

# Does Ageism Exist Among Multidisciplinary Rehabilitation Students? Predictors of Attitudes Toward Older Adults

Maha Almarwani 

Rehabilitation Sciences Department, College of Applied Medical Sciences, King Saud University, Riyadh, Saudi Arabia

Correspondence: Maha Almarwani, Rehabilitation Sciences Department, College of Applied Medical Sciences, King Saud University, Riyadh, 11433, Kingdom of Saudi Arabia, Email [malmarwani@ksu.edu.sa](mailto:malmarwani@ksu.edu.sa)

**Background:** With the growing population of older adults, the demand for health rehabilitation services has rapidly increased. Like many countries around the world, the older population in Saudi Arabia is increasing. Tackling ageism has powerful provenance for uncovering and changing the dynamics of contemporary aging in Saudi Arabia. This study examined the attitudes toward older adults and the potential predictors influencing these attitudes among multidisciplinary health rehabilitation students.

**Methods:** A total of 293 health rehabilitation students completed an online survey with a mean age of  $21.1 \pm 1.3$  years. The survey included data about demographic and geriatric-related characteristics, attitudes toward older adults (UCLA-GA), knowledge of aging (FAQ) and aging anxiety (AAS).

**Results:** Most participants were female (70.3%), with 53% of the students specializing in physical therapy. The average score of attitudes toward older adults was 3.43 (0.40). The predictors of attitudes toward older adults were knowledge of aging ( $\beta = 0.34, p < 0.0001$ ), living with older adults ( $\beta = 0.12, p = 0.02$ ) and the importance of contact (very important,  $\beta = 0.31, p = 0.04$ ).

**Conclusion:** These results provide further evidence to support that ageist attitudes among students can be overcome by enhancing knowledge of aging and promoting positive contact with older adults. With the demographic shift in Saudi Arabia, we propose that there is a great need for establishing a competency-based geriatric education and strategies to enhance positive contact with older adults.

**Keywords:** ageism, aging anxiety, attitudes toward aging, contact with older adults, health rehabilitation, knowledge of aging

## Introduction

The global population of older adults is predicted to reach two billion by 2050.<sup>1</sup> Like many countries around the world, the older population in Saudi Arabia is increasing. The proportion of Saudi people aged 65 years and older is expected to be almost 18.4% of the total population of 40 million by 2050.<sup>1</sup> Saudi Arabia is presently approaching unmapped terrain in terms of the proportion of its older population and the needs of this population. The major shift in Saudi Arabia's age structure is a result of declining fertility rates and increasing life expectancy.<sup>1,2</sup>

As the aging population is an inevitable demographic change worldwide, many studies have shown that older adults are more vulnerable to chronic diseases and disabilities.<sup>3-5</sup> However, aging has detrimental effects beyond just health-related issues. Older adults also have to deal with other social and personal consequences such as loneliness, increased anxiety, and ageism.<sup>6-9</sup> Ageism has been defined as "a multidimensional concept referring to beliefs (stereotypes), emotions (prejudice), and behaviors and attitudes (discrimination) associated with the age of a person or group of people".<sup>6</sup> Ageism is the most common form of perceived discrimination against older adults across many cultures in both Western and Eastern countries.<sup>10-16</sup>

Ageism has been well-documented to have negative physical, psychological, and cognitive outcomes in older adults.<sup>7,17</sup> Allen et al 2022 argued that repeated exposure to ageism has the same cumulative effect on body deterioration,

physical aging, and associated health problems as racial and ethnic health disparities.<sup>14</sup> Despite the adverse health outcomes of ageism, several studies have determined that ageism is highly prevalent among healthcare professionals, which can affect the quality of healthcare older adults receive.<sup>9,18,19</sup>

In parallel with the pervasive culture of ageism, many studies have investigated the associations between attitudes toward older adults and sociodemographic and geriatric-related factors, including age, gender, year of education, living experience with older relatives, prior geriatric caring experience, knowledge and training in geriatrics, and aging anxiety. Although the results were inconclusive, many of them observed that positive attitudes toward older adults were linked with greater knowledge of aging, lower aging anxiety levels and positive contact experiences with older adults.<sup>20–22</sup>

In the literature, the most common healthcare students included in the context of ageism are students of medicine, nursing and social work.<sup>18,23,24</sup> In comparison, there have been few studies on ageism among students in other healthcare professions, such as health rehabilitation science.<sup>25,26</sup> Rehabilitation is essential to reduce the impact of physical aging, enhance mobility and improve the quality of life among older adults.<sup>27</sup> Geriatric rehabilitation is defined as “evaluative, diagnostic and therapeutic interventions whose purpose is to restore functional ability or enhance residual functional capability in older people with disabling impairments.”<sup>28</sup> The demand for health rehabilitation services is increasing in line with global population growth and higher survival rates for older adults with chronic conditions and disabilities.<sup>29–32</sup> A recent systematic analysis reported that rehabilitation services can prevent a larger proportion of the global burden of disability.<sup>30</sup>

Despite the unique contribution of health rehabilitation services to optimizing the functional status of older adults, no previous study has examined ageism in students of health rehabilitation sciences across different disciplines. Previous studies have examined ageism among health rehabilitation students with only one or two disciplines included.<sup>33–35</sup> This study offers unique contributions to the studies of ageism and rehabilitation by examining ageism in a unique culture across different disciplines, which is aligned with the multidisciplinary nature of geriatric health rehabilitation services. In Saudi culture, robust values are derived from religious norms and cultural traditions that support older adults and place a great emphasis on affective bonds between family members.<sup>2</sup> However, to date, no research has been devoted to evaluating ageism among health rehabilitation students in Saudi Arabia. To bridge this limitation, this study examined attitudes toward older adults and the potential predictors influencing these attitudes among multidisciplinary rehabilitation students in Saudi Arabia. The promotion of healthy aging is a goal of Saudi Vision 2030, and tackling ageism has powerful provenance for uncovering and changing the dynamics of contemporary aging in Saudi Arabia.<sup>36</sup>

## Materials and Methods

### Study Design

A cross-sectional study using an online survey with convenience sampling.

### Participants

Invitations to participate in the study survey were sent to students studying at various institutions (twelve programs) in the Kingdom of Saudi Arabia via email. The inclusion criteria were undergraduate students in health rehabilitation science and being 18–25 years old. The student’s specialties include physical therapy, occupational therapy, respiratory therapy, speech-language pathology and audiology. The exclusion criteria were graduate students and students in other health specialties. This study was conducted in accordance with the Declaration of Helsinki, and approved by the College of Medicine Institutional Review Board of King Saud University, Riyadh, Saudi Arabia (E-22-6693), and all participants provided informed consent before starting the online survey.

### Measures

#### Demographic and Geriatric-Related Characteristics

The demographic characteristics of participants included gender, age and student program. The geriatric-related characteristics of participants included questions related to living with older adults, contact with older adults, the importance of contact with older adults, geriatric education and preferences to work with older adults after graduation.

## Attitudes Toward Older Adults

Attitudes toward older adults were evaluated using the University of California Los Angeles Geriatrics Attitude (UCLA-GA) scale.<sup>37</sup> The scale includes 14 items, containing five positively and nine negatively worded items. The participants indicated their answers to items on a 5-point Likert scale ranging from 1 indicating (strongly disagree) to 5 indicating (strongly agree), and 3 indicating (a neutral response). Scores of negatively worded statements were reverse scored to calculate the total score ( $\alpha = 0.76$ ). A higher score indicated positive attitudes toward older adults.

## Knowledge of Aging

Knowledge of aging was evaluated through Palmore's (1998) Facts on Aging quiz<sup>38</sup> which was updated and reduced to 10 true or false questions based on a previous study.<sup>39</sup> Facts on Aging Quiz (FAQ) includes items about physical, psychological, and social characteristics associated with old age. A total score was calculated by adding the number of correct responses, with higher scores indicating greater knowledge about aging.

## Aging Anxiety

Aging anxiety was measured using the anxiety about aging scale (AAS), developed by Lasher and Faulkender<sup>40</sup> and adapted into a shorter version by Drury et al 2016.<sup>41</sup> It includes four items about how participants feel about personally aging: "I am worried that I will lose my independence when I am old", "I am relaxed about getting old", "I am concerned that my mental abilities will suffer when I am old", and "I do not want to get old because it means I am closer to dying". Responses were recorded on a 7-point Likert scale (1 = strongly disagree, 7 = strongly agree). Higher scores indicated higher levels of anxiety about growing old ( $\alpha = 0.71$ ).

## Statistical Analysis

Data were analyzed using SPSS 23 (Armonk, NY). We computed appropriate descriptive statistics to describe the study sample. Study measures were normally distributed. Independent sample *t*-test and one-way ANOVA were used to examine the difference in the mean of attitudes toward older adults according to the demographic and geriatric-related characteristics of the participants. A Pearson correlation coefficient was used to examine correlations between variables. Multiple linear regression was used to assess the independent association between attitudes and the sociodemographic and geriatric-related variables. This model was built using a stepwise model selection procedure and variables in the model with the highest adjusted R-square were retained as the most parsimonious model. Multicollinearity was checked by calculating tolerance and variance inflation factors in the regression model. The results indicate no problems of multicollinearity. The statistical significance was set at  $p < 0.05$ .

## Results

A total of 301 completed the survey. Data from eight respondents was excluded because they were graduate students. The study involved 293 Saudi health rehabilitation science students aged between 19 and 25 years, with a mean (SD) age of  $21.1 \pm 1.3$  years. Most participants were female (70.3%), with 53% of the students specializing in physical therapy. Of the 293 students in the study, approximately 50% studied geriatric courses in their undergraduate program, and 69% considered working with older adults after graduation. Referring to their contacts with older adults, 71% of students reported living with older adults and 17% had contacts with older adults who were not their relatives (Table 1).

Table 2 presents descriptions of measurements of ageism, including attitudes toward older adults, knowledge of aging, and aging anxiety among students in health rehabilitation science. The average (SD) score for attitude was 3.43 (0.4), with the highest score of 4.5. The average score for the participants' knowledge of aging was 0.56 (0.2), and the aging anxiety score was 4.0 (1.3) out of a maximum of 7.0.

There were no differences in the mean total scores on attitudes toward older adults as measured by the UCLA-GA according to participant demographic and geriatric-related characteristics, except for living with older adults. Students who experienced living with older adults had more positive attitudes toward older adults ( $t = 2.20$ ,  $p = 0.032$ ) (Table 3).

Attitudes toward older adults and knowledge of aging were positively correlated ( $r = 0.32$ ,  $p < 0.0001$ ). Both aging anxiety and the age of students were not significantly correlated with attitudes toward older adults (Table 4).

**Table 1** Demographic and Geriatric-Related Characteristics of the Study Participants (n=293)

Characteristics	N (%)
Gender	
Female	206 (70.3)
Male	87 (29.7)
Age*	21.13±1.3
Specialty	
Physical therapy (PT)	156 (53.2)
Occupational therapy (OT)	44 (15.0)
Respiratory therapy (RT)	50 (17.1)
Speech-language pathology and audiology (SLP)	43 (14.7)
Do you live or have you ever lived with older adults?	
Yes	207 (70.6)
No	86 (29.4)
Are you in contact with older adults who are not family members?	
Yes	50 (17.1)
No	129 (44.0)
Sometimes	114 (38.9)
How important is contact with older adults for you?	
Very important	99 (33.8)
Important	128 (43.7)
It does not matter	57 (19.5)
Not important	9 (3.1)
Have you studied geriatric courses in your undergraduate program?	
Yes	144 (49.1)
No	149 (50.9)
Would you like to work with older adults after graduation?	
Yes	203 (69.3)
No	90 (30.7)

**Note:** \*Age presented as mean and standard deviation.

**Table 2** Descriptions of Attitudes Toward Older Adults, Knowledge of Aging, and Aging Anxiety Among Multidisciplinary Rehabilitation Students

Variables	Mean (SD)	Range
Attitudes toward older adult (UCLA_GA)	3.43 (0.40)	2.0–4.5
Knowledge of aging (FAQ)	0.56 (0.19)	0.2–1.0
Aging anxiety (AAS)	4.0 (1.30)	1.0–7.0

The result of the regression model for the participants' attitudes toward older adults was significant ( $F = 9.2$ ,  $p < 0.0001$ ). The predictors of attitudes toward older adults were knowledge of aging ( $\beta = 0.34$ ,  $p < 0.0001$ ), living with older adults ( $\beta = 0.12$ ,  $p = 0.02$ ) and the importance of contact (very important:  $\beta = 0.31$ ,  $p = 0.04$ ) were all jointly and independently associated with attitudes toward older adults, with all variables capturing about 12% of the variability in attitudes toward older adults (Table 5).

## Discussion

The increased rate population aging has led many researchers to examine the factors that influence attitudes toward older adults, especially among healthcare professionals.<sup>8</sup> This study examined the attitudes toward older adults and the

**Table 3** Differences in Attitudes Toward Older Adults According to Participant Characteristics (n = 293)

Characteristics	Categories	Attitudes Toward Older Adults		
		Mean (SD)	t/F	p value
Gender	Female	3.4 (0.4)	-1.04	0.29
	Male	3.5 (0.4)		
Specialty	PT	3.4 (0.4)	0.20	0.89
	OT	3.5 (0.4)		
	RT	3.4 (0.4)		
	SLP	3.4 (0.4)		
Do you live or have you ever lived with older adults?	Yes	3.5 (0.4)	2.20	0.032
	No	3.4 (0.4)		
Are you in contact with older adults who are not family members?	Yes	3.4 (0.4)	1.02	0.36
	No	3.4 (0.4)		
	Sometimes	3.4 (0.4)		
How important is contact with older adults for you?	Very important	3.5 (0.4)	1.03	0.38
	Important	3.4 (0.4)		
	It does not matter	3.4 (0.5)		
	Not important	3.2 (0.4)		
Have you studied geriatric courses in your undergraduate program?	Yes	3.4 (0.4)	-0.31	0.75
	No	3.4 (0.4)		
Would you like to work with older adults after graduation?	Yes	3.4 (0.4)	-0.53	0.59
	No	3.5 (0.4)		

**Abbreviations:** PT, physical therapy; OT, occupational therapy; RT, respiratory therapy; SLP, Speech-language pathology and audiology.

**Table 4** Correlations Between Attitudes Toward Older Adults and Knowledge of Aging, Aging Anxiety, and Age of Students

Variables	r (p)			
	1	2	3	4
1. Attitudes toward older adults	1			
2. Knowledge of aging	0.323 (<0.0001)**	1		
3. Aging anxiety	-0.05 (0.31)	-0.089 (0.12)	1	
4. Age	-0.07 (0.25)	-0.23 (0.0012)**	-0.02 (0.66)	1

**Note:** \*\*p < 0.01.

potential predictors influencing these attitudes among multidisciplinary rehabilitation students in Saudi Arabia. Health rehabilitation students are a key profession within multidisciplinary geriatric rehabilitation teams.

In this study, students of health rehabilitation science demonstrated positive attitudes toward older adults, which may reflect the values of their culture. Traditionally, the extended family is the main source of care for older adults in Saudi Arabia. However, the literature predicts changes in family caregiving dynamics because of the rapid economic growth in recent decades.<sup>2</sup> A previous study reported that college-aged participants in the United States with negative attitudes toward older adults were less likely to provide care for a family member.<sup>42</sup> Future studies should consider the impact of these normative changes in Saudi culture on the family interactions and attitudes of younger individuals toward older adults.

The result of this study shows that students of health rehabilitation science have moderate knowledge of aging. In contrast, a previous study showed that Saudi nursing students from different universities had poor basic knowledge of aging.<sup>43</sup> This inconsistent result could be explained by the fact that the sample in this study included students from different disciplines of health rehabilitation science. However, the moderate knowledge of aging in this sample should be taken into account, with the emphasis being placed on the importance of including geriatric education for health

**Table 5** Stepwise Multiple Regression Model for Predictors of Attitudes Toward Older Adults (n = 293)

Predictors	B	SE	$\beta$	t	P value
Knowledge of aging	0.32	0.11	0.34	6.2	<0.0001
Living with older adults					
Yes	0.11	0.05	0.12	2.2	0.02
No (ref)					
Important of contact with older adults					
Very important	0.26	0.13	0.31	2.0	0.04
Important	0.19	0.13	0.23	1.4	0.15
It does not matter	0.21	0.13	0.21	1.5	0.12
Not important (ref)					
Adjusted R <sup>2</sup> = 0.12, F=9.2, p < 0.0001					

**Notes:** B, unstandardized estimates;  $\beta$ , standardized estimates. The model was adjusted for age and gender.

**Abbreviation:** SE, standard error.

rehabilitation students. It has been reported that an adequate level of education in meeting the needs of the older adults can be beneficial for improving health care for older adults with the potential for significant cost savings.<sup>44,45</sup> Incorporating geriatric competency-based education in many healthcare disciplines has been suggested to prepare students to address the needs of aging populations with focus on health promotion and prevention.<sup>46–48</sup> In the United States, although most schools of physical therapy include aging content in their current curricula, only 10% provide a specified course in geriatrics.<sup>49</sup> In Europe, the assessment of geriatric medical education revealed high variations in its inclusion of geriatric content and delivery.<sup>50</sup> This suggests that major educational restructuring is necessary to meet the geriatric educational imperative.<sup>47</sup> Little is known about the inclusion of gerontological courses in the curricula of health rehabilitation programs among universities in Saudi Arabia and the extent to which this is enforced is also unknown. To date, in Saudi Arabia, there are no residency or fellowship training programs in geriatric studies for health rehabilitation graduates. The demographics in Saudi Arabia are shifting, and the need for competency-based geriatric education and training standards is critical for health rehabilitation students to competently care for older adults.

Students who experienced living with older adults had significantly more positive attitudes compared to those who did not. This result, supported by contact theory by Buttigieg et al 2018 states that there are fewer negative attitudes among students living with older adults since they encounter and deal with older adults on a daily basis.<sup>51</sup> This finding is consistent with the previous studies that support the notion that students can improve their attitudes and behaviors toward older adults by spending more time caring for and interacting with them.<sup>39,52</sup> However, negative contact experiences with older adults, such as dealing with sick older parents or grandparents can lead to worsened attitudes toward older adults.<sup>53</sup>

Knowledge of aging and contact with older adults (living and the importance of contact) were significant predictors of attitudes toward older adults. This finding is in tune with the theoretical model, PEACE (Positive Education about Aging and Contact Experiences), for reducing ageism by focusing on two main factors: education about aging and positive contact experiences with older adults.<sup>39</sup> Moreover, a systematic review of 63 studies found that interventions including education and intergenerational contact, presented the greatest effects on attitudes toward older adults.<sup>22</sup> A recent initiative project involving student and older adult collaboration, called CMU-CARES (Central Michigan University-Crisis Avoidance for Rural Elderly stake holders) found that geriatric education and community-based projects can serve as a paradigm for recognizing and addressing the needs of older adults.<sup>54</sup> Therefore, one can hypothesize that ageism could be reduced by disseminating correct information about aging and encouraging contact with older adults. With this extension, it is important to raise consciousness among health rehabilitation students to act as healthcare advocates and aid in the process of challenging societal misconceptions experienced by older adults in different forms.

Some potential limitations of this study should be acknowledged. The generalizability of the study may be limited, given that the sample included undergraduate Saudi students of health rehabilitation science. Future studies should

include students in rehabilitation with different levels of education and cultural backgrounds. The predictive power of the regression model in this study is relatively small, longitudinal studies should be conducted to include more variables such as the quality of contact with older adults, relationship type, willingness to provide care and cultural expectations. The ageism scales included in this study have not been comprehensively evaluated for psychometric properties. A recent systematic review highlighted the need to develop and validate a comprehensive scale with adequate psychometric properties as an essential step in combating ageism.<sup>55</sup> Despite these limitations, UCLA-GA, the FAQ, and aging anxiety are useful scales to measure attitudes toward older adults, knowledge of aging, and aging anxiety. Lastly, the use of convenience sampling could also affect the likelihood of selection bias.

The findings of this study have implication in health rehabilitation education and clinical practice. Future longitudinal and interventional studies should examine the effectiveness of incorporating geriatric competency-based education and strategies to enhance contact in addressing ageist attitudes among rehabilitation students.

## Conclusions

Examining ageism among health rehabilitation students is in alignment with the World Health Organization (WHO, 2021, para. 14) recent urgent call to combat ageism: “All countries and stakeholders are encouraged to use evidence-based strategies, improve data collection and research and work together to build a movement to change how we think, feel and act towards age and aging”.<sup>56</sup> In this study, knowledge of aging and contact with older adults (living and the importance of contact) were significant predictors of attitudes toward older adults among students of health rehabilitation science. The findings of this study could demonstrate the necessity of understanding the structure of the inequalities that underpin the position of the Saudi older population within a societal context. Future local initiatives should act as prototypes to implement competency-based geriatric education and promote positive contact with older adults.

## Acknowledgments

The author would like to acknowledge Nourah Alosan PT, for preparing the data for analysis. This work was supported by the Research Center of the Female Scientific and Medical Colleges, Deanship of Scientific Research, King Saud University, Riyadh, Saudi Arabia.

## Disclosure

The author reports no conflicts of interest in this work.

## References

1. United Nations. Department of Economic and Social Affairs. World population prospects: key findings and advance tables –the 2017 revision; 2017. Available from: <https://www.un.org/development/desa/publications/world-population-prospects-the-2017-revision.html>. Accessed September 18, 2022.
2. Karlin NJ, Weil J, Felmban W. Aging in Saudi Arabia: an exploratory study of contemporary older persons' views about daily life, health, and the experience of aging. *Gerontol Geriatr Med*. 2016;2:233372141562391. doi:10.1177/2333721415623911
3. Chang AY, Skirbekk VF, Tyrovolas S, Kassebaum NJ, Dieleman JL. Measuring population ageing: an analysis of the global burden of disease study 2017. *Lancet Public Health*. 2019;4(3):e159–e167. doi:10.1016/S2468-2667(19)30019-2
4. Fong JH. Disability incidence and functional decline among older adults with major chronic diseases. *BMC Geriatr*. 2019;19(1):1–9. doi:10.1186/s12877-019-1348-z
5. Roberts AW, Ogunwale SU, Blakeslee L, Rabe MA. *The Population 65 Years and Older in the United States: 2016*. Suitland, MD, USA: US Department of Commerce, Economics and Statistics Administration, US Census Bureau; 2018.
6. Ayalon L, Tesch-Römer C. *Contemporary Perspectives on Ageism*. Switzerland: Springer Nature; 2018.
7. Chang ES, Kannoth S, Levy S, Wang SY, Lee JE, Levy BR. Global reach of ageism on older persons' health: a systematic review. *PLoS One*. 2020;15(1):e0220857. doi:10.1371/journal.pone.0220857
8. North MS, Fiske ST. Modern attitudes toward older adults in the aging world: a cross-cultural meta-analysis. *Psychol Bull*. 2015;141(5):993–1021. doi:10.1037/a0039469
9. São José JMS, Amado CAF, Ilinca S, Buttigieg SC, Taghizadeh Larsson A. Ageism in health care: a systematic review of operational definitions and inductive conceptualizations. *Gerontologist*. 2019;59(2):e98–e108. doi:10.1093/geront/gnx020
10. Palmore EB. Research note: ageism in Canada and the United States. *J Cross Cult Gerontol*. 2004;19(1):41–46. doi:10.1023/B:JCCG.0000015098.62691.ab

11. Drydakakis N, MacDonald P, Chiotis V, Somers L. Age discrimination in the UK labour market. Does race moderate ageism? An experimental investigation. *Appl Econ Lett*. 2018;25(1):1–4. doi:10.1080/13504851.2017.1290763
12. Ng R, Lim-Soh JW. Ageism linked to culture, not demographics: evidence from an 8-billion-word corpus across 20 countries. *J Gerontol B Psychol Sci Soc Sci*. 2021;76(9):1791–1798. doi:10.1093/geronb/gbaa181
13. Lee MA, Song R. I am not supposed to be treated like this: associations between age discrimination, perceived social respect for older adults, and depressive symptoms in Korean older adults. *J Gerontol B Psychol Sci Soc Sci*. 2022;2022:gbac112.
14. Allen JO, Solway E, Kirch M, et al. Experiences of everyday ageism and the health of older US adults. *JAMA Netw Open*. 2022;5(6):e2217240. doi:10.1001/jamanetworkopen.2022.17240
15. Marques S, Mariano J, Mendonça J, et al. Determinants of ageism against older adults: a systematic review. *Int J Environ Res Public Health*. 2020;17(7):2560. doi:10.3390/ijerph17072560
16. Wilson DM, Errasti-Ibarrodo B, Low G. Where are we now in relation to determining the prevalence of ageism in this era of escalating population ageing? *Ageing Res Rev*. 2019;51:78–84. doi:10.1016/j.arr.2019.03.001
17. Levy BR, Slade MD, Chang ES, Kanno S, Wang SY. Ageism amplifies cost and prevalence of health conditions. *Gerontologist*. 2018;60(1):174–181. doi:10.1093/geront/gny131
18. Cheung K, Tamura P, Malik Z, et al. Barriers and motivators to specializing in geriatrics and strategies for recruitment: scoping review. *Gerontol Geriatr Educ*. 2022;1–17. doi:10.1080/02701960.2022.2078814
19. Seferoğlu M, Yıldız D, Pekel NB, Güneş A, Yıldız A, Tufan F. Attitudes of neurology specialists toward older adults. *Aging Clin Exp Res*. 2017;29(4):787–792. doi:10.1007/s40520-016-0606-6
20. Donizzetti AR. Ageism in an aging society: the role of knowledge, anxiety about aging, and stereotypes in young people and adults. *Int J Environ Res Public Health*. 2019;16(8):1329. doi:10.3390/ijerph16081329
21. Ha J, Kim J. Ageism and the factors affecting ageism among Korean nursing students: a cross-sectional study. *Int J Environ Res Public Health*. 2021;18(4):1798. doi:10.3390/ijerph18041798
22. Burnes D, Sheppard C, Henderson CR, et al. Interventions to reduce ageism against older adults: a systematic review and meta-analysis. *Am J Public Health*. 2019;109(8):e1–e9. doi:10.2105/AJPH.2019.305123
23. Galzignato S, Veronese N, Sartori R. Study of the attitudes and future intentions of nursing students towards working with older people: an observational study. *Aging Clin Exp Res*. 2021;33(11):3117–3122. doi:10.1007/s40520-021-01840-z
24. Baik S, Davitt JK. Factors associated with attitudes toward older adults in social work students: a systematic review. *J Gerontol Soc Work*. 2022;65(2):168–187. doi:10.1080/01634372.2021.1944946
25. Kalu ME, Abaraogu UO, Norman KE. Do physiotherapy students demonstrate ageist attitude? A scoping review of literature. *Phys Occup Ther Geriatr*. 2018;36(1):72–89. doi:10.1080/02703181.2018.1440040
26. Forlenza ST, Bourassa D, Lyman M, Coughlin M. Ageism, priming, and working with older adults among undergraduate exercise science students. *Phys Occup Ther Geriatr*. 2019;37(1):50–66. doi:10.1080/02703181.2019.1611691
27. Stott DJ, Quinn TJ. Principles of rehabilitation of older people. *Medicine*. 2017;45(1):1–5. doi:10.1016/j.mpmed.2016.10.002
28. Achterberg WP, Cameron ID, Bauer JM, Schols JM. Geriatric rehabilitation—state of the art and future priorities. *J Am Med Dir Assoc*. 2019;20(4):396–398. doi:10.1016/j.jamda.2019.02.014
29. Cieza A, Causey K, Kamenov K, Hanson SW, Chatterji S, Vos T. Global estimates of the need for rehabilitation based on the global burden of disease study 2019: a systematic analysis for the global burden of disease study 2019. *Lancet*. 2021;396(10267):2006–2017. doi:10.1016/S0140-6736(20)32340-0
30. Jesus TS, Landry MD, Hoenig H. Global need for physical rehabilitation: systematic analysis from the global burden of disease study 2017. *Int J Environ Res Public Health*. 2019;16(6):980. doi:10.3390/ijerph16060980
31. Gupta N, Castillo-Laborde C, Landry MD. Health-related rehabilitation services: assessing the global supply of and need for human resources. *BMC Health Serv Res*. 2011;11(1):276–286. doi:10.1186/1472-6963-11-276
32. Bean JF, Orkaby AR, Driver JA. Geriatric rehabilitation should not be an oxymoron: a path forward. *Arch Phys Med Rehabil*. 2019;100(5):995–1000. doi:10.1016/j.apmr.2018.12.038
33. Blackwood J, Sweet C. The influence of ageism, experience, and relationships with older adults on physical therapy students' perception of geriatrics. *Gerontol Geriatr Educ*. 2017;38(2):219–231. doi:10.1080/02701960.2015.1079709
34. Giles L, Paterson J, Butler SJ, Stewart JJ. Ageism among health professionals: a comparison of clinical educators and students in physical and occupational therapy. *Phys Occup Ther Geriatr*. 2002;21(2):15–26. doi:10.1080/J148v21n02\_02
35. Darling RM. Knowledge of aging and attitudes towards older people by communication sciences and disorders students. *Contemp Issues in Commun Sci Disord*. 2016;43:50–63. doi:10.1044/cicsd\_43\_S\_50
36. Saudi 2030 vision; 2016. Available from: <https://Vision2030.Gov.Sa/En>. Accessed September 20, 2022.
37. Reuben DB, Lee M, Davis JW, et al. Development and validation of a geriatrics attitudes scale for primary care residents. *J Am Geriatr Soc*. 1998;46(11):1425–1430. doi:10.1111/j.1532-5415.1998.tb06012.x
38. Palmore EB. *The Facts on Aging Quiz: A Handbook of Uses and Results*. New York, NY, USA: Springer; 1988.
39. Lytle A, Levy SR. Reducing ageism: education about aging and extended contact with older adults. *Gerontologist*. 2019;59(3):580–588. doi:10.1093/geront/gnx177
40. Lasher KP, Faulkender PJ. Measurement of aging anxiety: development of the anxiety about aging scale. *Int J Aging Hum Dev*. 1993;37(4):247–259. doi:10.2190/1U69-9AU2-V6LH-9Y1L
41. Drury L, Hutchison P, Abrams D. Direct and extended intergenerational contact and young people's attitudes towards older adults. *Br J Soc Psychol*. 2016;55(3):522–543. doi:10.1111/bjso.12146
42. Sutter M, Perrin PB, Tabaac AR, Parsa L, Mickens M. Do Ableism and ageism predict college students' willingness to provide care for a family member with a chronic health condition? *Stigma Health*. 2017;2(2):110–120. doi:10.1037/sah0000045
43. Alamri BH, Xiao LD. Health professionals' knowledge and attitudes toward older people in primary care in Saudi Arabia. *Saudi Med J*. 2017;38(3):229. doi:10.15537/smj.2017.3.19293
44. Rentsch S, Vitale CA, Zietlow K. Prioritizing geriatrics in medical education improves care for all. *Med Educ Online*. 2022;27(1):2105549. doi:10.1080/10872981.2022.2105549



45. Inouye SK. Creating an anti-ageist healthcare system to improve care for our current and future selves. *Nat Aging*. 2021;1(2):150–152. doi:10.1038/s43587-020-00004-4
46. Phelan EA, Genshaft S, Williams B, Logerfo JP, Wagner EH. A comparison of how generalists and fellowship-trained geriatricians provide “geriatric” care. *J Am Geriatr Soc*. 2008;56(10):1807–1811. doi:10.1111/j.1532-5415.2008.01942.x
47. Masud T, Ogliari G, Lunt E, et al. A Scoping review of the changing landscape of geriatric medicine in undergraduate medical education: curricula, topics and teaching methods. *Eur Geriatr Med*. 2022;13:513–528. doi:10.1007/s41999-021-00595-0
48. Sun W, Grabkowski M, Zou P, Ashtarieh B. The development of a deprescribing competency framework in geriatric nursing education. *West J Nurs Res*. 2021;43(11):1043–1050.
49. Bardach SH, Rowles GD. Geriatric education in the health professions: are we making progress? *Gerontologist*. 2012;52(5):607–618. doi:10.1093/geront/gns006
50. Fisher JM, Masud T, Holm EA, et al. New horizons in geriatric medicine education and training: the need for pan-European education and training standards. *Eur Geriatr Med*. 2017;8(5–6):467–473. doi:10.1016/j.eurger.2017.07.022
51. Buttigieg SC, Ilinca S, de Sao Jose JM, Larsson AT. Researching ageism in health-care. In: *Contemporary Perspectives on Ageism*. Switzerland: Springer Nature; 2018:493–515.
52. Miron AM, Schmidt BJ, Schlueter A, Patterson M, O’Connell S. Improving nursing students’ perspective taking, perceptions of humanness, and attitudes toward older adults. *Gerontol Geriatr Educ*. 2021;42(4):564–577. doi:10.1080/02701960.2019.1621864
53. Harwood J, Hewstone M, Paolini S, Voci A. Grandparent-grandchild contact and attitudes toward older adults: moderator and mediator effects. *Personal Soc Psychol Bull*. 2005;31(3):393–406. doi:10.1177/0146167204271577
54. Pandey J, Varriano B, Beatty A. Two birds with one stone: geriatric competency learning promotes hidden curriculum in the era of COVID-19. *Med Educ Online*. 2022;27(1):2035201. doi:10.1080/10872981.2022.2035201
55. Ayalon L, Dolberg P, Mikulionienė S, et al. A systematic review of existing ageism scales. *Ageing Res Rev*. 2019;54:100919. doi:10.1016/j.arr.2019.100919
56. World Health Organization. Ageism is a global challenge: UN; 2021. Available from: <https://www.who.int/News/Item/18-03-2021-Ageism-Is-a-Global-Challenge-Un>. Accessed September 20, 2022.

Journal of Multidisciplinary Healthcare

Dovepress

## Publish your work in this journal

The Journal of Multidisciplinary Healthcare is an international, peer-reviewed open-access journal that aims to represent and publish research in healthcare areas delivered by practitioners of different disciplines. This includes studies and reviews conducted by multidisciplinary teams as well as research which evaluates the results or conduct of such teams or healthcare processes in general. The journal covers a very wide range of areas and welcomes submissions from practitioners at all levels, from all over the world. The manuscript management system is completely online and includes a very quick and fair peer-review system. Visit <http://www.dovepress.com/testimonials.php> to read real quotes from published authors.

Submit your manuscript here: <https://www.dovepress.com/journal-of-inflammation-research-journal>