Research Square

Preprints are preliminary reports that have not undergone peer review.
They should not be considered conclusive, used to inform clinical practice,
or referenced by the media as validated information.

Nursing students' willingness to work with older adults in relation to attitudes, experience, and geriatric education: a cross-sectional study

Grażyna Puto

grazyna.puto@uj.edu.pl

Jagiellonian University Medical College

Anna Kurowska

Jagiellonian University Medical College

Joanna Kiełbik

Jagiellonian University Medical College

Ewelina Czajak

Jagiellonian University Medical College

Patrycja Zurzycka

Jagiellonian University Medical College

Iwona Repka

Jagiellonian University Medical College

Research Article

Keywords: Students, Nursing, Geriatric Nursing, Attitude of Health Personnel

Posted Date: November 3rd, 2026

DOI: https://doi.org/10.21203/rs.3.rs-11579053/v1

License: This work is licensed under a Creative Commons Attribution 4.0 International License. Read Full License

Additional Declarations: No competing interests reported.

Abstract

Background

Population ageing is associated with increasing demand for healthcare services tailored to the complex needs of older adults. Understanding the factors associated with nursing students' willingness to work with this population may inform geriatric education planning. This study aimed to assess nursing students' willingness to work with older adults and identify associated factors.

Methods

This cross-sectional study included 235 nursing students. Associations with willingness were analysed in 228 participants, and regression analyses included 227 participants. Data were collected using a computer-assisted web interview (CAWI), a study-specific questionnaire, and the Attitudes Toward Seniors Scale (SPWS). Correlation analyses and hierarchical linear regression were performed. Statistical significance was set at $\alpha = 0.05$.

Results

Overall, 48.9% of students (n = 115) reported willingness to work with older adults. Greater willingness was associated with frequent and very frequent contact with people aged ≥ 65 years ($\beta = 0.21$; $p = 0.038$ and $\beta = 0.30$; $p = 0.009$, respectively), a perceived need to increase the number of educational hours ($\beta = 0.19$; $p = 0.006$), and respect and support ($\beta = 0.19$; $p = 0.009$). Lower willingness was associated with rejection and lack of understanding ($\beta = -0.18$; $p = 0.009$) and frequent contact with people aged ≥ 80 years ($\beta = -0.15$; $p = 0.042$). The model explained 25% of the variance, and including attitudes increased the explained variance by 9 percentage points ($\Delta R^2 = 0.09$; $p < 0.001$). In the subgroup of participants aged ≤ 25 years, the coefficient of determination (R^2) was 0.23.

Conclusions

Nursing students' willingness to work with older adults was associated with their attitudes towards this population, frequency of contact, and views on the need to change the number of teaching hours. Greater willingness was associated with respect and support, frequent and very frequent contact with people aged ≥ 65 years, and higher scores on the teaching-hours item, indicating responses favouring an increase. Lower willingness was associated with rejection and lack of understanding and frequent contact with people aged ≥ 80 years. These findings support incorporating activities that promote respect and support, encourage critical reflection on stereotypes, and enable contact with older adults with diverse functional abilities and care needs.

Background

Population ageing is associated with increasing demand for healthcare services tailored to the complex needs of older adults [1, 2]. Caring for this population presents particular challenges because of the co-occurrence of health, functional, and psychosocial problems associated with older age [1]. However, older adults are a highly heterogeneous population, and people of a similar age may differ substantially in health status, functional ability,

and independence in daily activities [1, 2]. Although these health, functional, and psychosocial problems may occur before the age of 65 years, their prevalence increases with age, particularly among those aged ≥ 80 years, highlighting the importance of care for this age group [1]. This variation in health and functional ability also underscores the need to avoid viewing older adults solely in terms of illness, loss of independence, and dependence on others [2, 3].

The growing demand for care for older adults makes appropriate preparation of future nurses increasingly important [4, 5]. Such preparation should extend beyond the acquisition of knowledge and clinical experience to include the development of attitudes and willingness to care for older adults. However, previous research indicates considerable variation in nursing students' willingness to work with this population [4–6]. In a systematic review and meta-analysis, Wang et al. found that approximately half of nursing students reported willingness to participate in caring for older adults [4]. An integrative review by Dai et al. indicated that willingness to work with older adults is multifactorial and may be associated with individual characteristics, previous experiences, and education [5]. Variation in willingness to care for older adults has also been documented in a multinational study of nursing students [6]. Attitudes towards older adults are an important correlate of willingness to work with this population [7, 8]. These attitudes may encompass acceptance, respect, and willingness to provide support, as well as social distance, stereotypical beliefs, and ageism [7, 9]. A review by Venables et al. showed that nursing students' attitudes towards older adults are associated with numerous factors, including previous experiences and aspects of their education [9]. The relevance of these attitudes extends beyond nursing students. A systematic review and meta-analysis by Vahedi et al. suggested that appropriately targeted educational interventions may improve medical students' attitudes towards older adults [8]. Perceptions of adults aged 80 years and older warrant particular attention, as studies involving health professions students have reported varied attitudes towards this age group [3]. Attitudes towards older adults may be associated with self-reported willingness to care for them. Tunç et al. identified empathy and ageist attitudes as predictors of nursing students' willingness to care for older adults. Their findings suggest that greater empathy and more positive attitudes may be associated with greater willingness to provide care, whereas stronger ageist attitudes may be associated with lower willingness [7]. Research on students' knowledge, attitudes, and behaviours regarding ageing also highlights the importance of addressing ageism in the education of future healthcare professionals [10].

Direct contact with older adults is another factor that may be relevant to willingness to work with this population [5 9, 11]. A study by Jang et al. among nursing students indicated that willingness to care for older adults may be associated with students' previous experiences [11]. The review by Venables et al. likewise emphasised the importance of contact experiences in shaping students' attitudes towards older adults [9]. Direct contact may provide opportunities to compare stereotypical views of ageing with the actual diversity of the older population. It may be particularly valuable to enable students to interact not only with patients who require substantial support but also with older adults who remain independent and active, thereby encouraging a more multidimensional understanding of ageing [3, 9]. Geriatric care education may also play an important role in shaping students' attitudes and willingness to work with older adults [12–16]. Hsu et al. found an association between gerontological education and students' attitudes towards older adults [12]. A systematic review by Yan et al. indicated that geriatric education programmes may improve nursing students' knowledge, shape their attitudes, and strengthen their intention to work with older adults [13]. Similarly, Tao et al. found that educational interventions may lead to changes in nursing students' knowledge, attitudes, or willingness to work with older adults, although effectiveness varies across interventions [14]. A meta-analysis by Martínez-Arnau et al.

confirmed that educational interventions among health and social sciences students can improve attitudes towards older adults [15]. A systematic review by Ross et al. also highlighted the importance of appropriately designed educational interventions in shaping health professions students' attitudes towards older adults [16].

Available evidence therefore suggests that students' willingness to work with older adults may be associated with multiple interrelated factors, particularly attitudes towards older adults, contact experiences, and educational preparation [5–7, 9, 11–16]. Assessing these factors simultaneously may provide a more comprehensive understanding of nursing students' willingness to work with this population. This study aimed to assess nursing students' willingness to work with older adults and identify associated factors, with particular emphasis on attitudes towards older adults, contact experiences, and selected aspects of education preparing students to work with this population.

Methods

Study design

A cross-sectional study was conducted to assess nursing students' willingness to work with older adults and their attitudes towards this population. This design enabled the identification of associations between the variables examined and areas requiring further investigation. The study was conducted in Poland between August 2024 and January 2025.

Data collection

Data were collected through a survey using a computer-assisted web interview (CAWI). This method allows a questionnaire to be distributed via an online link, preserves respondent anonymity, enables participants to complete the survey at a convenient time, and facilitates efficient data collection [17]. The survey link was shared with nursing students through social media and messaging platforms, including Facebook, Messenger, and WhatsApp. Completing the questionnaire took approximately 10–15 minutes. The form was configured so that submission was possible only after all questions had been answered. This study is reported in accordance with the STROBE guidelines for cross-sectional studies [18].

Participants and sampling

Participants included nursing students in Years 1–3 of a bachelor's degree programme or Years 1–2 of a master's degree programme. Eligibility criteria were enrolment in a nursing programme and provision of informed consent, which was required before accessing the survey. Students from other degree programmes and individuals who did not consent were excluded. The sample size was determined by the number of nursing students who voluntarily participated and met the inclusion criteria. Non-probability convenience sampling was used.

Measures

The questionnaire comprised three sections. The first collected sociodemographic information, including sex, age, relationship status, degree programme, and year of study. The second addressed employment, preparation for and willingness to work with older adults, including length of professional experience and willingness to

undertake such work, as well as contact with older adults. In this study, “older adults” refers to people aged ≥ 65 years, whereas “the oldest old” refers to those aged ≥ 80 years [19]. The third section comprised the Polish version of the Attitudes Toward Seniors Scale (SPWS) [20].

SPWS was developed on the basis of G. Miłkowska’s conceptualisation of social attitudes towards older adults and validated by Jacek Łukasiewicz and Wiesław Kowalski in 2021. It assesses attitudes towards older adults and identifies predominant beliefs and orientations concerning this population. The scale enables analysis of distinct attitudinal dimensions, which may help identify areas for educational activities that promote a positive view of ageing and intergenerational relationships. It comprises three subscales: (1) Respect and support: higher scores indicate more positive attitudes towards older adults, including recognition of their knowledge, experience, and social value, and willingness to show respect and provide support. (2) Rejection and lack of understanding: higher scores indicate stronger negative beliefs and stereotypes, including perceptions of older adults as passive, demanding, or poorly adapted, which may contribute to their marginalisation. (3) Social distance: higher scores reflect greater distance from older adults and weaker identification with their needs, which may manifest as limited willingness to establish closer relationships with them. Subscale scores are calculated by summing the scores for the relevant items and dividing the total by the number of items in that subscale. The resulting value is the mean subscale score. Higher scores indicate a greater intensity of the attitudinal component measured [20].

The internal consistency of the SPWS subscales was assessed using Cronbach’s alpha. The coefficients were $\alpha = 0.934$ for Respect and support, $\alpha = 0.892$ for Rejection and lack of understanding, and $\alpha = 0.782$ for Social distance.

Ethical considerations

Participation was voluntary, and anonymity and data confidentiality were assured. Before completing the survey, participants were provided with information about the study's aim the conditions of participation, and their right to discontinue participation at any time without consequences, including any effect on their education or grades. No incentives were offered. Informed consent was required before participants could access the questionnaire. The data collected did not permit identification of individual respondents and were used exclusively for research purposes. The study was conducted in accordance with the Declaration of Helsinki [21]. Approval was obtained from the Ethics Committee before data collection (approval no. 118.0043.1.257.2024, dated 2 August 2024).

Statistical analysis

Categorical variables were summarised as frequencies (N) and percentages (%). Descriptive statistics were calculated for quantitative variables; age was described using the mean and standard deviation (SD). Normality was assessed using the Kolmogorov–Smirnov test. Associations between willingness to work with older adults and the variables examined were assessed using Pearson’s correlation coefficient (r), for quantitative variables without outliers and variables measured on Likert scales, and Spearman’s rank correlation coefficient (rho). Pearson’s r was used to examine associations of willingness with attitudes towards older adults, views on the need to change the number of teaching hours, and perceived justification for increasing those hours. Spearman’s rho was used to assess associations with age, year of study, length of professional experience, and frequency of contact with older adults. Differences in willingness between two relationship-status groups were assessed using an independent-samples Student’s t-test. The Mann–Whitney U test was used to compare willingness between

two groups defined by contact with older adults. Hierarchical linear regression was performed to assess factors associated with willingness to work with older adults, with willingness as the dependent variable. Predictors were entered in two blocks. The coefficient of determination (R^2) and its change after the second block was entered (ΔR^2) were assessed. Regression analyses were also conducted in the subgroup aged ≤ 25 years. Statistical analyses were performed using IBM SPSS Statistics version 29. Statistical significance was set at $\alpha = 0.05$.

Post hoc statistical power analysis

The statistical power of the correlation analyses between willingness to work with older adults and Respect and support and Rejection and lack of understanding was at least 99%, compared with 27% for Social distance. For associations with sociodemographic and experience-related variables, power ranged from 14% to 44% for non-significant results and from 50% to 86% for statistically significant results. Power was 99% for the correlation between willingness and views on the need to change the number of teaching hours preparing students to work with older adults, and 33% for the correlation with perceived justification for increasing those hours. The power of the regression test exceeded 99%.

Results

Participant characteristics and preparation for and willingness to work with older adults

Of the 235 nursing students, 95.3% were women. The mean age was 23.31 years (SD = 6.28). Second-year bachelor's students constituted the largest group (35.3%). Professional nursing experience was reported by 36.6% of respondents. Students in years IV and V together accounted for 38.3% of the sample. Most participants (72.3%) considered the number of teaching hours devoted to geriatrics and geriatric care during their studies sufficient. Overall, 48.9% reported willingness to work with older adults: 35.7% answered "probably yes" and 13.2% "definitely yes". Unwillingness was reported by 40.9%, while 7.2% were undecided. A further 3.0% reported already working on a geriatric ward. Frequent or very frequent interactions mainly involved people aged ≥ 65 years; occasional contact with people aged ≥ 80 years was reported by 44.7% of respondents. Participants' sociodemographic characteristics, preparation for work, and contact experiences are presented in Table 1.

Table 1

Participants' sociodemographic characteristics, preparation for work, and contact with older adults

Variables		**N = 235 (%)**
Sex	Women	224 (95.3)
	Men	11 (4.7)
Age (years)	M (SD)	23.31 (6.28)
	Me (IQR)	22.00 (3.00)
	Min.–Max.	18–54
Relationship status a	Single	129 (54.9)
	In a relationship	106 (45.1)
Year of study	I	31 (13.2)
	II	83 (35.3)
	III	31 (13.2)
	I	55 (23.4)
	II	35 (14.9)
Employment in nursing	No	149 (63.4)
	Yes	86 (36.6)
Length of nursing experience b	≤ 6 months	27 (31.4)
	7–12 months	27 (31.4)
	13–24 months	15 (17.4)
	> 24 months	17 (19.8)
Contact with people aged ≥ 65 years	Never	0 (0.0)
	Occasionally	31 (13.2)
	Frequently	102 (43.4)
	Very frequently	102 (43.4)
Contact with people aged ≥ 80 years	Never	11 (4.7)
	Occasionally	105 (44.7)
	Frequently	73 (31.1)
	Very frequently	46 (19.6)

M – mean; Me – median; SD – standard deviation; IQR – interquartile range; Min. and Max. – minimum and maximum observed values; a for the analyses, marital status was grouped into two categories: unpartnered (single, divorced, or widowed) and partnered (in a non-marital relationship or married); b valid percentages (excluding missing responses) are reported for this question; c this response was treated as missing data in subsequent analyses.

Variables		N = 235 (%)
Contact with older adults at work b	No contact with older adults	8 (9.3)
	Yes, rarely	4 (4.7)
	Yes, occasionally	4 (4.7)
	Yes, frequently	13 (15.1)
	Yes, daily	57 (66.3)
Perceived need to change teaching hours preparing students to work with older adults	Should be substantially reduced	7 (3.0)
	Should be reduced	19 (8.1)
	Sufficient	170 (72.3)
	Should be slightly increased	21 (8.9)
	Should be increased	18 (7.7)
Perceived justification for increasing teaching hours preparing students to work with older adults	Definitely no	10 (4.3)
	Probably no	83 (35.3)
	Do not know	54 (23.0)
	Probably yes	70 (29.8)
	Definitely yes	18 (7.7)
Willingness to work with older adults	Definitely no	31 (13.2)
	Probably no	65 (27.7)
	Do not know	17 (7.2)
	Probably yes	84 (35.7)
	Definitely yes	31 (13.2)
	Already working on a geriatric ward c	7 (3.0)

M – mean; Me – median; SD – standard deviation; IQR – interquartile range; Min. and Max. – minimum and maximum observed values; for the analyses, marital status was grouped into two categories: unpartnered (single, divorced, or widowed) and partnered (in a non-marital relationship or married); valid percentages (excluding missing responses) are reported for this question; this response was treated as missing data in subsequent analyses.

Table 1

Attitudes towards older adults

Attitudes towards older adults were assessed using the SPWS. The mean score was 4.35 (SD = 0.67) for Respect and support, 3.73 (SD = 0.71) for Rejection and lack of understanding, and 2.27 (SD = 0.59) for Social distance. The Kolmogorov–Smirnov test was not statistically significant for Respect and support (p = 0.200), whereas the remaining variables showed statistically significant departures from normality. For all variables except age,

skewness ranged from − 2 to 2 and absolute kurtosis did not exceed 7 [22]. Age did not meet these criteria (skewness = 3.30; kurtosis = 11.28). Parametric methods were therefore used for variables meeting the specified criteria, while associations involving age and ordinal variables were examined using non-parametric methods. The results are presented in Table 2.

Table 2
Descriptive statistics and Kolmogorov–Smirnov test results

Variable	M	Me	SD	Skew.	Kurt.	Min.	Max.	D	p
Age	23.31	22.00	6.28	3.30	11.28	18.00	54.00	0.29	< 0.001
Perceived need to change teaching hours preparing students to work with older adults	3.10	3.00	0.77	0.46	2.19	1.00	5.00	0.39	< 0.001
Perceived justification for increasing teaching hours preparing students to work with older adults	3.01	3.00	1.06	0.15	-0.99	1.00	5.00	0.23	< 0.001
Willingness to work with older adults	3.08	4.00	1.32	-0.15	-1.32	1.00	5.00	0.26	< 0.001
SPWS									
Respect and support	4.35	4.37	0.67	-0.18	-0.17	2.37	5.80	0.03	0.200
Rejection and lack of understanding	3.73	3.74	0.71	-0.13	0.31	1.53	5.53	0.07	0.012
Social distance	2.27	2.18	0.59	0.82	1.25	1.09	4.55	0.08	< 0.001

M – mean; Me – median; SD – standard deviation; Skew. – skewness; Kurt. – kurtosis; Min. – minimum value; Max. – maximum value; D – Kolmogorov–Smirnov test statistic; p – p-value for the Kolmogorov–Smirnov test.

Table 2

Factors associated with willingness to work with older adults

Spearman's rank correlation analyses showed the following associations:

- Among the sociodemographic factors examined, year of study was positively correlated with willingness to work with older adults (rho = 0.13; p = 0.049). Students in later years of study reported greater willingness to work with this population.
- Among the contact-related factors, the frequency of contact with people aged ≥ 65 years was positively correlated with willingness to work with older adults (rho = 0.20; p = 0.002). More frequent contact was associated with greater willingness to work with this population.

No statistically significant associations were identified between willingness to work with older adults and the other sociodemographic factors, professional experience, or contact-related variables examined.

Pearson's correlation analyses identified the following associations with views on education and attitudes towards older adults:

- Scores on the item assessing the need to change the number of teaching hours preparing students to work with older adults were positively correlated with willingness ($r = 0.27$; $p < 0.001$). Higher scores, indicating a greater perceived need to increase teaching hours, were associated with greater willingness.
- Perceived justification for increasing teaching hours was not significantly associated with willingness to work with older adults ($r = 0.10$; $p = 0.128$).
- Respect and support was positively correlated with willingness to work with older adults ($r = 0.35$; $p < 0.001$).
- Rejection and lack of understanding was negatively correlated with willingness to work with older adults ($r = -0.27$; $p < 0.001$). Social distance was not significantly associated with willingness ($r = 0.09$; $p = 0.159$; Table 3).

Table 3

Correlations of sociodemographic factors, contact experiences, views on education, and attitudes towards older adults with willingness to work with this population (n = 228)

Variable	**Willingness to work with older adults**	
	Spearman's rho	**p**
Age	0.12	0.081
Year of study	0.13	0.049
Length of nursing experience*	0.07	0.543
Contact with older adults at work*	0.17	0.130
Contact with people aged ≥ 65 years	0.20	0.002
Contact with people aged ≥ 80 years	0.08	0.230
	Pearson's r	
Perceived need to change teaching hours preparing students to work with older adults	0.27	< 0.001
Perceived justification for increasing teaching hours preparing students to work with older adults	0.10	0.128
SPWS		
Respect and support	0.35	< 0.001
Rejection and lack of understanding	-0.27	< 0.001
Social distance	0.09	0.159

r — Pearson's correlation coefficient; rho — Spearman's rank correlation coefficient; p — p-value for the corresponding correlation coefficient; SPWS — Attitudes Toward Seniors Scale; $p < 0.05$. The analysis included 228 participants after excluding seven individuals working in a geriatric ward. *The sample size for length of employment and contact with older adults at work was n = 79, as these analyses included only employed participants.

Table 3

Predictors of willingness to work with older adults

Hierarchical linear regression was performed to identify factors associated with willingness to work with older adults. Sociodemographic variables, contact-related variables, and assessments of selected aspects of education were entered in the first block. The three dimensions of attitudes towards older adults were added in the second block.

Year of study and frequency of contact with older adults were dummy-coded in both models. The reference category was year I for year of study and no or occasional contact for contact frequency. Both models also included views on the need to change the number of teaching hours preparing students to work with older adults and a separate assessment of whether increasing those hours was justified. The first variable was coded from 1 to 5, ranging from a perceived need for a substantial reduction in hours to a perceived need for an increase. Higher scores therefore indicated a greater perceived need to increase teaching hours, rather than greater satisfaction with education.

One outlier was excluded from the analysis based on its Mahalanobis distance ($df = 14$; $p < 0.001$ threshold). The models were constructed hierarchically, initially including sociodemographic and experience-related variables, followed by attitudes towards older adults (Table 4).

Table 4

Hierarchical linear regression of factors associated with nursing students' willingness to work with older adults

Variables		Full sample (n = 227)					Participants aged ≤ 25 years (n = 201)				
		B	SE	β	t	p	B	SE	β	t	p
Model 1		F(11, 215) = 3.71; p < 0.001; R2 = 0.16					F(11, 189) = 3.27; p < 0.001 R2 = 0.16				
(Constant)		0.56	0.49		1.14	0.258	2.27	1.53		1.49	0.138
Age		0.24	0.28	0.06	0.86	0.388	-0.09	0.07	-0.12	-1.18	0.240
Year of study	II	0.32	0.27	0.12	1.21	0.226	0.42	0.27	0.16	1.58	0.117
	III	0.67	0.32	0.17	2.09	0.038	0.82	0.35	0.22	2.33	0.021
	IV	0.45	0.29	0.14	1.53	0.127	0.48	0.34	0.15	1.43	0.155
	V	0.32	0.33	0.08	0.97	0.332	0.49	0.42	0.12	1.17	0.245
Contact with people aged ≥ 65 years	Frequently	0.67	0.27	0.25	2.44	0.015	0.61	0.28	0.23	2.21	0.028
	Very frequently	0.99	0.32	0.37	3.13	0.002	0.82	0.32	0.31	2.52	0.013
Contact with people aged ≥ 80 years	Frequently	-0.39	0.21	-0.14	-1.84	0.068	-0.15	0.23	-0.05	-0.65	0.515
	Very frequently	-0.22	0.31	-0.06	-0.71	0.479	0.18	0.35	0.05	0.50	0.615
Perceived need to change teaching hours preparing students to work with older adults		0.42	0.12	0.24	3.43	< 0.001	0.56	0.14	0.29	4.06	< 0.001
Perceived justification for increasing teaching hours preparing students to work with older adults		0.01	0.09	0.01	0.16	0.872	-0.03	0.09	-0.02	-0.34	0.738
Model 2		F(14, 212) = 5.05; p < 0.001; R2 = 0.25					F(14, 186) = 3.92; p < 0.001; R2 = 0.23				
		ΔF(3, 212) = 8.54; p < 0.001; ΔR2 = 0.09					ΔF(3, 186) = 5.48; p = 0.001; ΔR2 = 0.07				
(Constant)		0.43	1.01		0.43	0.670	1.19	1.81		0.66	0.512
Age		0.26	0.27	0.06	0.96	0.337	-0.04	0.07	-0.06	-0.60	0.547

n – sample size included in the analysis (227 participants were included after excluding seven individuals working in a geriatric ward and one outlier); B – unstandardized regression coefficient; SE – standard error of B; β – standardized regression coefficient; t – t-test statistic; p – p-value; F – F-statistic for overall model significance; R^2 – coefficient of determination; ΔR^2 – increase in explained variance after adding predictors to the model; ΔF – F-change statistic; SPWS – Attitudes Toward Seniors Scale. The dependent variable was willingness to work with older adults. Model 1 included age, year of study, frequency of contact with individuals aged ≥ 65 and ≥ 80 years, and two variables reflecting opinions on the number of instructional hours. Model 2 additionally included three SPWS subscales. Analyses were performed for the full sample and the subgroup of participants aged ≤ 25 year

Variables		Full sample (n = 227)					Participants aged ≤ 25 years (n = 201)				
		B	SE	β	t	p	B	SE	β	t	p
Year of study	II	0.22	0.26	0.08	0.86	0.390	0.29	0.26	0.11	1.10	0.271
	III	0.48	0.32	0.12	1.52	0.131	0.56	0.35	0.15	1.61	0.110
	IV	0.34	0.28	0.11	1.22	0.225	0.32	0.33	0.10	0.96	0.337
	V	0.33	0.32	0.08	1.03	0.302	0.44	0.40	0.11	1.09	0.276
Contact with people aged ≥ 65 years	Frequently	0.55	0.26	0.21	2.08	0.038	0.51	0.27	0.20	1.90	0.059
	Very frequently	0.80	0.31	0.30	2.62	0.009	0.70	0.32	0.26	2.20	0.029
Contact with people aged ≥ 80 years	Frequently	-0.42	0.20	-0.15	-2.05	0.042	-0.24	0.22	-0.09	-1.08	0.282
	Very frequently	-0.11	0.30	-0.03	-0.37	0.716	0.17	0.34	0.05	0.49	0.625
Perceived need to change teaching hours preparing students to work with older adults		0.33	0.12	0.19	2.80	0.006	0.47	0.14	0.24	3.45	< 0.001
Perceived justification for increasing teaching hours preparing students to work with older adults		-0.04	0.08	-0.04	-0.52	0.605	-0.08	0.09	-0.06	-0.87	0.384
SPWS	Respect and support	0.37	0.14	0.19	2.63	0.009	0.33	0.15	0.17	2.25	0.026
	Rejection and lack of understanding	-0.33	0.13	-0.18	-2.63	0.009	-0.28	0.14	-0.15	-2.05	0.042
	Social distance	0.18	0.15	0.08	1.19	0.236	0.18	0.16	0.07	1.08	0.281

n – sample size included in the analysis (227 participants were included after excluding seven individuals working in a geriatric ward and one outlier); B – unstandardized regression coefficient; SE – standard error of B; β – standardized regression coefficient; t – t-test statistic; p – p-value; F – F-statistic for overall model significance; R^2 – coefficient of determination; ΔR^2 – increase in explained variance after adding predictors to the model; ΔF – F-change statistic; SPWS – Attitudes Toward Seniors Scale. The dependent variable was willingness to work with older adults. Model 1 included age, year of study, frequency of contact with individuals aged ≥ 65 and ≥ 80 years, and two variables reflecting opinions on the number of instructional hours. Model 2 additionally included three SPWS subscales. Analyses were performed for the full sample and the subgroup of participants aged ≤ 25 year

Table 4

In Model 1, significant factors associated with willingness to work with older adults were being in year III, frequent and very frequent contact with people aged ≥ 65 years, and views on the need to change teaching hours preparing students to work with older adults (B = 0.42; p < 0.001). Higher scores on the teaching-hours item were associated

with greater willingness. The separate assessment of whether increasing teaching hours was justified was not significantly associated with willingness (p = 0.872).

Attitudes towards older adults were added in Model 2. The model was statistically significant and explained 25% of the variance in willingness to work with older adults ($R^2 = 0.25$; $p < 0.001$). Adding attitudes increased the explained variance by 9 percentage points ($\Delta R^2 = 0.09$; $p < 0.001$). Significant predictors were frequent contact with people aged ≥ 80 years, frequent and very frequent contact with people aged ≥ 65 years, views on teaching hours preparing students to work with older adults, and the Respect and support and Rejection and lack of understanding dimensions.

Frequent contact with people aged ≥ 80 years was associated with a willingness score 0.42 points lower than that of participants reporting no or occasional contact with this age group, after adjustment for the other variables in the model. Frequent and very frequent contact with people aged ≥ 65 years were associated with willingness scores 0.55 and 0.80 points higher, respectively, than the reference category, after adjustment. Higher scores on the item assessing the need to change teaching hours were associated with greater willingness (B = 0.33; p = 0.006). A one-point increase in Respect and support was associated with a 0.37-point increase in willingness, whereas a one-point increase in Rejection and lack of understanding was associated with a 0.33-point decrease, after adjustment for the other variables. Among the significant predictors, very frequent contact with people aged ≥ 65 years had the largest absolute standardised regression coefficient (β = 0.30), followed by frequent contact with this age group (β = 0.21), Respect and support (β = 0.19), views on the need to change teaching hours (β = 0.19), Rejection and lack of understanding (β = −0.18), and frequent contact with people aged ≥ 80 years (β = −0.15). Regression analyses were also conducted among participants aged ≤ 25 years. In this subgroup, Model 1 was statistically significant and explained 16% of the variance in willingness ($R^2 = 0.16$; $p < 0.001$). Year III, frequent and very frequent contact with people aged ≥ 65 years, and views on the need to change teaching hours were again significantly and positively associated with willingness.

In the subgroup aged ≤ 25 years, Model 2 was statistically significant and explained 23% of the variance in willingness ($R^2 = 0.23$; $p < 0.001$). Adding attitudes towards older adults increased the explained variance by 7 percentage points ($\Delta R^2 = 0.07$; $p = 0.001$).

Significant predictors were very frequent contact with people aged ≥ 65 years, views on the need to change teaching hours preparing students to work with older adults, Respect and support, and Rejection and lack of understanding.

In this subgroup, very frequent contact with people aged ≥ 65 years was associated with a willingness score 0.70 points higher than the reference category. A one-point increase on the teaching-hours item was associated with a 0.47-point increase in willingness. A one-point increase in Respect and support was associated with a 0.33-point increase in willingness, whereas a one-point increase in Rejection and lack of understanding was associated with a 0.28-point decrease. All associations were adjusted for the other variables in the model.

Among significant predictors in participants aged ≤ 25 years, very frequent contact with people aged ≥ 65 years had the largest absolute standardised regression coefficient (β = 0.26), followed by views on the need to change teaching hours (β = 0.24), Respect and support (β = 0.17), and Rejection and lack of understanding (β = −0.15).

Discussion

This study assessed nursing students' willingness to work with older adults and identified associated factors, with particular emphasis on attitudes, contact experiences, and educational preparation during their studies. The findings indicate that willingness to work with older adults is multifactorial and is associated with students' experiences, attitudes, and perceptions of their educational preparation.

In this sample, 48.9% of students reported willingness to work with older adults, whereas 40.9% reported unwillingness. A further 7.2% were undecided, and 3.0% were already working on a geriatric ward. This finding is similar to the meta-analysis by Wang et al. [4], which included 68 studies and more than 30,000 nursing students and reported a pooled willingness to care for older adults of 49.0%. Those authors also found variation according to previous experiences with older adults and stage of education. Similarly, Dai et al. [5] and Cheng et al. [6] indicated that working with older adults is not among health professions students' most preferred career options. Despite growing demand for healthcare services for an ageing population, interest in working with older adults remains limited. A particularly relevant comparison is provided by Liu et al. [23], who reported an almost identical proportion willing to work with older adults, 48.67%, among 3,622 nursing students in China. This similarity, despite differences in cultural context and educational systems, supports the observation that interest in a geriatric care career remains moderate, encompassing approximately half of students.

This study found significant associations between attitudes towards older adults and willingness to work with this population. Greater Respect and support was associated with greater willingness, whereas greater Rejection and lack of understanding was associated with lower willingness. Social distance was not significantly associated with willingness. The relevance of attitudes was also evident in the multivariable analysis: Respect and support remained a positive predictor ($B = 0.37$; $\beta = 0.19$; $p = 0.009$), whereas Rejection and lack of understanding remained a negative predictor ($B = -0.33$; $\beta = -0.18$; $p = 0.009$). These findings are consistent with Cheng et al. [6], who highlighted the relevance of perceptions of ageing and older-adult care to students' willingness to pursue such work. Similarly, Tunç et al. [7] identified ageist attitudes and empathy as significant predictors of nursing students' willingness to care for older adults. The review by Venables et al. [9] further indicates that students' attitudes are shaped by contact experiences, knowledge of ageing, and gerontological education. The absence of a significant association with Social distance in our study may suggest that different attitudinal dimensions have different relevance to self-reported career preferences. Liu et al. [23] also found that more positive attitudes towards older adults were independently associated with stronger intentions to pursue a geriatric nursing career (OR = 1.012; 95% CI: 1.008–1.015; $p < 0.001$). Greater gerontological knowledge was another independent factor (OR = 1.205; 95% CI: 1.175–1.235; $p < 0.001$). These results are consistent with the importance of attitudes observed in our study, although the instruments and operational definitions of willingness differed.

Contact with older adults was another significant factor associated with willingness in our study. Frequency of contact with people aged ≥ 65 years was positively associated with willingness (rho = 0.20; $p = 0.002$). In the multivariable model, frequent contact remained a positive predictor ($B = 0.55$; $\beta = 0.21$; $p = 0.038$), while very frequent contact showed an even stronger association ($B = 0.80$; $\beta = 0.30$; $p = 0.009$) and was the strongest positive predictor in the final model. The relevance of previous experiences is supported by Wang et al.'s meta-analysis [4], in which greater willingness was observed among students with experience of living with or caring for an older adult. However, Jang et al. [11] suggested that the quality of contact may be particularly important, beyond its frequency. Regular, positively perceived contact may improve understanding of older adults' needs, increase perceived competence, and reduce stereotypical beliefs. In Liu et al.'s study [23], both informal

intergenerational experiences and more formal types of contact were independently associated with intentions to work with older adults. These included good relationships with older adults (OR = 1.557), co-residence (OR = 1.286), having been cared for by grandparents during childhood (OR = 1.356), volunteering with older adults (OR = 1.488), and experience of working in a nursing home (OR = 1.487). These findings further suggest that the relevance of contact extends beyond frequency to the nature and context of relationships.

A different pattern emerged for contact with people aged ≥ 80 years. Although the correlation analysis showed no significant association with willingness, frequent contact with this age group was negatively associated with willingness in the multivariable model (B = − 0.42; β = −0.15; p = 0.042). This finding requires caution because the association emerged only after adjustment for other variables and should not be interpreted as evidence that contact with the oldest old is itself detrimental. Schüttengruber et al. [3] found that attitudes towards people aged 80 years and older varied across dimensions and that knowledge of ageism and personal contact were associated with more positive attitudes. The relevance of contact may therefore depend on its nature, quality, and context, as well as its frequency. Clinical contact with the oldest old may more often involve patients with multimorbidity, dependence, and cognitive impairment, potentially shaping a different view of ageing from contact with independent and active older adults. However, this interpretation remains hypothetical and requires further investigation.

We also found a weak positive association between year of study and willingness to work with older adults (rho = 0.13; p = 0.049). In the first regression model, third-year students reported greater willingness than first-year students (B = 0.67; p = 0.038), but this association did not persist after attitudes were included. This finding partly corresponds with Wang et al.'s meta-analysis [4], in which willingness was more prevalent among students in later years of study. Venables et al. [9] also suggested that stage of education may be associated with attitudes towards older adults. Hsu et al. [12] found that positive experiences in both geriatric nursing courses and clinical practice with older adults were associated with more positive attitudes. Hammad et al. [10] additionally emphasised satisfaction with education and confidence in caring for older adults. Year of study may therefore reflect not only educational stage but also accumulated educational and clinical experiences. In contrast, Liu et al. [23] found that an earlier year of study was associated with stronger intentions to work with older adults (OR = 0.735; 95% CI: 0.663–0.815; p < 0.001). They suggested that students may become interested in other specialties as their education progresses and clinical exposure broadens. This difference from our findings may reflect variation in educational systems, study populations, and clinical placement organisation, indicating that year of study should not be regarded as a universal predictor of willingness to work with older adults.

Most respondents (72.3%) considered the teaching hours devoted to geriatrics and geriatric care sufficient. Nevertheless, higher scores on the item assessing the need to change teaching hours were associated with greater willingness in the multivariable model (B = 0.33; β = 0.19; p = 0.006), whereas the separate assessment of whether increasing teaching hours was justified was not a significant predictor. These findings suggest that educational preparation should not be considered solely in terms of teaching hours. Yan et al. [13] found that geriatric education can benefit students' knowledge, attitudes, and career intentions, particularly when a dedicated course is combined with clinical practice. Tao et al. [14] reported the effectiveness of diverse educational strategies, including didactic content, simulation, immersive experiences, and clinical practice. The meta-analysis by Martínez-Arnau et al. [15] showed benefits from interventions that develop empathy and combine knowledge with clinical skills. Ross et al. [16] reached similar conclusions. Thus, the quality, scope, and practical nature of education may be important alongside the number of teaching hours. Liu et al. [23] also

supported the relevance of education: both a perceived need for specialist geriatric nursing courses (OR = 1.339; 95% CI: 1.093–1.641; p = 0.005) and actual participation in geriatric education (OR = 1.202; 95% CI: 1.030–1.403; p = 0.019) were independently associated with stronger intentions to pursue this career. Together with our findings, this suggests that geriatric education may be relevant not only through its duration but also through targeted content and practical experiences.

The hierarchical regression analysis supported the multifactorial nature of willingness to work with older adults. The model incorporating sociodemographic characteristics, contact experiences, and education-related variables explained 16% of the variance in willingness. Adding attitudes towards older adults increased this proportion to 25%, a statistically significant increase of 9 percentage points. This additional explained variance highlights the contribution of attitudes beyond experience and formal educational preparation. The finding is consistent with Tunç et al. [7], who identified attitudes and empathy as significant predictors of willingness to care for older adults. More broadly, Vahedi et al. [8] also support the relevance of future healthcare professionals' attitudes towards older adults.

The logistic regression model reported by Liu et al. [23] had a Nagelkerke pseudo-R^2 of 0.213, numerically close to the coefficient of determination of our final model (R^2 = 0.25). However, direct comparison is not justified because these measures have different interpretations, the studies used different regression models, and the dependent variables were operationalised differently. Nevertheless, both studies indicate that the factors included in their models account for only part of the variation in career intentions or willingness to work with older adults, consistent with the multifactorial nature of these constructs.

Our findings indicate that students' willingness to work with older adults is associated with educational preparation, direct contact experiences, and attitudes towards this population. Health professions education may therefore benefit from integrating geriatric knowledge with practical experience and activities that develop empathy and positive attitudes towards older adults [12–16]. Enabling contact with a diverse older population, including both patients requiring intensive support and older adults who remain independent and active, may be particularly valuable. Such contact may encourage a more multidimensional understanding of ageing and reduce age-related stereotypes [3, 9, 11, 16].

Limitations

One limitation of this study is its cross-sectional design which enabled identification of associations but did not allow their direction to be established or causal inferences to be drawn. It is therefore unclear whether more frequent contact increases willingness to work with older adults or whether greater willingness encourages more frequent contact. Future research should use longitudinal designs and pretest–posttest intervention studies to assess changes in students' attitudes and willingness during geriatric education. Another limitation is that the study was conducted at a single academic centre potentially limiting sample representativeness and generalisability to the wider population of health professions students. Future studies should recruit participants from multiple universities and use random or stratified sampling to improve representativeness and external validity. Multicentre studies could also provide a more comprehensive understanding of willingness and attitudes at different stages of health professions education. Finally, the exclusive use of quantitative methods limits in-depth understanding of the factors underlying students' attitudes and willingness. Future research should consider mixed-methods approaches. Individual interviews or focus groups could provide deeper insights into

students’ experiences, motivations, attitudes towards older adults, and preferences regarding future work with this population.

A strength of this study is its multidimensional assessment of nursing students' attitudes towards older adults and their willingness to work with this population. The SPWS enabled distinct attitudinal dimensions and their associations with self-reported willingness to be assessed. Hierarchical linear regression quantified the additional contribution of attitudes after accounting for the other factors examined. The analysis among students aged ≤ 25 years was another strength, allowing assessment of the consistency of associations in a more age-homogeneous group. Distinguishing contact with people aged ≥ 65 years from contact with those aged ≥ 80 years also enabled a more detailed assessment of how these experiences relate to willingness. These findings may inform the planning and further evaluation of educational activities preparing students to care for older adults.

Conclusions

Nursing students’ willingness to work with older adults was associated with attitudes towards this population, frequency of contact, and a perceived need to increase teaching hours. Greater willingness was associated with higher scores on the Respect and Support dimension and frequent or very frequent contact with people aged ≥ 65 years. In contrast, lower willingness was associated with higher scores on the Rejection and Lack of Understanding dimension and frequent contact with people aged ≥ 80 years. Nursing education should incorporate activities that foster respect and support, encourage critical reflection on age-related stereotypes, and facilitate contact with older adults with diverse functional abilities and care needs.

Abbreviations

SPWS
Attitudes Toward Seniors Scale
CAWI
Computer—assisted web interview

Declarations

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Author contributions

GP, ECz: Conceptualization, Data curation, Formal analysis, Methodology, Validation, Visualization, Writing – original draft, Writing – review & editing, Funding acquisition.

AK: Data curation, Formal analysis, Methodology, Validation, Visualization, Writing – original draft, Writing – review & editing, Funding acquisition, Project administration, Supervision.

IR, PZ, JK: Formal analysis, Writing – review & editing, Supervision.

Ethics approval and consent to participate

The study was conducted in accordance with the Declaration of Helsinki. Approval was obtained from the Ethics Committee before data collection (approval no. 118.0043.1.257.2024, dated 2 August 2024). Electronic informed consent was obtained from all participants before they accessed the survey.

Consent for publication

Not applicable.

Availability of data and materials

The datasets generated and/or analyzed during the current study are available from the corresponding author on reasonable request.

Competing interests

The authors declare no competing interests.

References

1. World Health Organization. World report on ageing and health. Geneva: World Health Organization. 2015. ISBN: 978-92-4-156504-2.
2. Eurostat. Demography of Europe – 2026 edition. Luxembourg: European Commission. 2026. https://ec.europa.eu/eurostat/web/interactive-publications/demography-2026. Accessed 8 Sep 2026.
3. Schüttengruber G, Stolz E, Lohrmann C, Kriebernegg U, Halfens R, Großschädl F. Attitudes towards older adults (80 years and older): a measurement with the ageing semantic differential – a cross-sectional study of Austrian students. Int J Older People Nurs. 2022;17:e12430. 10.1111/opn.12430.
4. Wang Y, Lv F, Zeng H, Wang J. Approximately half of the nursing students confirmed their willingness to participate in caring for older people: a systematic review and meta-analysis. BMC Geriatr. 2024;24:745. 10.1186/s12877-024-05321-6.
5. Dai F, Liu Y, Ju M, Yang Y. Nursing students' willingness to work in geriatric care: an integrative review. Nurs Open. 2021;8(5):2061–77. 10.1002/nop2.726.
6. Cheng HL, Lam SC, Cruz JP, Almazan JU, Machuca-Contreras FA, Cecily HSJ, et al. Willingness to care for older people and associated factors in pre-registered student nurses: a multi-country survey study. Nurse Educ Today. 2022;110:105279. 10.1016/j.nedt.2022.105279.
7. Tunç AM, Gökçay G, Çevirme A. Predictive roles of empathy and ageism attitudes in nursing students' willingness to care for older adults. BMC Nurs. 2026;25:391. 10.1186/s12912-026-04536-9.
8. Vahedi A, Andersson ÅG, Fure B. Medical students' attitudes towards older persons – a systematic review and meta-analysis. Med Educ Online. 2026;31(1):2661455. 10.1080/10872981.2026.2661455.
9. Venables H, Wells Y, Fetherstonhaugh D, Wallace H. Factors associated with nursing students' attitudes toward older people: a scoping review. Gerontol Geriatr Educ. 2023;44(1):131–50. 10.1080/02701960.2021.2012466.
10. Hammad BM, Salameh B, Eqtait FA, Maysa K, Fashafsheh IH, Ayed AJ, et al. Nursing students' knowledge, attitudes, and behaviors toward aging and ageism in Palestine. BMC Geriatr. 2025;25(1):296. 10.1186/s12877-025-05946-1.

11. Jang I, Oh D, Kim YS. Factors associated with nursing students' willingness to care for older adults in Korea and the United States. Int J Nurs Sci. 2019;6(4):426–31. 10.1016/j.ijnss.2019.09.004.
12. Hsu MHK, Ling MH, Lui TL. Relationship between gerontological nursing education and attitude toward older people. Nurse Educ Today. 2019;74:85–90. 10.1016/j.nedt.2018.12.007.
13. Yan Z, Chang HCR, Montayre J, Ho MH. How does geriatric nursing education program change the knowledge, attitude and working intention among undergraduate nursing students? A systematic literature review. Nurse Educ Today. 2022;108:105161. 10.1016/j.nedt.2021.105161.
14. Tao X, MacAndrew M, Dahlke S, Butler JI, Rayner J, Fetherstonhaugh D, et al. Educational interventions to improve student nurses' knowledge, attitudes, or willingness to work with older people: a systematic review of quantitative findings. Int J Nurs Educ Scholarsh. 2024;21(1):20230110. 10.1515/ijnes-2023-0110.
15. Martínez-Arnau FM, López-Hernández L, Castellano-Rioja E, Botella-Navas M, Pérez-Ros P. Interventions to improve attitudes toward older people in undergraduate health and social sciences students: a systematic review and meta-analysis. Nurse Educ Today. 2022;110:105269. 10.1016/j.nedt.2022.105269.
16. Ross L, Jennings P, Williams B. Improving health care student attitudes toward older adults through educational interventions: a systematic review. Gerontol Geriatr Educ. 2018;39(2):193–213. 10.1080/02701960.2016.1267641.
17. SurvGo. Metodologia. https://www.survgo.com/blog/metodologia. Accessed 19 Feb 2025.
18. von Elm E, Altman DG, Egger M, Pocock SJ, Gøtzsche PC, Vandenbroucke JP. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement: guidelines for reporting observational studies. PLoS Med. 2007;4(10):e296. 10.1371/journal.pmed.0040296.
19. World Health Organization, Regional Office for the Western Pacific. Regional framework for action on ageing and health in the Western Pacific (2014–2019). Manila: World Health Organization; 2014. p. 33.
20. Łukasiewicz J, Kowalski W. Skala Postaw Wobec Seniorów (SPWS). Prezentacja narzędzia. Przegląd Psychologiczny. 2021;64(3):81–101. 10.31648/pp.7332.
21. World Medical Association. World Medical Association Declaration of Helsinki: ethical principles for medical research involving human participants. JAMA. 2025;333(1):71–4. 10.1001/jama.2024.21972.
22. Watkins MW. A step-by-step guide to exploratory factor analysis with SPSS. New York: Routledge; 2021.
23. Liu L, Zeng X, Tang P, Qi K, Wang P. Factors influencing vocational nursing students' career intentions in geriatric nursing: a cross-sectional study. BMC Nurs. 2026;25:167. 10.1186/s12912-026-04346-z.