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Comprehensive evaluation of knowledge and perceptions regarding geriatric dentistry among Saudi Arabian dental students

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ABSTRACT

Objectives: The purpose of this study was to evaluate the knowledge and perceptions of Arabian dental students on geriatric dentistry.

Materials and Methods: A cross-sectional survey was conducted with a total of 100 participants belonging to Group I (25 each from third- and fourth-year students) and Group II (50 fifth-year students and interns). All participants had completed a three-part questionnaire related to geriatric dentistry: Part I (knowledge), Part II (cognitive evaluation), and Part III (awareness and attitude of psychosocial and health problems). Comparisons were made between the groups, and the data were analyzed using SPSS software.

Results: The responses on the Part I were not statistically significant among the groups ($P > 0.05$). The knowledge mean scores comparison showed an evident significant relationship among the groups ($P < 0.05$). Overall the Group II participants achieved the highest scores for all the Parts (all $P > 0.05$).

Conclusions: The students belong to Group II, and the interns achieved higher scores than the Group I students. Dental students and interns in Saudi Arabia lack positive approaches in providing primary health care to geriatric individuals despite a rapidly growing geriatric population.

Keywords: *dental education; dental students; geriatric dentistry; geriatric education.*

INTRODUCTION

Improvement in the general health status in a growing population has shown a significant geriatric

population reaching an advanced age. The development of new medications and treatments, advancements in medical knowledge, improved hygiene, better nutrition, and improved working conditions.¹

This change in health status is most clearly visible in developing countries where an increase in the geriatric population and absolute numbers are noticed.^{1,2} It has been reported that the number of people of age 60 years is expected to increase from 600 million to 2 billion globally by 2050.³ In Saudi Arabia, the population over the age of 60 years has escalated recently.⁴ This demographic shift is because of a rapid escalation in the aging of the population. These individuals require necessary dental and medical services at an age when they can least endure and afford them. A widespread occurrence of prejudice towards geriatric adults in society is reported.⁵ Studies have also shown that communal stereotypes of geriatric people generally depict being undesirable.^{5,6} This mindset is particularly prevalent among young- and middle-aged persons.

Geiger⁷ reported that many forthcoming student professionals exhibit misunderstandings and misconceptions regarding the aged people and aging processes. As a result, many graduates have minimal or no knowledge of basic facts regarding geriatrics and indicate a slight preference towards working with the geriatric population.⁸ This lack of knowledge can result in detrimental consequences for delivering oral health care services to this population.⁹ Previous studies have reported the need for adequate levels of knowledge and efforts to meet the needs of the geriatric population can be beneficial for their health improvement.¹⁰ An American survey demonstrated that 20% of dental graduates indicated that they were ill-prepared to provide health care services to geriatric patient's comprehensively.¹¹ There are 24 dental schools (18 public and six private) in the Kingdom of Saudi Arabia. Nevertheless, none of the studies to date have focused on dental students' opinions on the oral health care of geriatric populations in Saudi Arabia. Therefore, there is a need to develop a new curriculum for dental students in Saudi Arabia to manage the geriatric population with dental needs. This study aimed to evaluate the knowledge and perceptions of dental students on geriatric dentistry in Saudi Arabia.

MATERIALS AND METHODS

This descriptive cross-sectional study design selected samples using a convenience sampling technique among all the students attending the College of dentistry, Majmaah University, Saudi Arabia. A total of 100 participants (Group I: 25 students each from the third- and fourth year and Group II: 50 fifth-year students and interns were involved in the study in the survey. This convenient sample involved entire students in the college. All participants students were asked to complete a three-part questionnaire: Part I of the questionnaire included questions on basic knowledge of geriatric patients (16 questions), Part II was based on cognitive evaluations of clinical conditions specific to geriatric patients (24 questions), and Part III (A and B) included awareness of psychosocial and health problems, their experience, and situational stresses that influence geriatric adults oral health (Part IIIA and Part IIIB contained 15 and 8 questions, respectively). This questionnaire was sourced from Fabiano et al.¹² with minimal modifications to test the clinical skills and suit the Saudi Arabian context. The study was conducted in accordance with the World Medical Association Declaration of Helsinki and approved by the Ethics Committee of Majmaah University, Majmaah, Saudi Arabia. The present study used a descriptive-analytical survey of the cross-sectional design. The questionnaire was evaluated by two external evaluators who had more than fifteen years of experience. The questionnaire content was approved as satisfactory, and it was determined that all questions were understandable. Part, I and II of the questionnaire scores, were based on the percentage of correct answers (correct, incorrect, and do not know). For Part IIIA, the scores were based on the influence of psychosocial factors on the geriatric patient (minor influence, major influence, and no influence), and Part IIIB reflected the student's perception of missing dental appointments (true, false, and do not know). The response

scores were divided into three groups high (>60%), medium (30–60%), and low (<30%). Group I and Group II responses were compared to assess and evaluate cognitive reasoning of clinical conditions in old age, factors affecting psychosocial issues, and situations influencing oral health in geriatric patients. The mean knowledge scores were compared using the student t-test. The chi-square test was used to compare the percentages of responses for each question. The information obtained was analyzed using IBM Corp. (SPSS Statistics for Windows, Version 21.0. Armonk, NY, USA).

RESULTS

A 100% response rate was received in the present cross-sectional study. A comparison of Group I and Group II responses did not reveal statistically significant differences in the Part I questionnaire (chi-square = 4.3999; $P > 0.05$). The part II questionnaire's cognitive evaluation among Group I and II showed a statistically significant difference (chi-square = 15.4042; $P = .008$), as shown in Figure 1. Overall scores for Groups I and II were obtained from all the parts of the questionnaire. Part I of the questionnaire reflected issues surrounding general knowledge regarding aging. Items on height decline and chronic illness demonstrated high levels of correct responses by Group I student's responses (Table 1). The remaining percentages of correct responses were below 50%, and the average of correct answers for Group I students was 39.8%. Group II students provided a higher level of correct answers in Part I for items like chronic illness, the decline in height, life expectancy, old age activities (Table 1). The remaining items showed moderate correct response levels; none of the items on Part I of the questionnaire obtained a low percentage of right responses. On the other hand, 51.9% was an average correct response for Group II students. It indicated that Group II students demonstrated considerably higher and broader relevant knowledge levels than Group I students. The knowledge mean scores

were compared using the student t-test between the two groups (Figure 1). The descriptive analysis of knowledge means scores among the groups. Group II (8.42 ± 2.91) showed higher mean scores than Group I (6.52 ± 3.12), and a statistically significant relationship was found among them ($P < 0.05$).

The details of the knowledge mean scores and median values are summarized in Table 2. There were no high levels of favorable responses in Part II by Group I students. All the responses were moderate-to-low in percentage, with an average of 30.8% correct responses. High levels of correct responses in Group II included items questioning issues such as difficulty in locating canals and the inability to keep the mouth open for a long time while performing a root canal treatment, presence of atrophied ridges, preexisting systemic disease, bone quality, irrigation protocols, and speed of bone-cutting affecting dental implants (Table 3). The average percentage of correct answers for Group II students answering Part II of the questionnaire was 55.5%. Part IIIA included questions about the perception of the psychosocial and health problems that geriatric dental patients may experience (Table 4). Group I students' responses showed an overall percentage of only 36.8% regarding "major influences" for various psychosocial factors affecting older adults' oral health.

In comparison, the Group II students responded with a correct overall percentage of 56.4% regarding identifying the same factors' primary influences. The Part IIIB questionnaire discussed the eight issues perceived by the dental graduates to prevent geriatric people from honoring appointments, and items were ranked to select the problems (Table 5). The top three barrier responses identified by the geriatric populations in Group I, included unimportant oral health care, transportation problems, and financial issues. Those in Group II students showed as failing to understand the importance of keeping appointments, not believing that dental care is a priority, and not caring about their oral health.

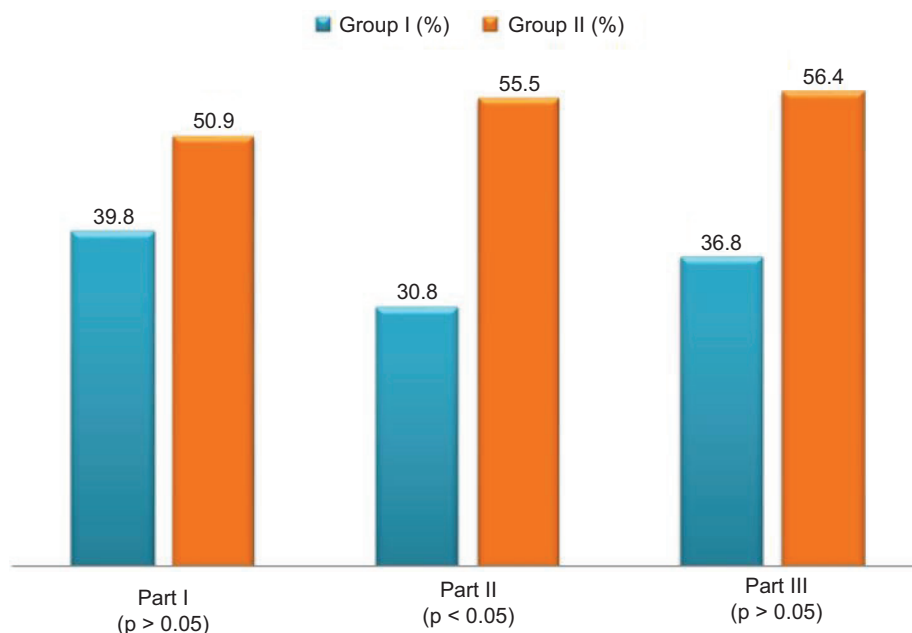


FIGURE 1. Comparison of mean knowledge scores between the two groups.

DISCUSSION

Dental students in Saudi Arabia engage in 6 years of dental curriculum content and training designed to provide education and socialization in the profession. The educational experience has an inherent potential for influencing the existing attitudes that the students have toward the growing numbers of geriatric patients. This study was designed to explore undergraduate dental students' general attitudes to geriatric people in three dimensions: (1) basic knowledge of aging; (2) cognitive evaluation of clinical conditions and psychosocial factors influencing oral health; and (3) dental students' perceptions of the reasons why geriatric patients do not keep appointments. The questionnaire was used to evaluate the geriatric oral health knowledge in health-related professions^{13,14} and modified for the Saudi Arabian context. Part I questionnaire's findings showed low correct response rates for Group I and II students and interns regarding essential issues such as general knowledge regarding aging, health status, and age-associated illnesses being a cause

of concerns. No statistically significant finding was obtained in this study. It was surprising that the students lacked a positive attitude towards the geriatric and exhibited relatively low general knowledge regarding this population's wellbeing. These findings were in agreement with a South Indian study.¹⁵ The results of Part II of the questionnaire indicated that students' accurate level of understanding of the geriatric patients' cognitive evaluations was 30% for Group I and 55% for Group II students, respectively. This difference was statistically significant among both the student groups. The low levels of accurate responses in terms of cognitive evaluation in Group I students can be attributed to the fact that there is no theoretical and clinical knowledge on geriatric dentistry in the third and fourth years of the dental education programs. The moderate levels of cognitive knowledge in Group II students can be attributed to a theoretical course on geriatrics for the fifth-year dental students. The authors believe that the present study is the first to perform cognitive knowledge of geriatric dental problems in dental students.

TABLE 1. Comparison of Knowledge Scores among the Geriatric Population.

No.	Questionnaire (Part I)	Group I	Group II	P value
1	A person's height tends to decline in old age.	68%	70%	0.75
2	Adults older than 65 years tend to have chronic illnesses that limit their activity compared with younger persons.	68%	84%	0.17
3	Geriatric persons have more acute symptoms than persons younger than 65 years	36%	38%	0.27
4	Geriatric persons have more injuries at home than persons below 65 years	46%	56%	0.59
5	Geriatric workers have less absenteeism than younger workers.	38%	48%	0.54
6	The life expectancy of men at the age of 65 is about the same as women.	48%	64%	0.25
7	Medical insurance cover, oral health care, rehabilitation, and expenses for a person older than 65 years of age.	26%	48%	0.03*
8	The aged have higher rates of criminal victimization than those below 65 years.	42%	46%	0.25
9	The aged are more fearful of crime than the people younger than 65 years.	44%	48%	0.06
10	The aged are more law-abiding of all adult groups.	38%	56%	0.00*
11	Decision making ability decline after the age of 65 years.	34%	32%	0.17
12	Participation in voluntary organizations (religious institutions and social activities) tends to increase with age.	28%	44%	0.12
13	The majority of aged live alone.	40%	42%	0.34
14	The rate of poverty among aged in Saudi is higher than younger group.	34%	50%	0.03*
15	Geriatric persons who reduce their activities tend to be happier than those who remain active.	36%	62%	0.00*
16	When the last child leaves home, majority of the parents have serious problems adjusting with their 'empty ness.'	30%	54%	0.05

Group I, third-and fourth-year students; Group II, fifth-year students and interns.

TABLE 2. Comparison of Knowledge Mean Scores Achieved by Both Groups.

Group	N	Mean	Median	SD	Mean difference	95% Confidence Interval		P value
						Lower	Upper	
Group I	50	6.52	6.0	3.12	-1.86	-3.06	-0.662	0.003*
Group II	50	8.42	9.0	2.91				

N, number of subjects; Group I, third-and fourth-year students; Group II, fifth-year students and interns.

* Significant.

TABLE 3. Comparison of Cognitive Scores among the Groups.

No.	Questionnaire (Part II)	Group I	Group II	P value
1	Is the presence of a small pulp chambers the prime difficulty a dentist encounters while performing root canal treatment in geriatric patients?	56%	76%	0.06
2	Are difficulties in locating canals the major problem a dentist encounters while performing the root canal treatment in geriatric patients?	44%	84%	0.00*
3	Is the existence of narrow root canals a significant difficulty encountered by the dentist while performing root canal treatment in geriatric patients	30%	56%	0.00*
4	Are more chances of having pulp stones the crucial difficulty encountered by the dentist while performing root canal treatment in geriatric patients?	38%	58%	0.00*
5	Is the inability to keep the mouth open for a long time the pivotal difficulty a dentist encounters while performing root canal treatment in geriatric patients?	38%	64%	0.00*
6	Can the presence of atrophied residual ridges affect the placement of dental implants in geriatric patients.?	44%	78%	0.00*
7	Can the presence of decreased bone quality affect the placement of dental implants in geriatric patients?	46%	74%	0.00*
8	Can the presence of pre-existing systemic disease affect the placement of dental implants in geriatric patients?	32%	78%	0.00*
9	Can the presence of neuromuscular canals close to the crest of the ridge affect the placement of dental implants in geriatric patients?	20%	52%	0.00*
10	Can the presence of maxillary sinus close to the ridge affect the placement of dental implants in geriatric patients?	24%	56%	0.00*
11	Can the speed of bone-cutting be considered an intraoperative factor affecting the outcome of dental implants in geriatric patients?	32%	60%	0.00*
12	Is torque of bone-cutting considered an intraoperative factor that can affect the outcome of dental implants in geriatric patients?	22%	44%	0.00*
13	Is irrigation protocol considered an intraoperative factor that can affect the outcome of dental implants in geriatric patients?	24%	62%	0.00*
14	Is progressive loading considered an intraoperative factor that can affect the outcome of dental implants in geriatric patients?	16%	56%	0.00*
15	Can immediate loading be a better option than progressive in the elderly, considered an intraoperative factor that can affect the outcome of dental implants in geriatric patients?	22%	36%	
16	Is recording jaw relation for complete denture construction difficult in a geriatric patient with a neuromuscular disorder?	24%	58%	0.00*
17	Is impression making for complete denture construction difficult in a geriatric patient with neuromuscular disease?	26%	44%	0.00*
18	Is border molding for complete denture construction difficult in geriatric patients with neuromuscular disorder?	26%	34%	0.04*

(continues)

TABLE 3. *Continued*

No.	Questionnaire (Part II)	Group I	Group II	P value
19	Is teeth arrangement procedure for complete denture construction difficult in a geriatric patient with a neuromuscular disorder?	28%	38%	0.00*
20	Is denture insertion procedure for complete denture construction difficult in a geriatric patient with a neuromuscular disorder?	40%	62%	0.04*
21	A geriatric patient is considered for RPD with periodontally healthy 11, 21 and canines 13, 23 in the maxillary arch. Is extraction of the remaining central incisors and going for overdentures on canines will be the ideal treatment plan for this case?	16%	34%	0.00*
22	A geriatric patient is considered for RPD with periodontally healthy 11, 21 and canines 13, 23 in the maxillary arch. Is fixed bridge for laterals and RPD for missing posteriors the ideal treatment plan for this case?	32%	38%	0.00*
23	A geriatric patient is considered for RPD with periodontally healthy 11, 21 and canines 13, 23 in the maxillary arch. Is cast partial RPD for all missing teeth will be the ideal treatment plan for this case?	26%	44%	0.01*
24	A geriatric patient is considered for RPD with periodontally healthy 11, 21 and canines 13, 23 in the maxillary arch. Is precision attachment retained RPD the ideal treatment plan for this case?	34%	46%	0.05

Broder and Block¹⁶ found significant improvements in the pre- to post test scores conducted for dental students immediately following a geriatric course. But a significant decline was seen about a year after the course's completion. The present study also revealed marked improvement in knowledge after introducing a geriatric course for Group II students, but this knowledge was below <60% and could not be considered satisfactory. It is important to note that undergraduate dental students are under immense pressure to maximize patient contact and meet the educational goals and clinical requirements necessary for graduation.¹⁷ This component is particularly relevant during the third to the fifth year of the dental curriculum. As a result, these dental students may develop a negative attitude towards patients with psychosocial issues, which prevents them from scheduling appointments and undergoing planned treatments. The question which must be raised is: "Is our dental education process itself a major factor in our students' development of negative bias towards the geriatric population?"¹² Even in the present study, practical knowledge mean

scores were evident; while the Group I students achieved low scores, the Group II students achieved high scores. The findings were statistically significant. There is minimal exposure of geriatric patients and knowledge on geriatric oral health to higher class students. Overall, a need to improve the clinical and theoretical knowledge on the management of oral health issues in the geriatric population was evident in the study. Nochajski et al.¹⁸ opined that future studies should target attitudinal aspects of dental education regarding the geriatric population and address methods to improve the educational processes to enhance positive attitudes and problem-solving bio-psychosocial issues. Furthermore, Wen and et al.¹⁹ opined that their study's qualitative comments confirmed the positive impact of learning interprofessional core competencies on geriatric health problems.

Our results were consistent with other published research, which found that educational courses can improve knowledge but have little impact on general attitudes toward geriatric dental care.²⁰⁻²² It has been reported that integrating geriatric education

TABLE 4. Comparison of Scores for Factors Influencing Oral Health in the Geriatric Population among the Groups.

No.	Questionnaire (Part IIIA)	Group I	Group II	P value
1	How much influence does social isolation have on the oral health of a geriatric population?	38%	56%	0.19
2	How much influence does change in eating habits have on the oral health of the geriatric population?	38%	76%	
3	How much influence does the ability to walk independently have on the oral health of the geriatric population?	32%	44%	0.41
4	How much influence does being independent at home have on the oral health of the geriatric population?	36%	52%	0.26
5	How much influence does a serious or life-threatening illness have on the oral health of the geriatric population?	32%	64%	0.01*
6	How much influence does being in an abusive relationship have on the oral health of the geriatric population?	42%	56%	0.21
7	How much influence do systemic disease and medication have on the oral health of the geriatric population?	44%	70%	0.02*
8	How much influence do psychological factors influencing prosthodontics treatment have on the oral health of the geriatric population?	38%	58%	0.10
9	How much influence do patients' impaired cognitive abilities have on the oral health of the geriatric population?	38%	52%	0.370318
10	How much influence does increased forgetfulness have on the oral health of the geriatric population?	42%	56%	0.14
11	How much influence does increased confusion have on the oral health of the geriatric population?	38%	38%	
12	How much influence does uncooperative behavior have on the oral health of the geriatric population?	26%	56%	0.00*
13	How much influence does noncompliance with instructions have on the oral health of the geriatric population?	40%	48%	0.64
14	How much influence do legal problems such as guardianship have on the oral health of the geriatric population?	28%	50%	0.04*
15	How much influence does mental illness have on the oral health of the geriatric population?	40%	70%	0.00*

Group I, third-and fourth-year students; Group II, fifth-year students and interns.

*Significant.

throughout the dental studies curriculum, rather than focusing on specific courses, has increased positive attitudes towards the geriatric population.^{23,24} Increased emphasis for inclusion of should be made geriatric dentistry in the preclinical, paraclinical, and clinical subjects at the undergraduate level since previously has been reportedly successful.²⁴ Students should be encouraged to treat geriatric populations

in dental clinics, under supervision, with a multi-disciplinary approach. Fedele and et al.²⁵ postulated that the dentist who deals with geriatric dentistry should be a member of the interdisciplinary team. Such multi/interdisciplinary teamwork could impact the student's knowledge and attitudes about geriatric oral health problems. Moreover, Bonwell et al.²⁶ findings opined half a day with seminars or live

TABLE 5. Dental students' perceptions on the reasons for geriatric patients failing the appointments.

No.	Questionnaire (Part IIIB)	Group I	Group II	P value
1	Transportation problem	48%	50%	0.61
2	Financial problem	40%	46%	0.69
3	Family problem	36%	34%	0.66
4	They do not understand how important keeping appointments are	28%	16%	0.05
5	They do not care about their oral health	58%	56%	0.13
6	Teeth are not at the top of the priority list	34%	60%	0.03*
7	Other problems become overwhelming, and self-care esteem seems unimportant	32%	34%	0.97
8	Abuse or neglect by family members or caregivers	30%	34%	0.81

Group I, third-and fourth-year students; Group II, fifth-year students and interns.

*Significant.

webinars on geriatric oral health issues. The progressive geriatric workforce should support geriatric patients by utilizing an interprofessional educational approach. On the other hand, it has been suggested that a 2-hour education program for students would help to get the awareness of oral health difficulties in the geriatric population.²⁵ Kiyak et al.²⁷ performed a self-assessment of competence in geriatric dentistry and concluded that clinical teaching might be an opportunity to practice skills and reinforce knowledge. This approach has been implemented in didactic courses in geriatrics. However, it is essential to design and develop a curriculum as a dental education program component. There is a need to explore knowledge and perceptions on geriatric dentistry among dental students with large sample size. Furthermore, a multinational study could explain the requirement and use of geriatric dentistry in undergraduate education in Saudi Arabia.

LIMITATIONS

The present study has some limitations. First, it included only 100 students belonging to a Government University, which could be a latent limitation of the study. Second, the lack of assessment of the student's ability to develop a good interpersonal relationship with general and geriatric

patients was not assessed. Third, all the students attending the third to the fifth-year and interns were included in the study; hence, gender-based analysis was not carried out. Lastly, the study findings are related to only one college in the kingdom of Saudi Arabia. So, the results from the study are impossible to generalize, and these findings can only be used as a reference point for further studies.

CONCLUSIONS

Overall, significantly lower scores were achieved by all the students who participated in the study. The students belong to the fifth year, and interns achieved higher scores than the third- and fourth years. Dental graduates in Saudi Arabia lack positive approaches in providing primary health care to a rapidly growing geriatric population. Therefore, there is an increased need to focus on a geriatric component introduction in the dental curriculum for undergraduates in Saudi Arabia is strongly recommended.

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CONFLICTS OF INTEREST

No potential conflict of interests was reported by the author.

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