# RESEARCH



# Evaluation of dental students' attitude to elderly patients based on demographic data: a cross-sectional study



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# Abstract

**Background** Comprehensive curricular modifications in dental education are essential to address the healthcare needs of the growing geriatric population. In this context, incorporating attitudes of dental students towards this complex patient group into the design of educational programs is crucial for developing effective curricula. The aim of this study was to evaluate the attitudes of dental students towards elderly patients during their educational progress, which is a crucial period in the formation of dentists' approaches to patients and treatment, and to consider the influence of demographic data in this process.

**Methods** In this cross-sectional study, a two-part questionnaire was administered to 3rd-, 4th-, and 5th-year students at Marmara University, Faculty of Dentistry. The first part collected demographic data on age, gender, place of residence, presence of grandparents, and history of living with grandparents. The second part used the validated Ageism Scale for Dental Students (ASDS) with 5 items on a 6-point Likert scale. Mann-Whitney U and Kruskal-Wallis tests were used for two- and multi-group comparisons, respectively, and the Spearman Correlation Test examined age-scale score relationships. A Type 1 error rate of 0.05 was applied.

**Results** A total of 305 students participated, 204 (66.9%) of whom were female. The distribution across the 3rd, 4th, and 5th years was 35.1%, 32.1%, and 32.8%, respectively. The median ASDS score was 3.2. No significant differences in ASDS scores were found concerning age (p=0.925), gender (p=0.631), year of study (p=0.581), place of residence (p=0.282), presence of grandparents (p=0.199), or history of living with grandparents (p=0.859).

**Conclusion** Demographic factors did not significantly affect ASDS scores. Larger, translated, and validated studies in different regions of Türkiye are needed. However, the neutral attitudes observed among students suggest that the content of geriatrics in dentistry education should be strengthened in a way that promotes positive attitudes towards elderly patients.

Keywords Ageism, ASDS, Geriatric dentistry, Dental education, Restorative dentistry

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# Background

The global population is undergoing a rapid process of ageing. It is noted that there is a strong link between oral health, overall body health, and longevity [1]. Enhancing the quality of life for elderly individuals is a key concern for healthcare providers and government agencies [2]. One of the essential steps in enhancing quality of life is maintaining optimal oral health. The ageing process has an impact on a number of oral health issues, including tooth loss, root surface caries, periodontal diseases, reduced salivary flow and the development of oral lesions [3]. Furthermore, the advent of modern healthcare has resulted in a greater number of older adults retaining their natural teeth. Consequently, today's elderly population requires more oral healthcare than previous generations. Individuals of all age groups desire functional and esthetically pleasing teeth. Older adults also seek dental services to improve both their physical appearance and social status [4]. In order to adequately address the specific needs and demands of older adults, dentists must possess a comprehensive understanding of the psychological, physiological, and social factors that influence oral health in elderly individuals [5]. Furthermore, the attitudes of dentists towards their patients also has an impact on the quality of the care they provide.

There is a tendency among physicians to discriminate against elderly patients for several reasons, including the limitations of the patients themselves, deficiencies in the dental education process, and a lack of experience on the part of the physicians. The World Health Organization (WHO) has identified age discrimination as a significant barrier preventing older patients from accessing age-appropriate healthcare [6]. One of the most significant challenges facing the growing older population will undoubtedly be ageism. Research suggests that ageism may be more prevalent than other forms of discrimination, including sexism and racism [7]. This situation highlights the necessity for significant measures to be taken within the field of dentistry to guarantee that elderly patients are able to access the care they require. To enhance the standard of oral health services for the elderly population and to address deficiencies in the knowledge and awareness of dentists regarding existing concepts and practices, targeted modifications to educational programs are imperative [8]. Furthermore, it is possible that the specialization in geriatric dentistry will become a widely required field of expertise.

It is more likely that older patients will present with oral cavity alterations that have an adverse impact on their quality of life. This is due to a combination of factors, including their pre-existing medical history, increased comorbidities and the challenges associated with dental maintenance [9]. As a consequence of the aging process, the increase in elastic modulus and hardness results in more brittle and crack-prone enamel tissue; while the increase in gingival recession, salivary gland dysfunction, and less effective oral hygiene and decreased oral motor function lead to increased root caries. These clinical conditions require special attention in restorative approaches for elderly patients. In the long term, oral health management and patient-centered prevention of the disease will be the proper approach to provide ethical and conservative treatment to elderly patients [10, 11]. It is imperative that the physician administering the treatment considers cognitive disorders such as dementia, which may impact the treatment process and the patient's cooperation, as well as social and psychological factors such as loneliness and depression. In order to increase awareness about the factors affecting this treatment on the way to the success of the treatment, it is essential to initially investigate the current level of consciousness [12].

A review of population studies conducted in Türkiye reveals a rapid ageing of the population, a trend that is also observed globally. According to data released by the Turkish Statistical Institute (TURKSTAT), the population aged 65 and over, categorized as the elderly population, was 7,186,204 in 2018. Over the past five years, it has increased by 21.4%, reaching 8,722,806 in 2023. This significant increase observed in a short period raises concerns about whether countries are adequately equipped to meet the needs of an aging population.

In consideration of the demographic ageing and the anticipated increase in demand for geriatric healthcare services, understanding dental students' attitudes towards elderly patients is becoming increasingly important. While numerous studies in Türkiye have examined attitudes towards elderly patients in fields such as healthcare, nursing, and medicine, there is a noticeable lack of research focusing specifically on the attitudes of dental students towards older adults [13–15]. It is important to understand these attitudes, identify educational needs and promote geriatric competencies in dental education through new studies. One of the main motivations for conducting this study was to address a gap in the existing literature and to encourage further research in this area.

The objective of this study was to evaluate the attitudes of dental students in a Faculty in Istanbul (Türkiye) towards elderly patients during their educational phase, which is a crucial period in the formation of dentists' approaches to patients and treatment methods, and to consider the influence of demographic data in this process. The present study was conducted in Istanbul, a city characterized by its cultural and linguistic diversity due to both internal migration and international population mobility. Given the culturally and demographically diverse population in cities such as Istanbul, it is essential to utilize evaluation instruments with universal applicability when assessing students' attitudes in such settings.

Although various scales for evaluating students' attitudes towards elderly patients have been developed in many disciplines in the field of healthcare, dentistry lacks sufficient discipline-specific scales tailored to its unique clinical context [13, 16, 17]. The Ageism Scale for Dental Students (ASDS), developed by a group of researchers from the University of Iowa, has been validated by numerous researchers worldwide [18-26]. It has been suggested that the ASDS may assist in the identification of these dimensions of ageism among dental students, with the objective of reducing ageism among dental students and future healthcare professionals [27]. The use of this scale was preferred as it is specifically designed to assess the attitudes of dental students and is a current, discipline-specific instrument. In the present study, the original version of the validated five-item ASDS [19] was used to evaluate the students' attitudes towards elderly patients.

# Methods

This cross-sectional study was designed to evaluate dental students' attitudes towards elderly patients. The null hypothesis of this study is that there is no significant difference between ageism score and demographic factors among dental students.

This study was conducted among 3rd-, 4th-, and 5thyear students at Marmara University, Faculty of Dentistry, who had previously undertaken a course with a focus on geriatric dentistry and had commenced their clinical experience. The total number of eligible participants was 447. Based on a 95% confidence level and a 5% margin of error, the minimum required sample size was calculated to be approximately 208 participants. Of these, 305 students completed the questionnaire, yielding a response rate of 68.2%.

In the faculty, students receive clinical practice and geriatric dentistry education from the fifth semester onwards, as part of the ten-semester curriculum. The faculty's medium of instruction is English. The validated five-item version of the ASDS questionnaire was administered in the original English language to students at the faculty, which also hosts international students. The five items exhibited enhanced internal consistency, as indicated by a Cronbach's  $\alpha$  coefficient of 0.76 [19].

The initial section of the questionnaire pertains to demographic data and comprises six items. The subsequent section incorporates the ASDS, comprising 5 questions (Table 1). The responses to each question on the ageism scale were recorded using a 6-point Likert scale (strongly disagree = 1, disagree = 2, slightly disagree = 3, slightly agree = 4, agree = 5 and strongly agree = 6). The demographic section comprises questions relating to age, gender (F/M), grade, place of residence (permanent address; cities with populations over or under 100,000), the presence of grandparents in their family (if there were any older persons in their family) (Y/N), if they currently lived or have ever lived with older people (Y/N).

The questionnaire, created using Google Surveys (Google Inc., USA), was distributed to students via a digital link. Participation in the survey was entirely voluntary, and informed consent was obtained from all participants at the beginning of the survey. A flow chart illustrating the inclusion and exclusion process of participants is presented in Fig. 1.

The survey did not yield any discernible information, approval was granted by the ethics committee. (2024/01-SB)

## Statistical analysis

The SPSS v29 (IBM Inc., USA) was used for the analysis of the data. The normality of the data distribution was assessed using both statistical and visual methods, including the Shapiro-Wilk test, the mean/SD ratio, and kurtosis-skewness values as statistical criteria, as well as histograms and Q-Q plots as visual methods. According to these evaluations, the dataset was considered not to follow a normal distribution. Descriptive data are presented as numbers (%) for categorical variables and medians (25th-75th percentiles) for continuous variables. For comparisons between groups, the Mann-Whitney U Test was used for two-group comparisons, and the Kruskal-Wallis Test was used for comparisons of more than two groups. The Spearman Correlation Test was employed to examine the relationship between age and scale scores. A Type 1 error rate of 0.05 was accepted for all analyses.

 Table 1
 Median score distribution of validated items on the ASDS scale (Marmara University, Faculty of Dentistry, 2024)

	Questions	Median		
		Percentiles)		
Q13	Elderly people do not take good care of their teeth	4 (3–5)		
Q14	Elderly patients do not usually comply with dental advice	4 (3–5)		
Q16	The elderly patient does not live long enough to make it worthwhile to invest time and effort in complex dental treatment	2 (1-3)		
Q17	The elderly patient does not live long enough to make it worthwhile to invest money in expensive dental treatment	2 (1-3)		
Q18	Dental treatment of elderly patients is too time-consuming	3 (2–4)		



Fig. 1 Flow chart of participant inclusion and exclusion criteria in the study

Table	2	Distributio	ו of stuc	dents'	descrip	otive cl	haracter	istics
(Marr	nara	University	Faculty	of De	entistry	, 2024)	)	

	Number (%)
Gender	
Female	204 (66.9)
Male	101 (33.1)
Grade	
3rd	107 (35.1)
4th	98 (32.1)
5th	100 (32.8)
Population Size of Place of Residence	
< 100,000	45 (14.8)
>100,000	260 (85.2)
Grandparents' Status (Aged 65 or Older)	
At least one grandparent is alive	272 (89.2)
All grandparents are deceased	33 (10.8)
History of Living with Grandparents(Aged 65 or Older)	
Yes	110 (36.1)
No	195 (63.9)
	Median
	(25th– 75th
	Percentiles)
Age	23 (22–24)
ASDS score	3.2 (2.6–3.6)

ASDS: Ageism scale for dental students

# Results

The study was conducted at Marmara University Faculty of Dentistry between 29/08/2024 and 05/09/2024 with the participation of 305 students. The survey received a total of 68.2% of responses from the 447 undergraduate students (including the 3rd, 4th and 5th year students).

Of the students, 66.9% were female (n = 204), 33.1% were male (n = 101), and 85.2% came from cities with

populations over 100,000 (n = 260). Additionally, 10.8% had no living grandparents (n = 33), 89.2% had at least one grandparent alive (n = 272). 63.9% had never lived in the same household as any grandparent aged 65 or over (n = 195). The median age distribution (25th–75th percentiles) was 23 years [22–24]. Participants consisted of 35.1% in the 3rd year, 32.1% in the 4th year and 32.8% in the 5th year. The median ASDS score is 3.2 (2.6–3.6) (Table 2; Fig. 2).

When analyzing the distribution of ASDS scale scores based on various student characteristics, the median score (25th–75th percentile) was found to be 3.2 (2.6– 3.7) for females, 3.2 (2.6–3.6) for males, Across academic years, the medians were similar: 3.2 (2.6–3.8) for 3rdyear students, 3.2 (2.6–3.6) for 4th-year students, and 3.2 (2.6–3.8) for 5th-year students. Additionally, for those coming from cities with populations under 100,000, the median was 3.2 (2.6–3.6), and for those from cities with populations over 100,000, it was 3.2 (2.6–3.8). Among students with at least one living grandparent, the median was 3.2 (2.6–3.6), while for those whose grandparents were all deceased, it was 3.4 (2.8–3.8). The median for students who lived with their grandparents was 3.2 (2.6– 3.8), and for those who did not, it was 3.2 (2.6–3.6).

No statistically significant differences were found in any of the distributions (gender p = 0.631; grade p = 0.581; population size of place of residence p = 0.282; grandparents' status p = 0.199; history of living with grandparents p = 0.859) (Table 3). In addition, the correlation between age and ASDS scale score was examined, and no significant difference was found (Spearman Correlation Test, p = 0.925).

The median score was the highest for the belief that elderly patients do not take good care of their teeth and





	ASDS Score	<i>p</i> value	
	Median (25th– 75th Percentiles)		
Gender			
Female	3.2 (2.6–3.7)	0.631*	
Male	3.2 (2.6–3.6)		
Grade			
3rd	3.2 (2.6–3.8)	0.581**	
4th	3.2 (2.6–3.6)		
5th	3.2 (2.6–3.8)		
Population Size of Place of Residence			
< 100,000	3.2 (2.6–3.6)	0.282*	
>100,000	3.2 (2.6–3.8)		
Grandparents' Status			
At least one grandparent is alive	3.2 (2.6–3.6)	0.199*	
All grandparents are deceased	3.4 (2.8–3.8)		
History of Living with Grandparents			
Yes	3.2 (2.6–3.8)	0.859*	
No	3.2 (2.6–3.6)		
ASDS: Ageism scale for dental students			

Table 3 Distribution of ASDS scores by students' sociodemographic characteristics (Marmara University, Faculty of Dentistry, 2024)

\*Mann-Whitney U Test

\*\*Kruskal Wallis Test

that they do not comply with dental advice (Q13-14; median: 4, 25th–75th percentiles: 3–5). Conversely, the perception that elderly patients do not live long enough to justify expensive or complex dental treatments received the lowest scores (Q16-17; median: 2, 25th–75th percentiles: 1–3) (Table 1).

# Discussion

Within the scope of this study, it is intended that the data obtained will serve as a guide for faculty members, students, and clinicians in Türkiye regarding their attitudes towards the elderly. Addressing the gaps in the curriculum will help to prepare future practitioners for potential challenges they may encounter and enhance the quality of treatments provided.

Questions Q13, Q14, Q16, Q17, and Q18, provided by ASDS-USA with high reliability and validity, have been shown to be reliable in multiple countries where the ASDS survey has been administered [19–21, 23, 28]. When examining the issues highlighted by these questions, the costs associated with dental treatments for elderly patients may be considered one of the topics that unites dental students around a common concern. Additionally, the combined use of questions Q13, Q14, Q16, and Q17 is thought to facilitate universal applicability [20]. Various factors such as rising threats of war, social inequalities, and the freedom to pursue education have led to increased global population mobility. As a consequence of immigration, numerous countries have become increasingly diverse, with a multitude of nations, cultures and languages coexisting within their borders. The demographic structure shaped by migration has led to the emergence of a continuously evolving and diverse society, as new generations attempt to integrate both their own cultural heritage and the culture of the host country. Notably, refugee migrations resulting from wars in nearby regions are among the factors contributing to the diversity in Türkiye. With its high educational capacity, Türkiye stands out in Europe and hosts multilingual and international universities, attracting students from 180 countries, particularly from Asia, the Middle East, Africa, and Europe. Istanbul, where this study is conducted, is a preferred city for many individuals not only due to economic opportunities but also because of its educational facilities. This contributes to a multicultural and multinational demographic structure in Istanbul, shaped by both regional differences within the country and the diversity brought by individuals migrating from various nations [29]. At Marmara University Faculty of Dentistry, where the language of instruction is English and international students are enrolled, the original version of ASDS scale [19], developed in the United States—a country known for hosting large numbers of international students and significant migration-has been utilized. It is acknowledged that when assessing the validity and reliability of scales, not only language translations are considered, but expressions and even certain attitudes are evaluated within a cultural context. The increase in multicultural communities highlights the need for scales that allow for universal application. Nevertheless, as outlined in the limitations, the absence of a culturally adapted Turkish version is a valuable consideration for future research.

The median ASDS score of 3.2 on the 6-point Likert scale indicates that the students exhibited a neutral attitude towards elderly patients. The fact that the score was highest for the belief that older patients do not take good care of their teeth and do not follow dental advice may be attributable to the established fact that older individuals frequently exhibit diminished motor abilities and dementia-related impairments [30]. Question 16-17 reflects a widely held, seemingly global perception of age discrimination, whereby treatment decisions are based solely on chronological age [23]. The hypothesis that elderly patients do not have sufficient life expectancy to merit investment in costly dental interventions is associated with more general concerns regarding the cost-effectiveness of such treatment. This perception suggests that significant inequalities in access to dental services may arise, particularly among individuals experiencing socio-economic disadvantage. It is stated that these inequalities have the potential to persist unless oral health is integrated into general health policies and coverage frameworks [22]. The low scores for items Q16 and Q17 indicate that students generally disagree with the notion that age should determine access to dental treatment. This finding may reflect their belief that healthcare is a universal right and should be provided according to need. Moreover, the ongoing efforts in Türkiye to improve access to free dental services might also play a role in shaping students' more inclusive attitudes.

When evaluating the study's results, no difference was found in ageism scores between men and women. In a systematic review conducted by Bulgarelli et al., which assessed dental students' attitudes to treating elderly patients, it was reported that female students demonstrated a more positive approach than male students. This was attributed to the higher empathy levels observed in females [31]. The studies were conducted at the University of Iowa indicate that women exhibit lower levels of ageism. Nevertheless, a study conducted in Türkiye examining healthcare professionals' attitudes towards older people revealed no significant gender differences [14].

In this study, the population size of the students' place of residence (above or below 100,000 inhabitants) was included as a proxy indicator to distinguish between urban and non-urban living environments. As a result of urbanization, young individuals are moving away from traditional family life and the perception of wise elders is disappearing [32]. The weakening of intergenerational connections and students' background—whether coming from urban or rural areas—may play a role in shaping their attitudes towards elderly. The status of students' place of residence, categorized as either above or below 100,000 in population, was found to have no influence on ageism scores. Similarly, in a study conducted by Alhajj et al. across 10 different Arabic countries using the ASDS scale, it was reported that residing in either urban or rural areas had no significant effect on the scores [28]. Another study conducted in Türkiye investigating the attitudes of healthcare students towards the elderly found that factors such as place of residence, living in an extended or nuclear family, and cohabiting with elderly parents did not significantly influence students' attitudes [13].

In studies conducted by Kossioni et al. and Rucker et al. assessing dental students' attitudes towards the elderly, it was found that having participants with a history of living with elderly individuals did not affect the ageism scores compared to those without such experience [19, 21]. Similarly, the present study revealed no significant differences in ageism scores between participants with and without grandparents living in their families, or between those with and without a history of living with elderly family members. Remarkably, Popovac et al. reported that students with a history of living with their grandparents exhibit higher levels of ageist attitudes. This situation has been attributed to the emergence of negative feelings among generations who are in constant interaction, particularly due to the caregiving needs of the elderly [23]. In researches conducted in Switzerland and Romania, it was stated that students with elderly relatives showed less ageism [22, 26]. The presence of grandparents in the family and early exposure to older adults during childhood have been reported to influence emotional development in children. It is believed that such interactions contribute to the development of compassionate and empathetic attitudes towards the elderly [33] and exposure during early life may result in the development of more positive attitudes and behaviors towards geriatric patients [26, 34]. In this study, as in previous similar studies, only binary (yes/no) information was obtained when evaluating the history of living with grandparents (aged 65 or over), and details about the interval of living with the elderly, which may affect the attitude of individuals towards the elderly, were not obtained. This is one of the limitations of this study.

The analysis revealed that there was no statistically significant difference in ASDS scores across the various educational grade levels. The data obtained from the Greek and Serbian versions of the ASDS and the Japanese version indicate that as the number of years spent in education increases, students' ageism scores tend to decrease [21, 23, 25]. No differences were observed in the ASDS-USA version, which was used to assess students in grades 3 and 4, or in the ASDS-Romanian version, which was used to assess students in the 8th, 10th, and 12th semesters, in accordance with the findings of the current study [19, 22]. The results of the ASDS-Fr indicate that as students' progress through their years of study, increased clinical experience appears to enhance their confidence in treating elderly patients. However, this may also result in an increase in ageist attitudes [20]. The presence of

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geriatric dentistry focused courses within the curricula of different countries or the inclusion of gerodontology as a standalone subject may contribute to these differences. Furthermore, variations in the extent to which students interact.

with elderly patients across clinics may also be a contributing factor.

While comparing ASDS scores with demographic variables, it is important to interpret the lack of significant differences with caution. This may suggest that students hold generally neutral attitudes towards elderly patients. However, it is also possible that the use of the five-item version of the ASDS limited the scale's sensitivity to detect demographic differences. Although the students were proficient in English due to the medium of instruction at the faculty, differences in cultural context and language interpretation may have influenced how certain items were understood. It is thought that it is necessary to be careful when making cultural adaptation in this type of educational environment where individuals with various ethnic, linguistic and cultural backgrounds come together. The increasing diversity of student populations around the world underscores the necessity for the development and refinement of instruments that can be reliably used across such contexts. Similar to the study conducted in Switzerland [26], which emphasized the need for region-specific validation, it may be appropriate to consider separate validation efforts in linguistically or culturally distinct populations in Türkiye. Future research in Türkiye may benefit from the development of culturally adapted ASDS versions and from contributing to efforts that enhance the cross-cultural validity of ageism assessment tools for global use.

As observed in the literature, a study evaluating ageing stereotypes among health sciences students and faculty members, including dental professionals, reported that participants from lower socioeconomic backgrounds tend to hold more positive stereotypes towards the elderly [35]. This indicates that socioeconomic background may be a relevant factor influencing attitudes and could be considered in future studies.

In recent years, especially about the relationship between the oral health and systemic health of geriatric patients, it has been emphasized that lectures on oral health should be included in the curricula of medical science programs in order to establish an integrated education system [36] When examining the curricula of leading dental faculties in Türkiye, it is observed that some include a specific focus on restorative approaches for geriatric patients within the course flow of the Department of Restorative Dentistry, while others do not. A number of faculties offer separate elective or mandatory courses covering gerodontology or geriatric content within other departments. Specifically in restorative dentistry, recognizing the lack of geriatricfocused courses and moving away from the perception that elderly patients only require prosthetic treatments is considered crucial. Incorporating such courses into the curriculum would better equip students to confidently address the restorative treatment needs of elderly patients in their professional careers. Although the effect of the geriatric curriculum was not directly evaluated in this study, literature reviews show that the curriculum's inclusion of geriatric dentistry and standardized content are among the factors affecting students' approach to patients [21]. In addition to theoretical knowledge, the importance of incorporating components such as empathy, communication skills and social responsibility into dental education has also been emphasised as essential for shaping positive attitudes towards older adults [12].

The most significant challenges in geriatric dentistry education are identified as inadequate course duration, financial resources and the limited number of academic institutions offering gerodontic instruction [37, 38]. In addition, Ozan et al. stated that dentists have identified deficiencies in the current dental education program concerning the lectures on the relationship between oral and systemic health in geriatric patients [39]. Similarly, a previous study has suggested that the advancement of geriatric dentistry can be realized through the incorporation of undergraduate courses and the enhancement of awareness among dentists undergoing training [40]. Considering the findings in the literature, it is recommended that the Departments of Restorative Dentistry within dental faculties in Türkiye consider incorporating geriatric dentistry into their curricula to promote a more comprehensive level of education. Geriatric dentistry is a distinct specialty in countries with a high elderly population and has the potential to evolve into a specialized field in Türkiye in the future.

One of the limitations of the study is that it was conducted at a single dental faculty and included 3rd-, 4th-, and 5th-year students. This may have introduced selection bias and limits the generalizability of the results to other institutions and student populations. The findings of this study will facilitate the development of new researches. Further evaluation would benefit from comprehensive studies involving a larger number of participants and including various dental faculties from different regions of Türkiye.

# Conclusion

Within the limitations of the current study, gender, student year, presence of grandparents in the family, experience of living with grandparents (aged 65 and over), and population size of the place of residence were found to have no significant effect on the ageism scores of dental students. While the findings suggest a neutral attitude towards older adults among students, the presence of more specific views may have been obscured by this neutrality. It is hypothesized that these differences would be more clearly observed with a more diverse, stratified, and culturally compatible sample. It is also thought that the curriculum should be integrated in a way that is not limited to theoretical knowledge only and allows students to gain empathy and social responsibility towards the elderly. To increase the practical importance of such integration, the following practical recommendations are suggested: (1) inclusion of clinical rotations that include elderly patients to provide direct experience with geriatric care; (2) simulation-based educational modules to prepare students for common age-related disorders; and (3) interdisciplinary workshops that encourage collaborative learning and a more holistic approach to elderly patient care with the participation of geriatric specialists. These findings should be interpreted with caution, as the sample size and scope of the study may not have fully covered all possible influencing factors, and the results are not considered generalizable to nationwide attitudes.

#### Abbreviations

ASDS Ageism scale for dental students TURKSTAT Turkish statistical institute WHO The world health organization

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#### Author contributions

Conceptualization, B.K.G, P.Y.A., B.T.; methodology, B.K.G, A.A.Ş., B.D.K., P.Y.A., B.T.; software, B.K.G., A.A.Ş., B.D.K.; formal analysis, B.D.K., P.Y.A.; investigation, B.K.G., A.A.Ş., B.D.K.; data curation, B.T., P.Y.A.; writing—original draft preparation, B.K.G, A.A.Ş., B.D.K.; writing—review and editing, B.K.G, A.A.Ş., B.D.K., P.Y.A., B.T.; supervision, P.Y.A., B.T.; administration, B.K.G., A.A.Ş., B.D.K., P.Y.A., B.T.; administration, B.K.G., A.A.Ş., B.D.K., P.Y.A., B.T. All authors have read and agreed to the published version of the manuscript.

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#### Data availability

The complete dataset generated and analyzed during the current study is available from the corresponding author upon reasonable request without restrictions.

## Declarations

#### Ethics approval and consent to participate

The survey did not yield any discernible information, and ethical approval was obtained from the Ethics Committee of Istanbul Nişantaşı University (2024/01-SB) in accordance with the principles of the Declaration of Helsinki. Informed consent was obtained from all participants at the beginning of the survey.

#### **Consent for publication**

Not applicable.

#### Competing interests

The authors declare no competing interests.

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