(International Print/Online Journal)

SJIF IMPACT FACTOR: 6.829
PUBMED-National Library of Medicine ID-101739732

ISSN (Print): 2209-2870
ISSN (Online): 2209-2862

International Journal of Medical Science and Current Research (IJMSCR)
Available online at: www.ijmscr.com
Volume 9, Issue 3, Page No: 519-529
May-June 2026

IJMSCR

Bridging Generational Divides in Oral Healthcare: An Analysis of the Perceptions and Clinical Preparedness of Undergraduate Dental Students towards Geriatric Care in Moradabad

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Type of Publication: Original Research Paper
Conflicts of Interest: Nil

Abstract

Background: Population aging is a global public health challenge that has increased the demand for dental professionals capable of managing the complex oral healthcare needs of older adults. Assessing the preparedness of undergraduate dental students is essential for identifying educational gaps and strengthening geriatric dental training.

Aim: To assess the perceptions, awareness, attitudes, perceived barriers, and clinical preparedness of undergraduate dental students toward geriatric oral healthcare in Moradabad, India.

Methods: A descriptive cross-sectional study was conducted among 264 undergraduate dental students, including third-year students, fourth-year students, and interns. Data were collected using a validated self-administered questionnaire comprising domains related to awareness and knowledge, attitudes toward elderly patients, perceived barriers to geriatric care, and educational preferences. Statistical analysis was performed using SPSS version 20.0. Descriptive statistics and Chi-square tests were applied, with a p-value <0.05 considered statistically significant.

Results: Among participants, 48.1% were third-year students, 25.4% were fourth-year students, and 26.5% were interns. Approximately 70% recognized the importance of geriatric oral healthcare. Awareness of specific oral health needs of elderly patients was reported by 52.3% of participants. More than half (52.3%) expressed empathy toward elderly patients, whereas only 31.1% reported enjoying interactions with older adults. Significant differences among academic years were observed regarding perceptions of curriculum adequacy, appreciation of elderly patients, communication barriers, and treatment-related challenges ($p<0.05$). Communication difficulties were identified as a barrier by 50.8% of respondents. The majority remained neutral regarding their preparedness. Nearly half supported mandatory hands-on geriatric training (45.1%) and participation in community-based outreach programs (49.2%).

Conclusion: Undergraduate dental students demonstrated generally positive attitudes toward geriatric oral healthcare and recognized its importance; however, uncertainty regarding awareness, clinical preparedness, and management of elderly patients remains evident. Strengthening undergraduate geriatric dentistry education through enhanced clinical exposure, structured hands-on training, communication skills development, and community-based learning opportunities may improve students' readiness to provide effective oral healthcare for the growing elderly population.

Keywords: Geriatric dentistry; Oral healthcare; Dental students; Attitudes; Clinical preparedness; Dental education; Elderly patient

Introduction

Population ageing represents one of the most significant demographic transitions of the twenty-first century. Advances in public health, medical care, nutrition, and socioeconomic development have contributed to increased life expectancy worldwide, resulting in a rapidly expanding elderly population. According to global projections, the number of individuals aged 60 years and above is expected to rise substantially over the coming decades, creating significant challenges for healthcare systems and healthcare professionals. In India, the proportion of older adults has steadily increased, highlighting the need for healthcare services that address the unique medical, social, and oral health requirements of this population. [1,2]

Ageing is frequently associated with an increased prevalence of chronic systemic diseases, including diabetes mellitus, hypertension, cardiovascular disorders, arthritis, neurodegenerative conditions, and depression. These conditions often influence oral health status and may complicate dental treatment planning and delivery. Older adults commonly experience oral health problems such as periodontal disease, root caries, tooth loss, xerostomia, impaired mastication, and swallowing difficulties, all of which can adversely affect nutrition, quality of life, and overall well-being. Furthermore, polypharmacy, multiple comorbidities, reduced mobility, financial constraints, and limited social support may hinder access to oral healthcare services and contribute to unmet treatment needs.[2,3]

Geriatric dentistry is a specialized area of dental practice that focuses on the prevention, diagnosis, and management of oral health conditions affecting older adults. Effective care of elderly patients requires not only clinical competence but also an understanding of the physiological, psychological, behavioral, and social changes associated with ageing. Consequently, dental professionals must possess adequate knowledge, positive attitudes, effective communication skills, and clinical confidence to provide comprehensive and patient-centered care for older adults. [1,4]

Dental education plays a pivotal role in preparing future practitioners to meet the growing oral healthcare demands of ageing populations. Previous studies have demonstrated that exposure to geriatric patients during undergraduate training enhances students' knowledge, confidence, communication skills, and attitudes toward elderly care. Clinical and didactic experiences in gerodontology have been shown to improve self-perceived competence in diagnosis, treatment planning, and management of older adults, thereby increasing students' willingness to provide care for this population.[5]

Despite the increasing importance of geriatric oral healthcare, geriatric dentistry remains inadequately represented in many undergraduate dental curricula, particularly in developing countries. Previous investigations have reported that dental students often possess limited knowledge of geriatric oral healthcare and may lack confidence in managing elderly patients with complex medical and psychosocial needs. Barriers such as insufficient clinical exposure, inadequate training opportunities, communication difficulties, concerns regarding patient compliance, and the management of medically compromised older adults have been identified as factors that may influence students' preparedness for geriatric care.[1,3]

Although several studies have reported generally positive attitudes among dental students toward elderly patients, variations in knowledge, confidence, and preparedness continue to exist. Furthermore, evidence regarding undergraduate dental students' perceptions and readiness to provide geriatric oral healthcare remains limited in many regions of India. Understanding students' awareness, attitudes, perceived barriers, and educational needs is essential for identifying gaps within current training programs and guiding curriculum development.

Therefore, the present study was undertaken to assess the perceptions, awareness, attitudes, perceived barriers, and clinical preparedness of undergraduate

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dental students toward geriatric oral healthcare in Moradabad, India. The findings may contribute to the development of targeted educational strategies aimed at strengthening geriatric dentistry training and improving future oral healthcare delivery for the growing elderly population.

Aims And Objectives

The present study aimed to evaluate the perceptions, attitudes, and clinical preparedness of undergraduate dental students toward geriatric oral healthcare in Moradabad and to identify educational factors influencing their readiness to provide comprehensive dental care to the growing elderly population.

The secondary objectives included:

1. To assess the attitudes and perceptions of undergraduate dental students toward elderly patients and geriatric oral healthcare.

2. To evaluate the level of clinical preparedness and self-confidence of dental students in managing geriatric patients.

3. To identify perceived barriers encountered by students in providing dental care to older adults, including communication, patient compliance, and treatment-related challenges.

Materials And Methods

Study Design and Sample

This study was designed as an observational, descriptive cross-sectional questionnaire-based survey to evaluate the perceptions and clinical preparedness of undergraduate dental students toward geriatric oral healthcare. The survey was designed, analyzed, and interpreted according to the STROBE guidelines. The study was conducted among undergraduate dental students of Kothiwal Dental College & Research Centre, Moradabad, Uttar Pradesh, India.

Ethical approval was obtained from the Institutional Ethics Committee before the commencement of the study. Participation was voluntary, and informed consent was obtained from all participants prior to data collection. Undergraduate students from the third year, final year, and internship who were willing to participate were included in the study. Students who were absent during the period of data collection or who submitted incomplete questionnaires were excluded.

The sample size was determined based on previous studies assessing attitudes toward geriatric care among dental students. A convenience sampling method was employed, and all eligible students were invited to participate. The study population included clinical undergraduate students to enable comparison of perceptions and preparedness across different stages of dental education.

Questionnaire Development

A structured self-administered questionnaire was developed after an extensive review of the literature on geriatric dentistry and previously validated instruments used by Venkatesh et al., Devaki et al., and Singh et al.[1,2,4] The questionnaire consisted of three sections. The first section collected demographic information, including age, gender, year of study, family type, relationship with grandparents, and previous exposure to geriatric patients. The second section assessed students' attitudes and perceptions toward elderly individuals using items adapted from the University of California Los Angeles Geriatric Attitude Scale (GAS). The third section evaluated clinical preparedness, confidence in managing geriatric patients, communication skills, perceived barriers to treatment, and the need for additional training in geriatric dentistry.

Questionnaire responses were initially recorded using a five-point Likert scale comprising Strongly Disagree, Disagree, Neutral, Agree, and Strongly Agree. Prior to statistical analysis, responses were recorded into three categories by combining Strongly Agree with Agree and Strongly Disagree with Disagree, while retaining Neutral as a separate category. This recategorization was undertaken to simplify data presentation, improve interpretability, and ensure adequate frequencies within response categories for statistical analysis, consistent with recommendations in standard biostatistical literature.[12,13,14] A pilot study was conducted among a small group of students to assess clarity, validity, and reliability of the questionnaire, and necessary modifications were made before final administration.

Data Collection

Data were collected over a predetermined study period using printed questionnaires. Participants were informed about the objectives of the study, confidentiality of responses, and their right to

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withdraw at any stage without consequences. No personal identifiers were recorded to maintain anonymity. Completed questionnaires were checked for completeness and coded before entry into the database.

Statistical Analysis

Data were entered into Microsoft Excel and analyzed using the Statistical Package for Social Sciences (SPSS) software version 20.0 (IBM Corp., Armonk, NY, USA). Descriptive statistics, including frequencies, percentages, means, and standard deviations, were calculated for all variables. Attitude and preparedness scores were computed by summing responses to individual questionnaire items after appropriate reverse scoring of negatively worded statements. Comparisons between groups based on gender, academic year, previous geriatric exposure, and other demographic variables were performed using independent t-tests and one-way analysis of variance (ANOVA) where appropriate. Associations between categorical variables were analyzed using Chi-square or Fisher's exact tests. The internal consistency of the questionnaire was assessed using Cronbach's alpha coefficient. Statistical significance was set at a p-value of less than 0.05.

Results

The present study included a total of 264 undergraduate dental students from different academic levels. As shown in Table 1, 48.1% of participants were third-year students, 25.4% were fourth-year students, and 26.5% were interns, providing representation across different stages of clinical training.

Table 1. Distribution of subjects according to year of study.

Year of Study	Frequency	Percent (%)
Third Year	127	48.1
Fourth Year	67	25.4
Interns	70	26.5
Total	**264**	**100.0**

As shown in Table 2, mean age increased significantly with academic progression, from 21.62 ± 1.25 years among third-year students to 24.44 ± 1.38 years among interns ($F = 124.56$, $p < 0.001$).

Table 2. Mean age of subjects according to year of study.

Year of Study	Mean Age (years)	SD
Third Year	21.62	1.25
Fourth Year	23.37	1.08
Interns	24.44	1.38

$F = 124.56$; $p < 0.001$*

Female students constituted the majority in all academic years, ranging from 55.2% to 67.7% (Table 3). Regarding the perceived importance of geriatric dental care, approximately 70% of participants considered geriatric care important, indicating a generally positive perception of elderly oral healthcare.

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Table 3. Distribution of subjects according to gender across academic years.

Gender	3rd Year n(%)	4th Year n(%)	Interns n(%)	Total n	Total %
Female	86 (67.7)	37 (55.2)	43 (61.4)	166	62.9
Male	41 (32.3)	30 (44.8)	27 (38.6)	98	37.1

Under the domain of awareness and knowledge, 52.3% of respondents agreed that they were aware of the specific oral health needs of elderly patients, whereas 38.6% remained neutral and 9.1% disagreed. Nearly half of the participants (47.3%) believed that geriatric dentistry was adequately represented in the curriculum, while 28.4% disagreed. This perception differed significantly across academic years (χ^2 = 17.83, $p < 0.01$). Only 20.1% of respondents agreed that elderly patients require a different approach to dental treatment planning, whereas 74.2% remained neutral, suggesting uncertainty regarding this aspect of geriatric care. Furthermore, 41.7% agreed that geriatric oral care should receive greater emphasis within dental education.

With respect to attitudes toward geriatric care, 31.1% of respondents reported enjoying interactions with older patients, while 56.1% remained neutral. A total of 42.4% believed that elderly patients are more appreciative of dental care than younger patients, with significant variation across academic years (χ^2 = 10.16, p = 0.03). More than half of the participants (52.3%) reported feeling empathetic toward elderly patients. Only 23.9% agreed that elderly patients are more challenging to treat because of multiple health conditions, whereas 69.7%remained neutral. Approximately one-third (32.2%) believed that treating elderly patients requires more time and effort than treating younger patients, and this perception differed significantly among academic years (χ^2 = 9.69, p = 0.04). While 43.9% preferred treating younger patients, 37.9% disagreed with this preference. Additionally, 38.6% found listening to the life experiences of older adults interesting, whereas 43.2% disagreed (χ^2 = 13.38, p = 0.003). Interest in pursuing geriatric dentistry as a future specialty was expressed by 42.0% of participants.

Under the domain of perceived barriers, only 23.1% agreed that lack of clinical exposure to elderly patients limited their confidence in treatment provision, whereas 73.1% remained neutral and 3.8% disagreed. Approximately one-fifth of respondents (19.7%) agreed that they had not received adequate training in managing medically compromised elderly patients, while most remained neutral (78.4%). Communication barriers were reported by 50.8% of participants and showed significant variation among academic years (χ^2 = 11.76, p = 0.019). A total of 44.7% agreed that insufficient teaching hours were devoted to geriatric dentistry, whereas 42.8% believed that time constraints in clinics hindered delivery of quality care to elderly patients.

Regarding preferences and suggestions, 27.7% preferred treating elderly patients in a college clinical setting, while 36.4% preferred hospital-based settings. Nearly half of the participants (49.2%) expressed willingness to participate in community programs focused on elderly oral healthcare. Furthermore, 45.1% supported mandatory hands-on training in geriatric patient management during undergraduate education. Mobile dental clinics were considered a practical approach for delivering oral healthcare to elderly populations by 36.0% of respondents, while 51.1% remained neutral.

Detailed year-wise comparisons for all questionnaire items with corresponding Chi-square values and p-values are presented in Table 4.

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Table 4. Year-wise comparison of responses to questionnaire items (N = 264).

Questionnaire Item	Agree n(%)	Neutral n(%)	Disagree n(%)	Chi-square	p-value
I am aware of the specific oral health needs of elderly patients.	138 (52.3)	102 (38.6)	24 (9.1)	2.54	0.63
Geriatric dentistry is included adequately in my academic curriculum.	125 (47.3)	64 (24.2)	75 (28.4)	17.83	<0.01*
Geriatric patients require a different approach in dental treatment planning.	53 (20.1)	196 (74.2)	15 (5.7)	3.13	0.53
I feel that geriatric oral care should be emphasized more in dental education.	110 (41.7)	79 (29.9)	75 (28.4)	8.54	0.07

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I enjoy interacting with older patients.	82 (31.1)	148 (56.1)	34 (12.9)	5.58	0.23
I find elderly patients more appreciative of dental care than younger patients.	112 (42.4)	113 (42.8)	39 (14.8)	10.16	0.03*
I feel more empathetic toward elderly patients.	138 (52.3)	101 (38.3)	25 (9.5)	7.34	0.11
Older patients are often more challenging to treat due to multiple health conditions.	63 (23.9)	184 (69.7)	17 (6.4)	1.29	0.86
Treating older patients takes more time and effort than treating younger patients.	85 (32.2)	38 (14.4)	141 (53.4)	9.69	0.04*
I prefer treating younger patients compared to elderly ones.	116 (43.9)	48 (18.2)	100 (37.9)	4.05	0.39
Listening to life experiences of older adults is interesting.	102 (38.6)	48 (18.2)	114 (43.2)	13.38	0.003*
I would consider specializing in geriatric dentistry in the future.	111 (42.0)	103 (39.0)	50 (18.9)	6.13	0.19
Lack of clinical exposure to elderly patients limits my confidence in treating them.	61 (23.1)	193 (73.1)	10 (3.8)	4.14	0.39
I have not received enough training in managing medically compromised elderly patients.	52 (19.7)	207 (78.4)	5 (1.9)	3.17	0.53
Language and communication barriers make treating elderly patients more difficult.	134 (50.8)	87 (33.0)	43 (16.3)	11.76	0.019*
There are insufficient teaching hours dedicated to geriatric dentistry in the curriculum.	118 (44.7)	122 (46.2)	24 (9.1)	1.87	0.76
Time constraints in clinics make it harder to provide quality care to elderly patients.	113 (42.8)	75 (28.4)	76 (28.8)	2.36	0.67
I would prefer treating elderly patients in a clinical (college) setup.	73 (27.7)	181 (68.6)	10 (3.8)	2.38	0.67
I would prefer treating elderly patients in hospital settings.	96 (36.4)	156 (59.1)	12 (4.5)	3.23	0.52
I would like to participate in community programs targeting elderly dental care.	130 (49.2)	120 (45.5)	14 (5.3)	5.52	0.24
Hands-on training in treating elderly patients should be mandatory during undergraduate education.	119 (45.1)	91 (34.5)	54 (20.5)	5.90	0.20

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Discussion

The increasing proportion of older adults worldwide has created a growing demand for dental professionals who are competent in addressing the complex oral healthcare needs of the elderly population. As life expectancy continues to increase, dental practitioners are expected to manage age-related oral diseases, systemic comorbidities, polypharmacy, functional limitations, and psychosocial challenges that frequently accompany aging. Consequently, undergraduate dental education plays a critical role in preparing future dentists for the provision of comprehensive geriatric oral healthcare. The present study assessed the awareness, attitudes, perceived barriers, and clinical preparedness of undergraduate dental students toward geriatric oral healthcare in Moradabad.

One of the principal findings of this study was the generally positive perception of geriatric oral healthcare among undergraduate dental students. Approximately 70% of participants recognized the importance of providing dental care to elderly patients, indicating a favorable baseline awareness regarding the significance of geriatric oral health. This finding is consistent with previous investigations conducted among dental students in India and internationally, which have reported positive attitudes toward older adults and recognition of the growing need for geriatric dental services.[1,2], The increasing visibility of population aging and its associated healthcare challenges may have contributed to this awareness among contemporary dental students.

Despite recognizing the importance of geriatric oral healthcare, only 52.3% of participants reported awareness of the specific oral health needs of elderly patients, while a substantial proportion remained neutral. This finding suggests that although students appreciate the importance of elderly care, their understanding of the clinical and biological complexities associated with aging may be incomplete. Similar observations have been reported in previous studies where positive attitudes toward older adults coexisted with limited confidence in managing age-related oral conditions and medically compromised elderly patients.[3,9] Elderly individuals frequently present with chronic systemic diseases, medication-related oral manifestations, root caries, xerostomia, periodontal disease, tooth loss, and prosthodontic challenges that require specialized knowledge and multidisciplinary management. The observed uncertainty among students highlights the need for greater emphasis on geriatric dentistry within undergraduate curricula.

An important finding of the present study was the significant difference among academic years regarding perceptions of curriculum adequacy. Less than half of the participants believed that geriatric dentistry was adequately represented within the curriculum, and this perception varied significantly across academic levels ($\chi^2 = 17.83$, $p < 0.01$). Students in advanced stages of training appeared to demonstrate greater awareness of geriatric oral healthcare issues than those in earlier years, suggesting that clinical exposure may positively influence understanding and preparedness. [5] This observation supports educational models that emphasize experiential learning and early clinical engagement. Strengthening geriatric content throughout the undergraduate curriculum may help bridge existing educational gaps and improve preparedness before graduation.

The attitudinal findings of the study were generally encouraging. More than half of the participants reported feeling empathetic toward elderly patients, indicating a positive disposition toward providing care for older adults. Furthermore, a considerable proportion perceived elderly patients as more appreciative of dental treatment than younger individuals, with this belief varying significantly across academic years ($\chi^2 = 10.16$, $p = 0.03$). Positive attitudes toward older adults are important because they contribute to effective patient-provider relationships, improved communication, greater treatment acceptance, and enhanced quality of care.[6,7] However, only 31.1% of respondents reported enjoying interactions with older patients, while the majority remained neutral. This finding may reflect limited opportunities for meaningful engagement with elderly individuals during undergraduate training rather than negative attitudes toward older adults themselves.

The present study also explored students' perceptions regarding the complexity of geriatric dental care. Only 23.9% of respondents agreed that elderly patients are more challenging to treat because of multiple health conditions, whereas the majority remained neutral. Similarly, approximately one-third believed that

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treatment of elderly patients requires more time and effort, a perception that varied significantly across academic years ($\chi^2 = 9.69$, $p = 0.04$). These findings suggest that many students may not yet have sufficient clinical experience with elderly individuals to fully appreciate the complexities associated with geriatric care. Previous studies have reported that direct clinical exposure to older adults significantly improves students' understanding of the medical, functional, and psychosocial factors influencing treatment planning.[5,10] Therefore, the large proportion of neutral responses observed in the present study may reflect uncertainty rather than a clearly defined perception.

Interestingly, although 43.9% of participants expressed a preference for treating younger patients, more than one-third disagreed with this preference. This finding suggests that a substantial proportion of students do not perceive age itself as a barrier to treatment provision. Similar findings have been reported in studies from different countries, where students demonstrated willingness to treat elderly patients despite acknowledging the additional challenges associated with geriatric care. ¶[7,1] Such observations may indicate the development of patient-centered attitudes and professional responsibility among future dental practitioners.

The study further identified several barriers that may influence students' preparedness for geriatric dental care. Communication barriers emerged as one of the most commonly reported challenges, with approximately half of the participants agreeing that communication difficulties complicate treatment of elderly patients ($\chi^2 = 11.76$, $p = 0.019$). This finding is consistent with previous reports highlighting the impact of hearing impairment, cognitive decline, language differences, and reduced health literacy on dentist-patient interactions.[3] Effective communication is particularly important in geriatric dentistry because it influences history taking, informed consent, treatment adherence, and patient satisfaction. Incorporating communication skills training through simulation exercises, role-playing activities, and supervised clinical encounters may therefore enhance students' confidence in managing elderly patients.

Another notable finding was the uncertainty regarding clinical preparedness. Although only 23.1% of participants agreed that lack of clinical exposure reduced their confidence in treating elderly patients, the majority remained neutral (73.1%). Similarly, only one-fifth of respondents reported inadequate training in managing medically compromised elderly individuals, while most remained undecided. The predominance of neutral responses in these domains suggests uncertainty rather than confidence. This pattern may indicate that many students have not yet acquired sufficient clinical experience to accurately assess their preparedness. Previous studies have consistently demonstrated that direct interaction with elderly patients through nursing-home visits, outreach programs, community postings, and dedicated geriatric clinics improves both competence and confidence among dental students.[1,5,11] Increasing opportunities for supervised clinical exposure may therefore strengthen preparedness for geriatric practice.

Students also identified educational areas requiring improvement. Nearly half of the participants supported mandatory hands-on training in geriatric dentistry during undergraduate education (45.1%), and a similar proportion expressed willingness to participate in community-based programs focused on elderly oral healthcare (49.2%). These findings highlight student recognition of the importance of experiential learning. Community outreach programs, mobile dental clinics, and structured geriatric rotations have been shown to improve clinical competence, communication skills, empathy, and understanding of the social determinants affecting elderly health.[1,2,5] The positive response toward such initiatives observed in the present study supports their greater incorporation into undergraduate dental education.

The present study has certain limitations that should be considered while interpreting the findings. The cross-sectional design provides information at a single point in time and therefore cannot establish causal relationships. The study was conducted within a single institution, which may limit the generalizability of the findings to other educational settings. In addition, self-reported responses may be influenced by social desirability bias and individual interpretation of questionnaire items. Despite these limitations, the study provides valuable insights into undergraduate students' perceptions and preparedness regarding geriatric oral healthcare and identifies important areas for curricular enhancement.

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Overall, the findings suggest that undergraduate dental students possess generally positive attitudes toward elderly patients and recognize the importance of geriatric oral healthcare. However, uncertainty regarding awareness, clinical preparedness, and management of elderly patients remains evident. Strengthening undergraduate geriatric dentistry education through enhanced clinical exposure, structured hands-on training, communication skills development, and community-based learning opportunities may improve students' readiness to meet the evolving oral healthcare needs of the aging population.

Conclusion

The present study demonstrated that undergraduate dental students generally recognize the importance of geriatric oral healthcare and exhibit positive attitudes toward elderly patients. However, the findings also revealed uncertainty regarding awareness of specific geriatric oral health needs, clinical preparedness, and management of elderly individuals with complex healthcare requirements. Significant variations observed across academic years suggest that clinical experience may influence students' perceptions and confidence in providing geriatric care.

Communication challenges, limited practical exposure, and concerns regarding training adequacy emerged as important educational issues. The substantial proportion of neutral responses across several domains indicates that many students may not yet feel sufficiently prepared to manage the unique needs of older adults in clinical practice.

These findings highlight the need for strengthening geriatric dentistry education within undergraduate dental curricula through enhanced clinical exposure, structured hands-on training, communication skills development, and community-based learning experiences. Such educational strategies may improve students' competence, confidence, and preparedness to deliver comprehensive oral healthcare to the growing elderly population.

Source of Funding: This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Ethical Approval: Ethical approval was obtained from the Institutional Ethics Committee of Kothiwal Dental College & Research Centre, Moradabad prior to commencement of the study.

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