

Validity and reliability of the Persian version of the Ageism Scale for Dental Students in Ahvaz Jundishapur University of Medical Sciences

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Abstract

Introduction: The proportion of the elderly population has increased in Iran, and considering the increasing burden of their referrals to receive dental services in the near future, determining dentists' attitudes towards ageism seems necessary. We aimed to determine the validity and reliability of the Ageism Scale for Dental Students (ASDS) in Persian users.

Material and methods: It was a descriptive cross-sectional study carried out among the fourth-year dental (clinical) students at Ahvaz University of Medical Sciences in 2022. The participants were selected using the census method. The research instruments included a demographic questionnaire and the ASDS. The collected data were analyzed by SPSS-V23 and Smart PLS software-V3.

Results: The mean age of participants was 24.74 years with a standard deviation of 6.01. The internal consistency (Cronbach's $\alpha = 0.712$) and intra-class correlation coefficient (ICC = 0.646) reliability of the translated questionnaire were within the acceptable range. The scale had appropriate face validity and content validity because the impact factor values were higher than 1.5 and its content validity index was higher than 0.79. After performing the exploratory factor analysis, five factors were identified, which explained 59.55% of the total variance.

Conclusions: Since the Persian version of the ASDS has appropriate levels of validity and reliability, it can be administered in the health evaluation checklist of Iranian elderly as one of the auxiliary tools to determine the ageism towards the elderly in dentistry.

Key words: validity and reliability, ageism, dentistry, elderly, Ahvaz.

Introduction

Population aging is one of the most impressive human achievements indicating sustainable development in human societies resulting from improved literacy, access to medical technologies, and reduced mortality. According to the World Health Organization (WHO), the world's elderly population has risen from 9.2% in 1990 to 11.7% in 2025 and is predicted to increase significantly to 21.1% (2 billion people) by

2050 (Mohammadi-Shahboulaghi *et al.* 2018). According to the statistical models, the elderly population in Iran is estimated to increase to 10.5% in 2025 and 21.7% in 2050 (Ardane *et al.* 2018). Therefore, the phenomenon of aging should be considered as a major challenge of the future to be addressed.

Along with the worldwide increase of the elderly population, the phenomenon of ageism has been proposed. The WHO defines ageism

as “stereotyping and discrimination against individuals or groups solely based on their age” (WHO 2020). In this regard, Butler believes that age discrimination not only is as important as racism but also can be considered as a major problem in the coming years because according to his theory, “not all of us turn black or white, but we all grow old” (Butler 1969). Unlike other forms of discrimination, such as sexism and racism, ageism against the elderly is socially acceptable, fully institutionalized, unrecognizable, and unchallenged (Officer *et al.* 2016). Ageism is prevalent in government agencies, families, health care systems, labor market, and media in various forms, such as negligence, early retirement, restrictions on receiving social services, stereotypes, and media misconceptions about the elderly. As a consequence of these factors, the seniors’ psychological and physical health is affected by social isolation (Sum *et al.* 2016). Negative attitudes and stereotypes about the senior usually represent them as sick, incapacitated, with a crooked and inappropriate appearance, affected with dementia and mental illness, useless to society, isolated, low-income, and depressed (Palmore 2014). Although older people are the largest group of recipients of health care services, negative attitudes toward them have been observed among the health care providers reflected in their treatment choices and decisions for the elderly (Ben-Harush *et al.* 2017).

This type of attitude in nurses and medical students has led to shorter and shallower conversations with less humor in dealing with the elderly (Eymard and Douglas 2012). A longitudinal study showed that the elderly who perceived age discrimination by the medical staff had a lower quality of life than others (Jackson *et al.* 2019). A 6-year study also found that the risk of heart disease, arthritis, diabetes, and depression was significantly higher in older people who experienced age discrimination (Jackson *et al.* 2019).

Ageism leads to the misconception that providing care to the elderly is not necessary and desirable. These negative and incorrect attitudes towards the elderly are deemed serious obstacles to the formulation of appropriate and effective policies for this age group (De Visschere *et al.* 2009).

Studies in different parts of the world indicate that dentists are no exception to ageism. They usually have little knowledge of physiological, pathological, and psychological changes in old age so that their lack of knowledge and information has decreased their willingness to work with seniors (Tahani *et al.* 2019).

Given the growing proportion of the elderly population in Iran and the resulted increasing burden of their referrals to receive dental services in the coming years, identifying the medical staff attitudes towards ageism against seniors is of paramount importance. The findings can pave the way for conducting educational interventions to provide appropriate and equitable health care services (Koch-Filho *et al.* 2017).

Numerous questionnaires have been developed and administered to assess and determine ageism as well as age discrimination attitudes and stereotypes against the elderly: Children’s Attitudes toward Older People (Mehri *et al.* 2020), the Aging Attitude Scale (Robinson and Howatson-Jones 2014), the Fraboni Scale of Ageism (Fraboni *et al.* 1990), the Perspectives on Caring for Older Patients Scale (Lucchetti *et al.* 2018), and the Maxwell-Sullivan Attitudes Scale (Burbank *et al.* 2018).

Recently, an age discrimination scale was designed for dental students, known as the ASDS by American and European geriatricians (Rucker *et al.* 2018). The validity and reliability of this scale have been confirmed by three studies in Brazil, the United States, and Greece (Kossioni *et al.* 2019; Rucker *et al.* 2020; Rucker *et al.* 2019). This scale contains 27 items related to geriatric dentistry, which should be answered based on a six-point Likert scale, ranging from *strongly disagree* (zero points) to *strongly agree* (6 points) (Rucker *et al.* 2018). The most important questions of this scale are related to the time-consuming work with the elderly, complexities of taking the patient’s history considering their comorbidities, rejection of the treatment plans by seniors, high costs of providing dental care at home, and inadequacy of spending such high costs with regard to the remaining lifespan of the elderly (Rucker *et al.* 2018).

To the best of our knowledge, the ASDS has not been validated in Persian. So, due to the increasing number of elderly persons in Iran and the increasing burden of their referrals to receive dental services, the present study aimed to evaluate the validity and reliability of the Persian version of the ASDS among the dental students of Ahvaz University of Medical Sciences.

Material and methods

The statistical population of this study consisted of all clinical dental students in Ahvaz University of Medical Sciences in 2020 selected using the census method. The sample size was estimated as 5-20 respondents per item of the

questionnaire based on the structural equation modeling approach. In this regard, many researchers consider that an average of 10 people would be sufficient per item. Since the number of items in the main tool is 27 items, the sample size was estimated as 270. The selected participants included all dental students who entered university in 2020. Inclusion criteria were studying in the dental school of Ahvaz University of Medical Sciences, being willing to participate in the study, and completing the informed consent form. Exclusion criteria included unwillingness to continue participating in the study or incomplete responses to the questionnaires. The research tools included demographic questionnaires and the ASDS designed by Ryan Rocker in 2018. The ASDS contains 27 items related to geriatric dentistry. All items should be answered on a six-point Likert scale ranging from *strongly disagree* (zero points) to *strongly agree* (6 points).

After obtaining formal permission from the scale developer, the ASDS was translated into Persian. Later, two professional English translators were asked to translate the Persian version back into English. The obtained translated versions were compared and revised by the researchers and the final version was approved.

In order to determine face validity of the translated scale, the impact score was calculated for readability of each question. To this end, a 5-point Likert scale was used for each item: *very strong* (5 points), *strong* (4 points), *moderate* (3 points), *poor* (2 points), and *very poor* (1 point). Later, 10 dental students were asked to read and examine the translated items and determine their validity and clarity based on the developed Likert scale. Face validity of the Persian version of the questionnaire was calculated using the item impact method (impact score = frequency (%) × importance). Impact scores greater than 1.5 were considered appropriate.

To determine the content validity index (CVI), a panel of experts, including several experts and professors in the field of geriatrics, was asked to review the scale meticulously and write their revisions in detail with regard to the relevance, simplicity, and clarity of the translated items. As a result, the revisions recommended by experts were evaluated and finalized by the research team and the required changes were applied in the questionnaire. The content validity index was calculated using the CVI formula (ratio of the number of evaluators who rated an item with a score of 3 or 4 divided by the total number of evaluators). Scores higher than 0.79 indicate

appropriateness of the questionnaire, a score within the range of 0.70 to 0.79 shows that the item needs revision, and scores lower than 0.70 are unacceptable.

Given that ensuring sufficiency of the sample size is necessary for using the factor analysis method and determining construct validity of the translated scale, the sample adequacy index developed by Kaiser, Meyer and Olkin (KMO) was applied, which should be higher than 0.7. Exploratory factor analysis was also performed with varimax rotation. Moreover, eigenvalues of greater than one and pebble curves were used to extract the factors. Considering that the minimum factor load was 0.5, items with a factor load of less than 0.5 were removed. Finally, factors that played the most important role in explaining variance of the data were extracted as effective factors. Construct validity of the questionnaire was re-evaluated and confirmatory factor analysis was performed by collecting opinions of the study participants *via* Smart PLS software version 3.

In order to observe ethical considerations, the participants were ensured about confidentiality and anonymity of their information. To this end, all questionnaires were coded. The Ethics Code of the present study is IR.AJUMS REC.1399.415.

Results

The mean age of participants was 24.74 years with a standard deviation of 6.01 years. Of all participants, 174 (64.7%) were women; 88 (32.7%) and 78 (29%) students entered university in 2015 and 2016, respectively; 38 (51.3%) of the participants lived with their parents; 58 (21.6%) stated that they had elderly parents; and 246 (91.4%) had passed the geriatrics course.

The findings corroborated appropriate face (impact factor = higher than 1.5) and content (impact factor = higher than 0.79) validity of the translated questionnaire (Table 1).

Reliability of the translated questionnaire was confirmed using internal consistency (Cronbach's $\alpha = 0.712$) and ICC of 0.646 (Table 2).

Prior to application of the factor analysis method, sufficiency of the sample size was corroborated for exploratory factor analysis by calculating the sample adequacy index (Table 3).

According to Table 3, the KMO statistic value is 0.70, showing that the data are suitable for exploratory factor analysis. Furthermore, results of the Bartlett sphericity test are also significant, confirming a significant correlation between the variables.

Table 1. CVR and CVI of Ageism Scale for Dental Students (ASDS) questionnaire

Items of Ageism Scale for Dental Students (ASDS)	CVI	CVR	Impact score
1. Research funding should be allocated to the treatment of pediatric rather than treatment of the elderly.	1	0.8	2.16
2. Taking medical history from the elderly is usually time consuming.	0.8	0.7	3.04
3. Taking medical history from the elderly is usually complicated.	0.6	0.7	2.16
4. I prefer treating the elderly than young people.	0.6	0.9	2.59
5. I pay more attention to young patients than senior ones.	0.8	0.8	1.9
6. Generally, elderly people help the community a lot.	1	0.9	2.66
7. Elderly patients are more comfortable in a nursing home.	0.8	7/0	2.282
8. Elderly patients are more receptive to dental care services than younger patients.	1	0.1	2.59
9. Elderly patients often do not accept the treatment plans.	0.8	0.7	2.73
10. Elderly patients have solid ideas about dental treatment.	1	0.9	3.28
11. I have more compassion for elderly patients than younger ones.	0.8	0.1	3.87
12. My treatment plan for elderly patients is consistent with that of my young patients.	1	0.9	3.52
13. Older people do not take good care of their teeth.	0.8	0.9	3.6
14. Elderly patients usually do not follow dental advice.	1	0.8	3.96
15. The government has a responsibility to provide dental care for the elderly.	0.8	0.9	3.78
16. Elderly patients do not live long enough to spend their time and effort on huge dentistry costs.	1	0.8	2.52
17. Elderly patients do not live long enough to be worth investment of cheap dental treatment.	0.8	0.9	3.78
18. Dental treatment of elderly patients is very time consuming.	0.8	0.7	2.78
19. Providing out-of-office dental care for elderly paralyzed patients is very expensive.	1	0.9	3.6
20. The cost of dental treatments is a major obstacle for many elderly patients seeking dental care.	0.8	0.8	3.87
21. Dental treatment is usually successful in elderly patients.	0.8	1	4
22. The number of my elderly patients has been sufficient.	0.8	0.7	4.05
23. Having oral problems is normal for the elderly.	0.8	0.8	4.4
24. If I receive more training, I can provide home care dental treatment in a nursing home.	0.8	0.7	4.6
25. Elderly patients should be trained by someone who has been educated in elderly dentistry.	0.8	0.8	3.87
26. I feel comfortable treating some people with long lists of drugs.	0.8	0.9	3.69
27. In treatment planning for the elderly, I prefer tooth extraction over extensive restorative procedures.	1	0.7	3.04

Table 2. Reliability of ASDS by Cronbach's α and ICC index

Variables			
Internal consistency reliability (Cronbach's α)		0.740	
ICC	95% confidence interval for ICC		P-value
	Higher bound	lower bound	
0.646	0.719	0.556	< 0.0001

Table 3. Determination of KMO statistics and Bartlett sphericity test results

Variables		
Sample adequacy index KMO		0.708
Bartlett's test	Approx. chi-square	723.765
	Degree of freedom	105
	P-value	< 0.0001

Exploratory factor analysis was performed by varimax rotation. The eigenvalue of greater than one and the pebble curves were used to extract the factors. The minimum factor load was considered as 0.5 and items with a factor load of less than 0.5 were removed. As a result, five factors were extracted, which explained 59.55% of the total variance.

Table 4 represents the contribution of variables in the factors after rotation. Each variable was attributed to its factor based on high correlation coefficients.

In order to evaluate construct validity of the questionnaire, all participants were required to confirm 15 questions of the questionnaire related to five factors of the confirmatory factor analysis. As a result, 13 questions were confirmed and two questions (questions 5 and 27) were removed from the items due to their lowest factor loadings (Fig. 1).

Discussion

Based on the findings, the Persian version of the ASDS has desirable levels of reliability and validity. The CVI and content validity ratio (CVR) values were obtained at an acceptable level. Followed by exploratory factor analysis, five factors were identified, which explained

Table 4. Factor coefficients of the subscales extracted from exploratory factor analysis

Item number	Impact factor				
	1	2	3	4	5
17	0.796				
16	0.789				
1	0.642				
5	0.445				
20		0.787			
23		0.654			
19		0.645			
14			0.861		
13			0.841		
9				0.640	
18				0.633	
10				0.611	
27				0.551	
3					0.857
2					0.802

59.55% of the total variance. The ICC of 0.64 and Cronbach's α of 0.74 confirmed appropriate reliability of this scale. These results are consistent with other studies conducted on this scale by Ryan Rucker and Anastassia E. Kossioni in

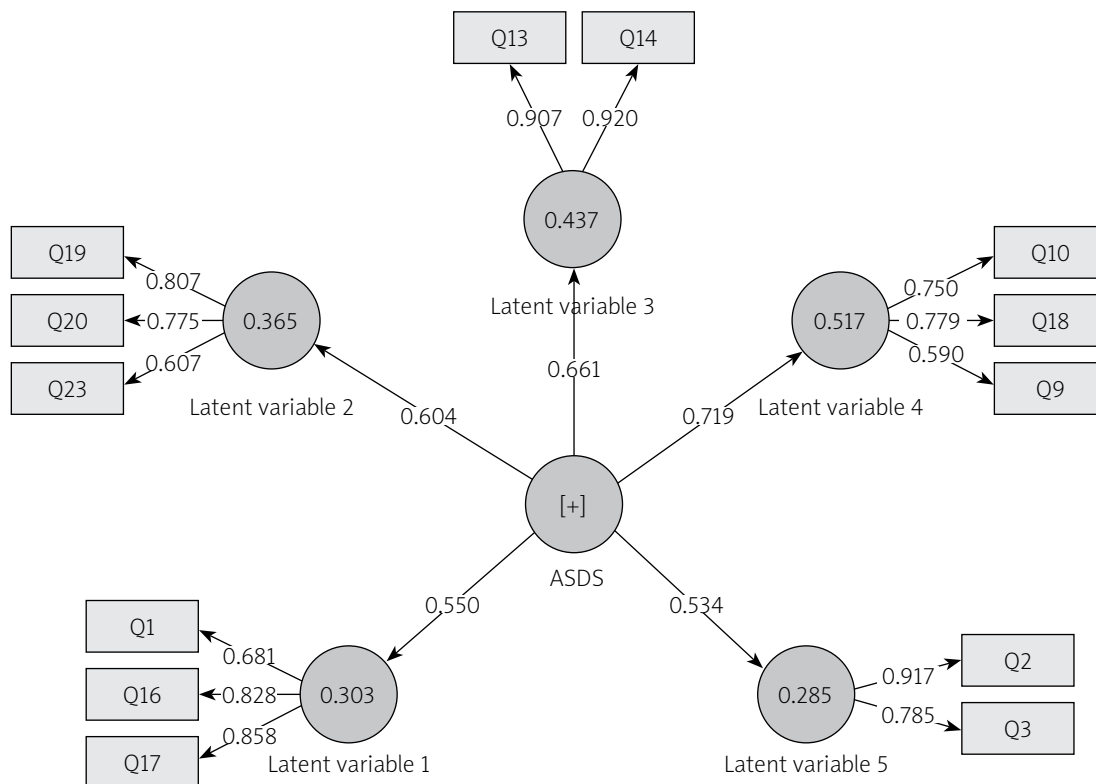


Fig. 1. Measurement model for confirmatory factor analysis of five factors extracted from the age discrimination questionnaire

the United States, Brazil, and Greece (Kossioni *et al.* 2019; Rucker *et al.* 2020; Rucker *et al.* 2019). In these studies, one to five factors were determined that predicted 51% to 63% of the total variance. In this regard, the highest consistency in the findings was associated with the study by Ryan Rucker in the United States (Kossioni *et al.* 2019). Their estimated Cronbach's α coefficient was completely consistent with our findings. Considering that the appropriate value for Cronbach's α is 0.7 (Cronbach 1951), for combined reliability it is 0.7 (Nunnally 1978), and for the average variance extracted it is 0.5 (Fornell and Larcker 1981), our findings confirmed appropriate reliability and validity of the translated questionnaire concerning these variables.

Based on the findings, the method proposed by Fornell and Larcker (1981) shows that the average variance extracted root of the latent variables is greater than the correlation value between them. Therefore, it can be stated that the model constructs (hidden variables) have more interaction with their indices than with other constructs; in other words, the divergent validity of the model is appropriate.

Conclusions

Based on the findings, the Persian version of the ASDS has good levels of validity and reliability. So, it can be included in the health evaluation checklist of the Iranian seniors as an auxiliary tool in determining age discrimination against them.

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Statement of ethics

This study was part of a dissertation in the School of Dentistry with the ethics committee number IR.AJUMS.REC.1399.415 and was implemented with the support of Social Determinant of Health Research Center (Reference No. SDH-9920), Deputy of Research in Ahwaz Jundishapur University of Medical Sciences.

Disclosure

The authors declare no conflict of interest.

References

1. Ardane F, Ganjloo J, Mohammadi M. Health related quality of life (HRQOL) and socio-demographic determinant among elderly community of Sabzevar, 2017. *Specialty J Med Res Health Sci* 2018; 3: 1-8.
2. Ben-Harush A, Shiovitz-Ezra S, Doron I, et al. Ageism among physicians, nurses, and social workers: findings from a qualitative study. *Eur J Ageing* 2017; 14: 39-48.
3. Burbank PM, Burkholder GJ, Dugas J. Development of the Perspectives on Caring for Older Patients scale: Psychometric analyses. *Appl Nurs Res* 2018; 43: 98-104.
4. Butler RN. Age-ism: Another form of bigotry. *Gerontologist* 1969; 9: 243-246.
5. Cronbach LJ. Coefficient alpha and the internal structure of tests. *Psychometrika* 1951; 16: 297-334.
6. De Visschere L, Van Der Putten GJ, De Baat C, et al. The impact of undergraduate geriatric dental education on the attitudes of recently graduated dentists towards institutionalised elderly people. *Eur J Dent Educ* 2009; 13: 154-161.
7. Eymard AS, Douglas DH. Ageism among health care providers and interventions to improve their attitudes toward older adults: an integrative review. *J Gerontol Nurs* 2012; 38: 26-35.
8. Fornell C, Larcker DF. Evaluating structural equation models with unobservable variables and measurement error. *J Mark Res* 1981; 18: 39-50.
9. Fraboni M, Saltstone R, Hughes S. The Fraboni Scale of Ageism (FSA): An attempt at a more precise measure of ageism. *Canadian J Aging* 1990; 9: 56-66.
10. Jackson SE, Hackett RA, Steptoe A. Associations between age discrimination and health and wellbeing: cross-sectional and prospective analysis of the English Longitudinal Study of Ageing. *Lancet Public Health* 2019; 4: e200-e208.
11. Koch-Filho HR, Beiger LF, Mendes MA. Beliefs in relation to elderly between Dentistry undergraduates of private university of Parana. *RSBO Revista Sulrasileira de Odontologia* 2017; 14: 16-23.
12. Kossioni AE, Ioannidou K, Kalyva D, et al. Translation and validation of the Greek version of an ageism scale for dental students (ASDS_Gr). *Gerodontology* 2019; 36: 251-257.
13. Lucchetti AL, da S Ezequiel O, Moreira Almeida A, Lucchetti G. Measuring medical students' attitudes and knowledge about geriatrics and gerontology in Brazilian medical students: A comparison of instruments. *Australas J Ageing* 2018; 37: E74-E77.
14. Mehri S, Hosseini M, Fallahi-Khoshknab M, et al. Clarification of ageism in the care system. *Iranian J Ageing* 2020; 15: 14-27.
15. Mohammadi-Shahboulaghi F, Karbalaee Z, Zarghi A, et al. Lifestyle of the elderly and its predictive factors. *J Res Med Dent Sci* 2018; 6: 219-225.
16. Nunnally JC. *Psychometric theory*. 2nd ed. McGraw-Hill, New York 1978.
17. Officer A, Schneiders ML, Wu D, et al. Valuing older people: time for a global campaign to combat ageism. *Bull World Health Organ* 2016; 94: 710-710A.

18. Palmore EB. Research note: ageism in Canada and the United States. *J Cross Cultural Gerontol* 2004; 19: 41-46.
19. Robinson S, Howatson-Jones L. Children's views of older people. *J Res Childhood Educ* 2014; 28: 293-312.
20. Rucker R, Barlow PB, Fernandes dos Santos MB, Carrera Malhao E, et al. Translation and preliminary validation of an ageism scale for dental students in Brazil (ASDS-Braz). *Gerodontology* 2020; 37: 87-92.
21. Rucker R, Barlow PB, Hartshorn J, et al. Development and preliminary validation of an ageism scale for dental students. *Spec Care Dentist* 2018; 38: 31-35.
22. Rucker R, Barlow PB, Hartshorn J, et al. Dual institution validation of an ageism scale for dental students. *Spec Care Dentist* 2019; 39: 28-33.
23. Sum S, Emamian S, Sefidchian A. Aging educational program to reduce ageism: Intergenerational approach. *Elderly Health J* 2016; 2: 33-38.
24. Tahani B, Khademi A, Fathollahi S. Status of geriatric education and meeting the standards of facilities in dental schools. *J Educ Health Promot* 2019; 8: 163.
25. World Health Organization. Ageing and life-course, frequently. Asked questions: Ageism 2020. Available from: [/https://www.who.int/ageing/features/faq-ageism/en](https://www.who.int/ageing/features/faq-ageism/en)

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