

Knowledge, Attitudes, and Practices of General Dentists Towards Geriatric Dentistry in Saudi Arabia: A Cross-Sectional Study

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ABSTRACT

Background:

The need for specialised geriatric dental treatment has increased due to the global increase in the older population. However, a lack of experience and training in dentistry may make general dentists less equipped to treat elderly patients.

Objective:

To analyse the practices, attitudes, and understanding of geriatric dentistry of general dentists in Riyadh province, Saudi Arabia, as well as the factors that affect their preparedness to treat senior patients.

Methods:

A cross-sectional study was conducted among 240 general dentists with at least one year of experience who were selected through cluster and systematic random sampling. Data were collected from March to June 2025 via a validated self-administered questionnaire comprising four sections: demographics, knowledge (27 items), attitudes (17 items), and practices (7 items), along with a facility checklist. Descriptive statistics, t-tests, ANOVA, and Pearson correlation were used for analysis, with significance set at $P \leq 0.05$.

Results:

The majority of the participants were female (61.1%) and had 5–15 years of experience (42.5%). Dentists demonstrated moderate knowledge (mean scores: 12.2–14.2/30) and attitudes (50.2–57.3/85) toward geriatric dentistry. Only 6.1% preferred treating elderly patients, and 47.6% were willing to pursue further training. Surprisingly, dentists treating fewer elderly patients had higher knowledge scores ($P = 0.025$). A significant positive correlation existed between close grandparent relationships and attitude scores ($P = 0.015$), and a strong willingness to train was correlated with more favorable attitudes ($P < 0.001$). However, the overall correlations between knowledge, attitudes, and practices were weak.

Conclusion:

General dentists exhibit moderate readiness to manage elderly patients, with limited clinical exposure and interest. Enhancing geriatric content in dental curricula and promoting targeted continuing education are essential to improve the quality of care for the aging population.

1- INTRODUCTION

Health care has evolved in response to the aging population worldwide. All age groups are impacted by the so-called 'care crisis,' which is particularly noticeable in European countries. To address this, a more complex and efficient service design is needed (1). The predicted 65+ population will reach 1.4 billion by 2040, up from 506 million in 2008. A growing number of people in their later years are settling into emerging countries (2). A global demographic transition is occurring, resulting in a significant increase in the senior population. The population of senior individuals was 600 million in 2000, and projections indicate that this figure will quadruple by 2025 (3).

The rapid expansion of elderly demographics is attributable to advancements in healthcare and sanitation. Elderly individuals have a relatively high prevalence of chronic diseases (4). These include high blood pressure, heart disease, and diabetes. There is widespread agreement that the oral health of elderly individuals is poor and that they have high treatment needs (5, 6). Partially missing teeth, coexisting medical conditions, and polypharmacy complicate treatment more for the aging population, which is expected to constitute a greater proportion of dental care patients in the coming years. The WHO prioritises the senior population; hence, dentists must recognise and address the specific oral health requirements of this demographic (7).

Although the edentulism rate has decreased by 50–60% over the past two decades in industrialised nations, the incidence of caries and tooth loss has increased in poor countries (8). Approximately 52% of individuals over the age of 65 in Iran are edentulous. This figure reaches as high as 80% in certain provinces. Systemic diseases and drugs sometimes compound oral disorders in older adults, necessitating tailored preventive and therapeutic oral health treatments for this population. The dental personnel must possess specialised knowledge and skills to deliver suitable dental care (9). Nevertheless, research on dentists globally has revealed that their expertise is often inadequate (10). A survey indicated that approximately 20% of graduated dental students in Belgium felt inadequately prepared to care for elderly patients due to insufficient knowledge (11). Kuthy et al. reported that 37% of senior dentistry students indicated a reluctance to deliver dental care to elderly patients in their future careers (12).

Despite the global rise in the elderly population and the increasing complexity of their dental needs, few studies have explored the preparedness and competency of general dentists in Saudi Arabia in managing geriatric patients. In Saudi Arabia, recent census data suggest that individuals aged 60 years and above are steadily growing, prompting concerns about age-related chronic illnesses such as diabetes and cardiovascular disease—conditions with significant oral health implications (14–16). While international studies highlight insufficient training and declining interest among dental graduates in elderly care, data specific to Saudi dental practitioners remain scarce. Additionally, geriatric dentistry is not adequately integrated into Saudi dental curricula, and the extent of knowledge, attitudes, and practices (KAP) among practicing dentists remains underreported. This gap underscores the urgent need for national studies to inform educational reforms and improve elderly oral health services (13). This study examines general dentists' understanding of geriatric dentistry and their practices, highlighting a lack of knowledge about their preparedness to evaluate the dental care facilities needed for senior patients.

METHODOLOGY

This cross-sectional study used a validated self-administered questionnaire to gather detailed data on the target group. The design enables the assessment of certain variables at a single moment in time, which aids in the detection of relationships between aspects of interest. The study was carried out in compliance with ethical standards, following the principles described in the Helsinki Declaration to ensure the integrity and well-being of participants. Prior to participation, all participants were informed about the study's objectives and gave their informed consent, assuring transparency and respect for their autonomy.

Sampling

The study involved general dentists with at least one year of experience from dental clinics and private practices in Riyadh province, Saudi Arabia. Researchers determined the sample size via a formula for qualitative variables, establishing 5% types I error rate ($\alpha = 0.05$) and a precision of 5%. Previous research has indicated that 11% of participants exhibited proficient knowledge of geriatric dentistry [10]. The intended sample size attained was 240, following the use of an effect size of 1.5 for cluster sampling and consideration of potential sample attrition.

Data collection tools

The data were collected via a self-administered questionnaire. The survey comprised four segments: 1. Demographics: This section inquired about participants' age, sex, experience in treating elderly patients, and completion of a geriatric dentistry course.

The knowledge component had 27 true/false/do not know questions taken from the research conducted by Hatami et al. (3). The questionnaire segment derived from Hatami et al. (3) addressed themes such as oral aging, prevalent oral conditions, social dimensions of aging, and requisite care adjustments for elderly individuals. Scores varied from 0 to 30. Previous research confirmed the methodology's reliability and validity.

3. Attitude: Seventeen questions utilized a 5-point Likert scale for grading, with 1 denoting severe disagreement and 5 signifying strong agreement. The utilized items were derived from the validated Persian version of the Geriatric Attitude Scale, incorporating adjustments tailored to dental care requirements. 4. Practice: Seven measures were used to evaluate practitioners' perceived competencies in developing preventive and therapeutic strategies, as well as emergency management and communication skills. The assessment employed a 5-point Likert scale, with a score of 23 designated as the standard for good practice.

A checklist evaluated the availability of amenities for older patients, including ramps, lifts, appropriate flooring, and wheelchairs (12).

Procedure

Dentists obtained the questionnaires at the commencement of their workday and completed them on the same day. The survey administrators defined its objective and emphasised its voluntary and confidential nature to participants. The investigation necessitated that individuals furnish truthful responses autonomously. The sampling process continued until the requisite number of participants was attained.

Statistical analysis

The data were analysed via SPSS (Version 22.0). Descriptive statistical methods yielded summaries of demographic data alongside mean ratings for knowledge, attitudes, and practices. The research utilised Pearson correlation coefficients to assess the relationships among the knowledge levels, attitudes, age distributions, and professional experiences of the participants. T-tests and ANOVA were employed to examine score disparities depending on sex and additional variables, such as the frequency of older patient visits and the completion of geriatric courses. The criterion for statistical significance was set at P values less than or equal to 0.05, incorporating adjustments for multiple comparisons.

RESULTS

The current study undertaken aims to evaluate the knowledge, attitudes, and practices of dentists about geriatric patients. Table 1 presents the demographic information and professional characteristics of the dentists who participated in this study. Female participants constituted 61.1% of the study cohort, and male individuals accounted for 38.9%. The research indicates that women are becoming prevalent in dentistry professions. In terms of professional experience, the predominant cohort of dentists (42.5%) had between 5 and 15 years of experience, whereas 36.5% had fewer than 5 years of experience. Among the participating dentists, those with over 15 years of experience constituted the smallest cohort at 21.0%. Nevertheless, dentists attend to a comparatively small proportion of elderly patients (≥ 65 years old). The survey results indicate that 74% of the dental professionals said that their patient demographics included fewer than 15%, whereas only 8.7% treated elderly patients, comprising more than 30% of their practices. Over half of the survey respondents (53.5%) provided care for an elderly parent, whereas 44.4% had close relationships with their grandparents. The survey results indicate that 48.5% of the participants reported the demise of their grandparents. A majority of the dentists (61.9%) indicated a preference for serving patients aged 25--44 years. A minority of professionals (6.1%) indicated a preference for treating senior dental patients, reflecting a modest interest in geriatric dentistry. Furthermore, 47.6% of the dental practitioners expressed a readiness to engage in continuing education for elderly dentistry, whereas 27.2% exhibited no interest, and 8.7% showed significant reluctance. The data indicate that many dentists are hesitant to broaden their competence, yet some display a willingness to learn.

The analysis contrasts knowledge and attitude scores among various participant variables. Table 2 evaluates dentists' perceptions and attitudes towards geriatric dentistry on the basis of demographic and occupational characteristics. Dentists exhibited moderate understanding of geriatric dentistry, with mean knowledge scores ranging from 12.2 to 14.2 out of a possible score of 30. The statistical analysis revealed no significant difference in knowledge between male dentists (13.6 ± 2.9) and female dentists (13.4 ± 3.0), with a P value of 0.18.

- **Work experience:** Dentists with 15 or more years of experience attained the highest knowledge score of 14.2 ± 2.3 ; however, the advantage of experience was not statistically significant ($P = 0.21$). The knowledge scores of dentists treating fewer than 15% of senior patients (14.0 ± 2.5) were considerably higher than those of dentists treating a greater proportion of elderly patients (12.2 ± 3.6), with a statistically significant P value of 0.025.
- **Familial influence:** The knowledge level of dentists remained unchanged irrespective of their personal interactions with elderly parents or grandparents. The highest knowledge scores (14.2 ± 2.4) were recorded for dentists who were strongly willing to participate in geriatric training, whereas those with low or no willingness had knowledge scores of approximately 13.2, although this difference was statistically insignificant ($P = 0.32$).

Analysis of Attitude Scores.

The overall attitude ranged from 50.2 to 57.3 out of 85 points, indicating moderate enthusiasm for geriatric care. The study indicated no notable gender disparity in dentists' attitudes towards geriatric care, with male dentists averaging 55.2 ± 6.4 and female dentists averaging 56.0 ± 6.0 ($P = 0.31$).

- **Work Experience:** Dentists with more than 15 years of experience exhibited a marginal increase in attitude ratings to 57.0 ± 6.3 ; however, the statistical analysis revealed no significant difference ($P = 0.59$). Dentists who treated a smaller proportion of elderly patients exhibited more favorable attitudes (56.1 ± 6.3) than did those serving more than 30% of the elderly patients (53.4 ± 6.0), although this difference was not statistically significant ($P = 0.18$).

The attitude score among dentists with close links with their grandparents was 55.0 ± 5.9 , significantly surpassing the score of 53.6 ± 5.5 for those with remote relationships, with a P value of 0.015. The cohort of dentists who were strongly eager for geriatric training achieved significantly higher attitude scores (56.8 ± 6.0) than did their markedly reluctant counterparts, who presented the lowest scores (50.2 ± 5.1), as indicated by a highly significant P value of less than 0.001.

DISCUSSION

This cross-sectional study aimed to elucidate general dentists' perspectives on elderly dentistry and their associated practices. According to the survey's findings, 74% of dentists said that less than 15% of their patients were older, while just 8.7% of their practices—which accounted for more than 30% of all patients—treated senior patients. These findings reflect a similar trend reported by Khayat WF et al. (13), who noted the lack of emphasis on geriatric dentistry in Saudi dental curricula, possibly leading to lower patient volumes from this age group in clinical practice.

Over half of the survey respondents (53.5%) provided care for an elderly parent, whereas 44.4% had close relationships with their grandparents. The investigation revealed a weak positive correlation between dentists' knowledge and their attitudes towards patients, as well as between their attitudes and actual practices. Only 5% of the dentists expressed interest in treating elderly patients, as many believed that their dental education inadequately covered geriatric dentistry. A study by Ravisankar et al. (17) revealed a weak positive correlation between dentists' knowledge and attitudes (correlation coefficient 0.35) and a discernible weak positive relationship between their attitudes and practices ($R = 0.2$, P value 0.006), indicating minimal mutual influence. In accordance with these findings, Moreira et al. (18) reported that Brazilian dentists exhibit intermediate knowledge and attitudes regarding older patients.

We found that most participants had moderate knowledge and that only 10.8% had inadequate knowledge; this could be because the study used a variety of assessment items. Our survey findings indicate that many dentists deemed their dental school curriculum inadequate. Alaei and his associates conducted the study. Alaei et al. (19) reported that 88.5% of dentists possessed inadequate understanding regarding geriatric dentistry, whereas only 11.5% demonstrated moderate expertise. A study investigating Saudi dental schools (19) corroborates these concerns by demonstrating that the instructional duration allocated to geriatric dentistry is inadequate. Eight out of the 11 main schools established more than six years ago offered geriatric dental education modules. All the institutions provided training hours; however, only 12.5% conducted seminars and lectures, whereas 50% offered clinical instruction in geriatric dentistry.

Research indicates that academic education approaches can effectively impart knowledge regarding aging but do not establish a direct correlation between knowledge acquisition and changes in attitudes. The research delineated three classifications of association coefficients: weak (<0.35), moderate (0.36–0.67), and strong (0.68–1.0) (20). The study revealed a weak but substantial correlation between knowledge and attitudes. Educational institutions have implemented various interventions to enhance attitudes toward older adults through aging-awareness training and multimodal approaches, including lectures, PBL activities, simulations, mentorship, and senior mentoring programs (20, 21).

In the current study, dentists with 15 or more years of experience attained the highest knowledge score of 14.2 ± 2.3 ; nevertheless, the advantage of experience was not statistically significant ($P = 0.21$). The study by Tahani et al. (22) revealed no significant link between dentists' knowledge scores and their years of work experience, as the mean knowledge score for those with 15 years or more was 14.2 ± 2.3 , with a statistically insignificant difference ($P = 0.21$). Giselle et al. (23) reported that participants with 15 or more years of work experience achieved a higher knowledge score than did students ($p=0.003$), although they did not specify a score of 14.2 ± 2.3 or a significance of $p=0.21$. The current study revealed that dentists with a strong willingness to participate in geriatric training achieved the highest knowledge scores (14.2 ± 2.4), whereas those with low or no willingness had scores of approximately 13.2, although this difference was statistically insignificant ($P = 0.32$). Abdelrahim et al. (24) reported that dentists with over five years of experience presented markedly superior knowledge scores, indicating that continuous education and exposure augment comprehension. Similarly, Rajeh MT et al. (25) conducted a study in Riyadh that revealed significant gaps in general dentists' preparedness and confidence when treating elderly patients, with only 27% having received any formal training in geriatric dentistry. The study emphasised the urgent need for structured geriatric modules and continuing professional development (CPD) programs tailored to the needs of the Saudi aging population. These findings support the conclusion of the present study that curricular and professional reforms are essential to meet the oral health needs of an increasingly elderly society in Saudi Arabia.

Various strategies must be evaluated to improve dental care accessibility for elderly individuals. Strategies to increase dental care accessibility for older persons include individual initiatives, such as promoting dental visits, and systemic enhancements, such as cost reductions and patient education, alongside social activities aimed at alleviating senior isolation. Systemic and social interventions are more effective than individual activities in improving access to dental care for the senior population.

This study is subject to certain limitations. First, its cross-sectional design restricts causal inferences regarding the relationships between knowledge, attitudes, and practices of general dentists toward geriatric care. Second, the reliance on self-reported data may introduce social desirability and recall bias, potentially affecting the accuracy of responses. Lastly, the study was conducted in a single region (Riyadh), which may limit the generalizability of findings to other regions of Saudi Arabia.

CONCLUSION

In conclusion, this study highlights a moderate level of knowledge and attitudes among general dentists in Riyadh province, Saudi Arabia, regarding geriatric dentistry, with limited practical engagement in the care of elderly patients. Despite the growing need for specialised dental care due to the global aging population, most dentists reported minimal exposure to elderly patients and a preference for younger demographics, reflecting educational and systemic gaps. While personal relationships with older adults and a willingness to pursue geriatric training were associated with slightly improved attitudes and knowledge, these associations were generally weak. These findings emphasize the urgent need to enhance dental curricula and continuing education programs focused on geriatric care, integrate more clinical exposure to elderly patients, and implement systemic strategies to improve dental care accessibility for the aging population.

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Table 1: Demographic distribution of the study participants

Characteristic		Frequency	Percentage
Gender	Male	90	38.9
	Female	141	61.1
Time of Graduation	< 5 years	58	36.5
	5 to 15 years	67	42.5
	Over 15 years	33	21
Patients Over 65 Years	< 15%	118	73.8
	15 to 30%	28	17.5
	> 30%	14	8.7
Willingness to Attend Training Courses	Highly Willing	35	15.2
	Almost Willing	110	47.6
	Almost Unwilling	64	27.2
	Highly Unwilling	20	8.7

Table 2: Comparison of Mean Knowledge and attitude score with Demographic characteristicthe mean knowledge and attitudes scores with demographic characteristics

Characteristic		Mean Knowledge ± SD	P Value (Knowledge)	Mean Attitude ± SD	P Value (Attitude)
Gender	Male	13.6 ± 2.9	0.18	55.2 ± 6.4	0.31
	Female	13.4 ± 3.0		56.0 ± 6.0	
Time of Graduation	< 5 years	14.0 ± 2.6	0.21	55.9 ± 5.6	0.59
	5 to 15 years	13.5 ± 3.0		55.7 ± 6.5	
	Over 15 years	14.2 ± 2.3		57.0 ± 6.3	
Patients Over 65 Years	< 15%	14.0 ± 2.5	0.025	56.1 ± 6.3	0.18
	15 to 30%	13.0 ± 3.4		54.6 ± 6.7	
	> 30%	12.2 ± 3.6		53.4 ± 6.0	
Willingness to Attend Training Courses	Highly Willing	13.3 ± 2.4	0.32	50.2 ± 5.1	<0.001
	Almost Willing	13.2 ± 2.6		53.8 ± 6.4	
	Almost Unwilling	13.3 ± 3.1		57.4 ± 5.4	
	Highly Unwilling	14.2 ± 2.4		56.8 ± 6.0	