contact can foster positive attitudes toward older adults, this may not hold for nurses, given that their encounters often happen under difficult circumstances [15]. This is especially relevant in long-term care settings, where nurses maintain close contact with older care recipients who represent the largest group of recipients and typically have the most complex care requirements [9, 10]. Additionally, nurses' interactions with older adults can be perceived either positively or negatively. Therefore, both professional and personal contacts may act as confounding factors influencing nurses' attitudes toward older adults, particularly considering the challenging nature of these interactions [19].

Building on Allport's contact hypothesis, Drury *et al.* [18] created the Positive and Negative Contact Scales (PNCS) to assess how nurses experience their interactions with older care recipients. Our study hypothesized that the nature of these contacts influences nurses' attitudes toward older adults as well as their views on geriatric care. Although some research highlights contact as an essential factor shaping attitudes toward older adults, there remains a lack of extensive, conclusive studies on this subject—especially within long-term care [14, 18, 25, 26]. Nurses' perceptions of older adults directly affect the quality of care delivered. Negative attitudes can diminish the level of care provided [15, 27], whereas positive attitudes help build trusting and comfortable relationships between nurses and those they care for [28]. Currently, research focused on nurses' attitudes toward older adults, particularly those aged 80 and over, within long-term care settings is sparse, and recent studies in both residential and home care contexts are limited [29]. Since care receivers maintain close contact with nurses, investigating these attitudes is essential for ensuring professional and high-quality care [15, 27, 30]. A review by Rush *et al.* [15] revealed inconsistent findings regarding whether nurses generally hold positive or negative attitudes toward caring for older people. To date, no research has compared nurses' attitudes across different long-term care environments, such as residential versus home care.

Promoting healthy aging and delivering integrated, best-practice care requires nurses to hold favorable attitudes toward older adults [2]. However, there is a clear gap in comprehensive research regarding nurses' views of older adults and their care in long-term care, as well as the impact of quality of contact on these attitudes. Accordingly, our study aimed to:

1. Evaluate Austrian long-term care nurses' attitudes toward adults aged 80 years and above and their perspectives on geriatric care;
2. Examine differences in nurses' attitudes toward adults aged 80 years and older between residential and home care settings; and
3. Identify which factors, particularly the quality of contact with care receivers aged 80 years and older, influence nurses' attitudes.

Materials and Methods

Study design

A cross-sectional online survey was conducted to explore the associations between variables [31]. The questionnaire was developed and administered via LimeSurvey 6.5 and distributed among nurses employed in Austrian long-term care institutions [32]. The study's reporting adhered to the STROBE (Strengthening the Reporting of Observational Studies in Epidemiology) guidelines specific to cross-sectional research [33].

Participants and setting

The study targeted Austrian nursing personnel, including diploma-holding nurses, those with bachelor's or master's degrees, specialised nurses, and nurses without diplomas, all working in long-term care. These professional groups were selected because of their direct involvement in caring for older adults who require assistance, resulting in frequent contact with this population. In Austria, nursing education involves a three-year training program that culminates in either a diploma or a bachelor's degree. Nurses may pursue specialisations such as intensive care or palliative care by completing an additional one-year university course. Nurses without diplomas, similar to assistant nurses or nursing aides, receive one to two years of training. Eligibility requires a minimum of one year of experience working with older adults within long-term care settings, including residential, home, and community care.

Sample size determination

Initial sample size requirements for residential and home care groups were calculated separately using Qualtrics' sample size calculator [34], based on population estimates provided by the Austrian government [35]. The residential care group required a minimum of 381 participants, and the home care group required 377 participants.

Sampling procedure

Convenience sampling was employed. Email lists from all Austrian federal states, covering residential care facilities, home care providers, and community nursing services, were utilized to contact nursing managers or designated representatives. These contacts received emails containing the study details and were asked to share the survey link with their nursing teams. An attachment with the invitation, study information, and a QR code for direct access to the online survey was included. The survey was also made available as a printed copy for display in workplaces. Follow-up reminder emails were sent one month after the initial contact was made. Data collection was conducted using LimeSurvey 6.5 [32] from October to November 2023.

Instrument

The questionnaire, designed during a previous investigation [19], required roughly ten minutes for completion. It included demographic items, the German adaptation of the Aging Semantic Differential scale (ASD) [36, 37]—which demonstrates strong reliability (Cronbach's $\alpha > 0.8$ [36])—and the German short form of the Perspectives on Caring for Older People scale (PCOP) [19, 38], with the English original showing a Cronbach's $\alpha < 0.8$ [38]. Additionally, it incorporated various potential influencing variables derived from literature, such as gender, length of experience in long-term care settings, specialized geriatric or gerontological training, and frequency of contact with older care recipients [18, 39–41].

The ASD yields total scores ranging from 26 to 182, where lower values correspond to more positive attitudes. Individual items are scored on a seven-point scale, where 1 indicates a positive perspective, 4 a neutral perspective, and 7 a negative perspective [36, 37]. The PCOP scale ranges from 9 to 36 points, with higher totals reflecting more favorable attitudes towards caring for older people. It consists of nine statements rated on a four-point Likert scale from 1 (strongly agree) to 4 (strongly disagree), measuring perceptions about caring for older people in need of assistance (e.g., "Caring for older patients is usually challenging and rewarding" and "I would not choose to attend continuing education in nursing care of older patients") [38]. For more comprehensive details on the questionnaire, refer to Lampersberger *et al.* [19].

For the current study, the Positive and Negative Contact Scales (PNCS) [18] were incorporated to evaluate how nurses perceive the quality of their interactions with older care receivers, considered a potential influencing factor. The PNCS comprises two components: the Positive Contact Scale (PCS) and the Negative Contact Scale (NCS), each measuring both the quality and frequency of contact. The PCS includes eight items: three assess the quality and five evaluate the frequency of positive interactions. The NCS has six items, evenly split between quality and frequency of negative interactions. Items are scored on a seven-point Likert scale, where the quality ratings range from 1 (none) to 7 (all), and frequency ratings range from 1 (never) to 7 (very often). To calculate scores ranging from 1 to 49, the mean quality and frequency scores are multiplied for each scale, adjusting for the different number of items. Higher PCS values indicate more frequent and higher-quality positive interactions with older care recipients, whereas higher NCS scores indicate more frequent and lower-quality negative interactions. Reliability coefficients (Cronbach's α) for both PCS and NCS were > 0.79 [18]. The original authors granted permission for translation and use of the scale.

Cross-cultural adaptation of the PNCS

The PNCS underwent cross-cultural adaptation following the four-step process outlined by Beaton *et al.* [42].

Phase 1: Two independent translators, both native German speakers—one with expertise in nursing science and knowledge of the measured concept—performed forward translations. A single author then synthesized these translations, which were sent back to the translators for validation.

Phase 2: The synthesized German version was back-translated into English by two translators whose native language was English. Neither translator was familiar with the measurement or its concepts, nor did they have a nursing background. One author also synthesized these back-translations.

Phase 3: An expert committee comprising the translators and a study author—consisting of language specialists, nurses, and nursing scientists—reviewed the translations. Upon reaching consensus, the pre-final version of the scales was sent to the original author of the scale for feedback, and no modifications were required.

Phase 4: To evaluate clarity and face validity, a pre-test was conducted with 17 nursing science master's students who were also practicing nurses. This convenience sample received email invitations to participate in the study. Examples of questions included: "Please evaluate whether the description and Likert scale items are understandable," and "If any labels or items were unclear, please specify what was confusing." No changes were made following this pre-test.

Internal reliability of the PNCS and PCOP

The PNCS includes the PCS Quality (Cronbach's $\alpha = 0.8$), PCS Frequency (Cronbach's $\alpha = 0.9$), NCS Quality (Cronbach's $\alpha = 0.8$), and NCS Frequency (Cronbach's $\alpha = 0.8$) subscales, all demonstrating good internal consistency with Cronbach's α values ≥ 0.8. When combining both PCS subscales and both NCS subscales, Cronbach's α remained ≥ 0.8. The PCOP demonstrated acceptable reliability, with a Cronbach's α of 0.7 [43].

Ethical considerations

The Medical University of Graz granted ethical approval for the study (EK Number 31–320 ex 18/19). Before starting the online survey, participants were required to read the study description and acknowledge the data privacy policy. The first survey question asked nurses whether they agreed to participate; answering "yes" constituted informed consent. Data collection was anonymous, with no personal identifiers recorded, and participant IP addresses were not stored.

Data analysis

The data were processed using IBM SPSS Statistics, version 28.0 [44]. Initially, questionnaires from participants who did not care for older adults were excluded. Additionally, those with over 40% missing responses were excluded [45], resulting in a total of 875 valid questionnaires (429 from residential care and 446 from home care). No techniques were applied to fill in missing data in these responses. Given the sample size, the data were assumed to be normally distributed [43]. To evaluate internal consistency, Cronbach's alpha coefficients were calculated for each scale within each care setting and across the entire long-term care cohort. Descriptive statistics summarized participant demographics and scores on the various scales. Continuous variables were described by their means and standard deviations, while categorical variables were presented as percentages. Differences between residential and home care groups were assessed using independent-samples t-tests, with Levene's test or Welch's F test applied as appropriate, and two-sided p-values reported. The association between the ASD and PCOP sum scores was examined via jittered scatterplots and Pearson correlation coefficients.

To identify predictors of nurses' attitudes, two multiple linear regression analyses were conducted. The first model used the PCOP sum score as the outcome variable, and the second model used the ASD sum score. Questionnaires with missing data were omitted from these analyses. Participants who indicated 'other' for the sex variable were excluded due to incomplete data, resulting in sex being treated as a binary variable (female/male). For categorical variables with more than two categories, dummy coding was applied. Initially, all candidate predictor variables listed in **Table 1** were entered into the models. Subsequently, variables that were not statistically significant and lacked theoretical justification were removed via backward elimination. However, variables representing nurses' contact with older adults and years of experience in long-term care were retained in all models to control for confounding effects **(Table 1)**. Variance inflation factors (VIF) were checked to ensure values remained below 10, thus ruling out multicollinearity issues [43]. The models met assumptions for linearity, error independence, homoscedasticity, normality of residuals, and absence of influential outliers. A significance threshold of $P \leq 0.05$ was applied.

Table 1. Predictor variables initially included in the multiple linear regression models

Variable	Category (1)	Reference category (0)
Sex	Female	Male
Age	Continuous variable	—
Origin	Non-Austrian	Austrian
Educational level	Academic	Non-academic
Profession (a)	Nursing staff without a diploma	Qualified nurse
	Specialised nurse	—
Years of experience in long-term care (b)	Continuous variable	—
Care setting	Home care	Residential care
Clinical focus	No	Yes
Geriatric or gerontological education	No	Yes
PCS (Positive Contact Scale) multiplied score	Continuous variable	—
NCS (Negative Contact Scale) multiplied score	Continuous variable	—
Frequency of interaction with persons needing care aged 80 and over (b)	Often	Occasionally
Ability to discuss personal topics (b)	Few or none	Many or all
Considering gender when responding to the ASD (a)	Female	No
	Male	—
	Other	—
Awareness of the meaning of ageism (a)	Unsure	Yes
	No	—

Notes: PCS = Positive Contact Scale, NCS = Negative Contact Scale, ASD = Aging Semantic Differential scale, PCOP = Perspectives on Caring for Older People scale, (a) Dummy variable, (b) Variables retained in both final models due to theoretical relevance

Results and Discussion

Characteristics of participants

Nurses working in long-term care had a mean age of 44.8 (± 9.9) years, with an average of 18.3 years of healthcare experience, specifically 13.9 years (± 8.9) in long-term care. Those in home care were, on average, older at 45.4 years (± 9.1), showing a statistically significant difference (P = 0.045) compared to nurses in residential care, whose average age was 44.1 years. However, residential care nurses demonstrated significantly longer experience within long-term care, averaging 13.9 years (± 8.9) versus 11.8 years (± 9) for home care nurses (P ≤ 0.001).
Across both groups, females constituted over 80% of participants, and just over half (51.7%) were qualified nurses. More than three-quarters of nurses in both settings reported daily interactions with care recipients aged 80 years and above. Additional details regarding participant demographics, work environments, frequency of contact with care receivers aged eighty years and older, and statistically significant contrasts between residential and home care nurses are available in **Table 2**.

Table 2. Participants' characteristics, working environment, and contact with care receivers ≥ 80 years of age in residential care, home care, and long-term care in total

Variable	Category	Residential care		Home care			Long-term care total	
		N	%	N	%	P	N	%
Sex		423		435		**≤ 0.001**	858	
	Female		84.4		82.0			88.2
	Male		15.6		7.8			11.7
	Other		0.0		0.02			0.1
Origin	Austrian	429	80.9	445	93	**≤ 0.001**	874	87.1
Education		428		445		**≤ 0.001**	873	
	Non-academic		80.1		89.2			84.8
	Academic		19.9		10.8			15.2
Profession		427		444		0.511	871	
	Qualified nurse		49.9		53.4			51.7
	Specialised nurse		11.5		36.9			10.5
	Nursing staff without a diploma		38.6		9.7			37.8
Clinical focus		429		445		**≤ 0.001**	874	
	Geriatrics		60.1		38.7			49.2
	Palliative care		11.9		3.1			7.4
	Psychiatry		1.9		1.1			1.5
	No focus		21		48.3			34.9
	Other		5.1		8.8			7
Geriatric/Gerontological education		429		444		**≤ 0.001**	873	
	No		48		39.6			54.3
	Yes		52		60.4			45.7
	Part of nursing programme[a]		38.1		42			39.8
	Stand-alone course[a]		81.6		82.4			82
	Postgraduate training[a]		12.6		6.3			9.8
	Others[a]		2.2		2.8			2.5
Contact with care-dependent individuals aged 80 years and above		429		446		**≤ 0.001**	875	
	Daily		85.8		76			80 8
	Occasionally		14.2		24			19.2
Presence of family		429		446		**0.007**	874	

members or friends aged 80 years and above	No	26.6	21.5		24
	Yes	73.4	78.5		76
	Can discuss many or all personal topics	64.9	56.6		60.5
	Can discuss few or no personal topics	35.1	43.4		39.5
		427	443	0.490	870
Considering a gender when responding to the ASD	No	80.8	81.3		81
	Female	14.8	16		15.3
	Male	2.1	1.6		1.8
	Other	2.3	1.1		1.7
		402	434	0.369	836
Awareness of the meaning of ageism	Yes	41.8	37.8		39.7
	No	35.6	36.2		35.9
	Unsure	22.6	26		24.4

ASD: Aging Semantic Differential scale; P-values ≤ 0.05 in bold; [a]: multiple responses possible

Nurses' attitudes towards adults aged eighty years and older and their care

According to the PNCS, nurses reported frequently having positive and meaningful interactions with individuals aged 80 and above. Negative encounters were infrequent and occurred rarely. The nurses generally expressed attitudes ranging from neutral to positive towards this age group and viewed the care provided to them favorably. Notably, nurses working in home care demonstrated significantly higher levels of positive contact and more favorable attitudes toward older adults compared to nurses working in other settings. **Table 3** summarizes the average scores on the PNCS, ASD, and PCOP scales, highlighting differences across care environments. The radar charts in Supplementary File 1 illustrate the average scores per item by scale and setting. These findings suggest that home care nurses experience more positive and fewer negative interactions with care recipients aged eighty years and older. Furthermore, no adjective pair on the ASD scale received negative ratings, and no observed differences were noted between care settings about the PCOP scores.

Table 3. Participants' quality of contact with care receivers, their attitudes towards older adults and geriatric care in residential care, home care, and long-term care in total

Scale	Residential care		Home care			Long-term care total	
	N	Mean score (SD)	N	Mean score (SD)	P	N	Mean score (SD)
PCS Quality	429	5.3 (0.9)	446	5.6 (0.8)	**≤ 0.001**	875	5.4 (0.9)
PCS Frequency	429	5.1 (1.2)	446	5.4 (1)	**≤ 0.001**	875	5.3 (1.1)
NCS Quality	429	2.6 (1.1)	446	2.3 (1)	**≤ 0.001**	875	2.4 (1)
NCS Frequency	428	2.4 (0.9)	446	2 (0.7)	**≤ 0.001**	874	2.2 (0.9)
PCS	429	27.7 (9.5)	446	30.7 (8.6)	**≤ 0.001**	875	29.2 (9.2)
NCS	428	6.9 (5)	446	4.8 (4)	**≤ 0.001**	874	5.9 (4.6)
ASD	428	3.7 (0.9)	443	3.6 (0.8)	**0.01**	871	3.7 (0.8)
ASD – Instrumentality	428	4 (0.9)	445	3.9 (0.9)	0.146	873	3.9 (0.9)
ASD – Autonomy	428	4 (1.1)	446	3.9 (0.9)	**0.025**	874	4.0 (1)
ASD—Acceptability	428	3.3 (1)	444	3.0 (0.9)	**≤ 0.001**	872	3.2 (1.0)
ASD—Integrity	428	3.7 (1.1)	445	3.7 (1.0)	0.371	873	3.7 (1.0)
PCOP	408	3.2 (0.4)	435	3.3 (0.4)	0.224	843	3.2 (0.4)

The PCS (Positive Contact Scale) measures the quality and frequency of contact on a scale from one to seven, where higher scores represent more positive contact. The overall PCS total sum score ranges from 1 to 48, with higher scores indicating greater positive contact. NCS (Negative Contact Scale) uses a mean score from one to seven, where lower scores correspond to more negative contact. The total sum score of the NCS ranges from 1 to 48, with lower scores reflecting more negative contact. ASD (Aging Semantic Differential scale) has a mean score between 1 and 7, where lower scores signify more positive attitudes toward older adults. PCOP (Perspectives on Caring for Older People) scores range from 1 to 4, with higher scores indicating more positive attitudes toward geriatric care. P-values ≤ 0.05 are highlighted in bold.

Relationship between the PCOP and the ASD

Figure 1 depicts the linear association between the total scores of the PCOP and the ASD. A Pearson correlation analysis revealed a moderate inverse relationship (r = -0.303; P ≤ 0.001), indicating a significant association between the PCOP and ASD.

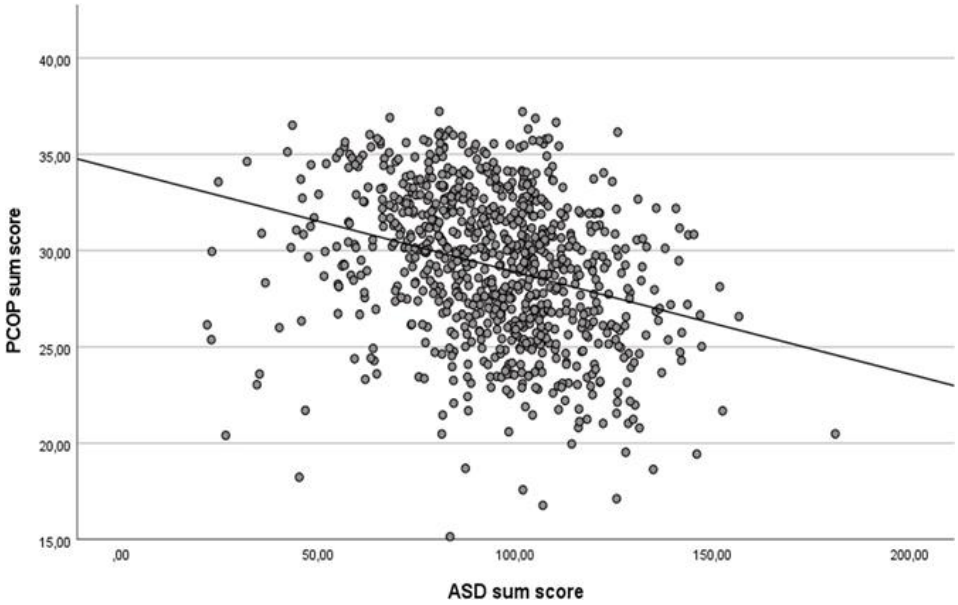


Figure 1. Scatterplot (jittered) of the linear relationship of the ASD and the PCOP. Notes: ASD = Aging Semantic Differential scale, PCOP = Perspectives on Caring for Older People scale

Multiple linear regression analyses were carried out using the PCOP and ASD scores as outcome variables. Both regression models revealed statistically significant findings (P ≤ 0.001). For the PCOP, six variables showed a significant positive relationship with nurses' attitudes toward caring for adults aged 80 years and older: (1) nationality being Austrian, (2) longer tenure in long-term care, (3) having a clinical work specialization, (4) experiencing positive contact with care receivers aged 80 years and above (PCS), (5) absence of negative contact perception (NCS), and (6) awareness of ageism. In terms of the ASD, four factors were significantly and positively associated with nurses' general attitudes: (1) perceiving positive contact with older care receivers (PCS), (2) lower negative contact scores (NCS), (3) maintaining a close personal bond with an older adult (frequent or consistent personal discussions), and (4) responding to the ASD without associating it with a specific gender, unlike those who envisioned a male figure. Detailed regression coefficients for all included variables are reported in **Tables 4 and 5**.

Table 4. Multiple linear regression models with the PCOP sum score as a dependent variable

	Independent variable	Category 1 (reference category 0)	B	95% CI for B		P-value
				LB	HB	
Dependent variable = PCOP sum score	Origin	Non-Austrian (Austrian)	-1.080	-1.899	-0.261	**0.010**
	Years working in long-term care	Continuous variable	0.053	0.025	0.080	**≤ 0.001**
	Clinical focus	No (yes)	-0.723	-1.257	-0.188	**0.008**
	PCS multiplied score	Continuous variable	0.187	0.155	0.219	**≤ 0.001**
	NCS multiplied score	Continuous variable	-0.134	-0.192	-0.076	**≤ 0.001**
	Interaction with person in need of care ≥ 80	Often (Occasionally)	0.199	-0.444	0.842	0.544
	Able to discuss personal topics	Few/no (Many/all)	-0.135	-0.670	0.400	0.620
	Knowing the meaning of ageism	No (yes)	-0.597	-1.184	-0.011	**0.046**
	Knowing the meaning of ageism (no)	Unsure (yes)	0.091	-0.559	0.741	0.784

B: unstandardised regression coefficient, CI: confidence interval, LB: lower bound, HB: higher bound, PCS: Positive Contact Scale, NCS: Negative Contact Scale, PCOP: Perspectives on Caring for Older People scale, P-values ≤ 0.05 in bold; n = 619; adjusted R^2 = 0.324; P ≤ 0.001

Table 5. Multiple linear regression models with the ASD sum score as a dependent variable

	Independent variable	Category 1 (reference category 0)	B	95% CI for B		P-value
				LB	HB	
Dependent variable = ASD sum score	Origin (non-Austrian)	Non-Austrian (Austrian)	3.594	-1.328	8.515	0.152
	Years working in long-term care	Continuous variable	-0.052	-0.221	0.116	0.543
	PCS multiplied score	Continuous variable	-0.650	-0.844	-0.457	**≤ 0.001**
	NCS multiplied score	Continuous variable	1.051	0.694	1.407	**≤ 0.001**
	Interaction with care recipients aged 80 years and older	Often (Occasionally)	-0.438	-4.428	3.552	0.829
	Having the ability to talk about personal matters	Few/no (Many/all)	3.743	0.437	7.050	**0.027**
	Considering gender when responding to the ASD	Female (No)	-4.216	-8.464	0.033	0.052
	Considering gender when responding to the ASD	Male (No)	-12.115	-22.336	-1.895	**0.020**
	Considering gender when responding to the ASD	Other (No)	1.243	-10.703	13.188	0.838

B: unstandardised regression coefficient, CI: confidence interval, LB: lower bound, HB: higher bound, PCS: Positive Contact Scale, NCS: Negative Contact Scale, ASD: Aging Semantic Differential scale, P-values ≤ 0.05 in bold; $n = 648$; *adjusted* $R^2 = 0.194$; P ≤ 0.001

This study explored three main objectives. The first was to evaluate Austrian nurses' attitudes toward adults aged 80 years and older, both generally and specifically regarding their care within long-term care environments. The second objective was to compare the attitudes of nurses working in residential care versus those in home care settings. The third aim focused on identifying factors that influence nurses' attitudes, particularly the quality of contact with care receivers aged 80 years and older.

Nurses employed in long-term care reported significantly more often than those in home care that they experienced positive contact with care receivers. Overall, attitudes toward adults aged 80 years and older ranged from neutral to positive, with nurses in home care expressing statistically more positive attitudes. The care of individuals aged 80 and older was generally viewed positively, and no significant difference in perception was found between care settings. Positive perceptions of contact with care receivers were linked to more favorable attitudes toward older adults in general and their care. Moreover, having a close personal relationship with an older family member or friend was positively related to nurses' overall attitudes. Longer professional experience in long-term care was also associated with more positive views regarding their care. The care setting itself did not have a significant impact on general attitudes or perceptions of care for adults aged 80 years and older.

Based on Allport's 1950 contact hypothesis [20], it was hypothesized that the quality of contact with older care receivers would affect nurses' attitudes toward these individuals and their care. The results confirmed that both a strong personal relationship with an older adult and positive contact experiences with older care receivers significantly influenced nurses' attitudes toward this population. Additionally, nurses' perceptions of care were shaped by positive contact experiences and extended work in long-term care. This aligns with Allport's contact hypothesis [20], which suggests that meaningful and positive interactions with older adults, whether in personal life or at work, can enhance attitudes and reduce prejudice. Supporting this, a study by Cadieux *et al.* [25] similarly found that younger adults with more contact with older people were less likely to stereotype them as incompetent. Since nurses have frequent and close interactions with frail and care-dependent older adults, they may develop biased attitudes, potentially holding more negative views toward older adults than the general public [14]. Thus, the findings of Cadieux *et al.* [25], which are based on the general population, may not be directly applicable to nurses working in healthcare environments. Nurses' perceptions of their contact experiences might differ because they often care for frail or dependent older adults [15], especially when challenges arise during care provision [26]. Moreover, these interactions may be influenced by demanding and stressful work conditions, including limited time and resources [46]. Supporting this, Drury *et al.* [18], applying Allport's contact hypothesis, confirmed that nurses' contact with older care recipients impacts their attitudes and experiences of ageism. Their findings indicated that positive contact had a greater effect on overt forms of ageism, while negative contact more strongly influenced subtle, less obvious forms. Similarly, Kusumastuti *et al.* [47] employed Allport's contact hypothesis to investigate medical students' attitudes toward older adults before and after clinical placements, concluding that the quality of contact plays a crucial role in shaping attitudes.

This research specifically examined explicit, other-directed ageism focused on stereotypes and prejudice [48, 49] using the ASD scale. According to this instrument, nurses' negative attitudes toward adults aged 80 years and older were more strongly influenced by negative contact experiences with older care recipients. Similar results were reported by Uğurlu *et al.* [26], who found that difficulties encountered in geriatric care heightened nurses' propensity for ageism. In contrast, positive contact experiences contributed to a more favorable view of geriatric care. These findings suggest that positive interactions with older care receivers could potentially increase nurses'

and nursing students' motivation to work in geriatric care. Conversely, Jang *et al.* [50] investigated whether the quality of their contact influenced nursing students' willingness to work with older adults; however, their results did not support this hypothesis. On the other hand, Rathnayake *et al.* [51] identified that intergenerational contact positively shaped nursing students' attitudes toward older adults, which in turn enhanced their willingness to work with this group. Additionally, a meta-analysis demonstrated that combining intergenerational contact with educational efforts leads to significant improvements in attitudes toward older adults [52].

To encourage intergenerational interactions, the WHO [53] has developed a comprehensive guide for designing intergenerational activities and educational programs. These initiatives aim to facilitate bonding between different age groups by focusing on topics relevant across generations, such as knowledge about ageing, creating age-friendly communities, gardening, and arts and crafts [53–55]. Furthermore, subjects related to nursing and caregiving—such as preferences regarding the provision or receipt of care and addressing ageism within healthcare—may also be incorporated. This approach is supported by Levy's Positive Education about Aging and Contact Experiences (PEACE) model [56], which promotes two key strategies to improve attitudes toward older adults: (1) educational programs including accurate information on ageing and positive role models, and (2) fostering positive contact experiences.

Furthermore, the University of Hong Kong, China, implemented an intergenerational participatory co-design project to address negative attitudes among students toward older adults [57]. This initiative was informed by the Optimal Quality Intergenerational Interaction Model, a framework designed to guide intergenerational contact programs in China [58]. The co-design method led to a notable improvement in students' attitudes toward older adults [57]. This strategy could also be applied to nurses working in long-term care.

Some evidence indicates that age stereotypes may exist among nurses [20, 59]. However, research specifically examining nurses' attitudes towards older adults in long-term care settings remains scarce. One study reported that assistant nurses held positive attitudes toward older adults [60], which aligns with the findings of this current study. Overall, studies on nurses' attitudes toward older adults have shown a wide range, from positive to negative [15]. Lampersberger *et al.* [19] previously assessed nurses' attitudes toward adults aged 80 years and older across various settings, although their sample primarily consisted of acute care nurses. Their results were comparable to those of this study, with nurses demonstrating generally neutral attitudes toward older adults and expressing positive views about caring for them [19].

Limitations

Despite the large number of participants in this study, there is a possibility that nursing managers and nurses with a particular interest in gerontology or care for older adults were more inclined to participate, due to the convenience sampling method applied. This may have resulted in more positive attitudes being reported. Using a non-representative convenience sampling approach introduces potential selection bias, which should be considered when interpreting the findings. Although random sampling would have minimized this risk, the absence of a complete list of possible participants prevented its implementation [31]. The study's design does not permit conclusions regarding causality; instead, it only allows identification of factors that may influence attitudes [31]. Furthermore, because no imputation method was used for missing data, some cases were excluded from the multiple linear regression analyses and scale assessments, which could have impacted the robustness of the models.

Implications

The findings of this study indicate that nurses working in long-term care generally hold neutral to positive attitudes toward adults aged 80 years and older, as well as towards their care. To promote further positive shifts in these attitudes, it is advisable to encourage more frequent experiences of positively perceived contact. One potential strategy to enhance such contact is the implementation of intergenerational education programs or activities, guided by the WHO [53] framework or through co-design initiatives based on the Optimal Quality Intergenerational Interaction Model. It is important to select activities or educational topics that are engaging for both age groups. Within nursing care, relevant subjects could include knowledge about ageing [54, 55] or training focused on ageism.

Further research is recommended to evaluate the effectiveness of the co-design approach within long-term care environments and the application of the Optimal Quality Intergenerational Interaction Model. Regarding educational interventions for nurses in long-term care, these results can be utilized to increase awareness of ageism in healthcare settings. To gain deeper insights into ageism in nursing care, additional studies employing quantitative approaches—such as cross-sectional research that includes ageism scales—as well as qualitative methods, like observational studies, are recommended.

For enhanced representativity and more robust findings, employing random sampling instead of convenience sampling is encouraged. This would also facilitate comparisons across different care settings, enabling the development of tailored interventions suited to various healthcare environments. To broaden understanding of

attitudes toward older adults and experiences of ageism, future research should explore how older adults perceive their interactions with nurses, using qualitative techniques such as interviews.
Moreover, randomized controlled trials are needed to assess nursing-specific intergenerational activities or educational programs in long-term care. Such studies would support the development of effective interventions benefiting both nurses and older adults as care recipients. Although the PNCS and PCOP scales have demonstrated internal reliability, additional psychometric evaluations—such as factor analyses—are recommended to validate the German versions of these instruments for use specifically in long-term care contexts.

Conclusion

A promising finding from this study is that nurses working in long-term care generally hold neutral to positive attitudes toward older adults and perceive their care positively. As longevity increases, the challenges in caring for older adults will grow, making it essential to foster a care and work environment that is experienced positively by both nurses and older adults. The introduction of intergenerational activities and educational programs may play a vital role in supporting the provision of sustainable, high-quality, and integrated care. To facilitate these intergenerational initiatives, frameworks such as the PEACE model or the WHO guide for designing intergenerational activities and education programs can be employed. Additionally, the findings of this study can inform educational interventions in long-term care settings, helping to raise awareness among nurses in Austria about current attitudes toward older adults and to address ageism. Such intergenerational contact has the potential to prevent or reduce ageism and, depending on the topics addressed, contribute positively to shaping the future of care.

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