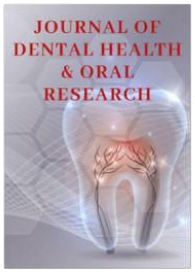

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Review Article

Knowledge Gaps and Age-related Misconception Among Prosthodontic Trainees: Findings from a Four-Year Cohort Study in Geriatric Dentistry

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Abstract

Objective: This study investigates age-related misunderstanding among postgraduate prosthodontic trainees using the Facts on Aging Quiz (FAQ) to assess their knowledge and misconceptions about the elderly.

Methods: A cross-sectional analysis was conducted using the Facts on Aging Quiz (FAQ), a total of 26 trainees (12 male, 14 female) from four academic cohorts (2022-2025) completed the FAQ. Scores were analyzed using descriptive statistics, Mann-Whitney U tests, Kruskal-Wallis H tests and item-level comparisons to evaluate knowledge differences across gender and time.

Results: There was no statistically significant difference in overall performance between genders or among year-based cohorts. However, several items revealed shared misconceptions that may reflect ageist bias. Gender-based analysis showed content-specific trends, with females scoring higher on 24 items.

Conclusion: The research highlights subtle forms of ageism that may influence treatment planning and patient communication. The findings support the need for targeted geriatric content in specialist training, ensuring future prosthodontists are equipped to deliver equitable and compassionate care to an increasingly aging population. Addressing these misconceptions is essential for ensuring that future prosthodontists are not only clinically competent but also free from biases that could compromise the quality of care.

Keywords: Geriatric; Aged Population; Postgraduate; Prosthodontic; Education

Introduction

As populations around the world continue to age, the demand for competent, age-sensitive and customized dental care has become increasingly crucial. Geriatric patients present with unique challenges such as multiple comorbidities, polypharmacy, altered salivary function, cognitive decline and physical limitations that impact oral health management [1]. These complexities require not only clinical proficiency but also a strong foundation in behavioral science and communication strategies tailored to older adults. Despite this, several studies report that geriatric content remains underrepresented in dental curricula worldwide, leading to low sureness and preparedness among dental graduates in treating older patients [2]. Research's of the extent of knowledge about geriatric dental patients are increasingly important, given the indication of widespread negative attitudes toward old adults that in turn may be based upon untrue stereotypes of old adults [3]. The degree to which prosthodontic trainee shares those undesirable attitudes has not been well-determined in the current literature.

The inclusion of structured geriatric dental courses has been shown to improve both knowledge and attitudes toward elderly care, reduce ageist assumptions and enhance decision-making in complex cases [4]. Ageism-judgement based on age-is progressively recognized as a barrier to unbiased dental care delivery. In dentistry, ageist attitudes can influence not only treatment planning but also the quality of communication and options for treatment plan. Prosthodontists often treat older

populations needing complex dental restorations and rehabilitation care, making their understanding of aging both clinically and ethically important.

Despite the growing importance of geriatric care in dentistry, there remains a striking absence of focused research exploring ageism and knowledge-based misconceptions among dental professionals, particularly within postgraduate prosthodontic training. Most existing studies have concentrated on undergraduate students or generalized dental populations, leaving a gap in our understanding of how specialist trainees-those who will manage the most complex restorative and prosthetic rehabilitation cases-perceive and respond to aging-related problems. The transition from foundational dental education to specialized practice represents a critical period in which attitudes solidify and influence clinical decision-making. Yet, few studies have evaluated whether trainees carry forward implicit ageist assumptions or develop more informed, person-centered perspectives. This research seeks to address that gap by not only measuring knowledge deficits but also identifying content-specific areas where biases may influence prosthodontic care. The following null hypotheses were tested in this study. First, there is no significant difference in the overall knowledge of aging (FAQ scores) in male and female postgraduate prosthodontic trainees. Second, there is no significant difference in knowledge of aging across the four academic cohorts (2022-2025).

Literature Review

This research investigates the presence of ageist biases among postgraduate prosthodontic trainees using the Facts on Aging Quiz (FAQ), a validated tool assessing factual knowledge about older adults [5,6]. The study further explores whether these attitudes vary by gender or over time (cohort differences), with the goal of identifying key misconceptions that may warrant targeted intervention. The Facts on Aging Quiz (FAQ) is a widely used instrument developed to assess knowledge and misconceptions about aging among students and professionals in health-related fields. Originally created by Palmore in the late 1970s and updated over time, the quiz includes statements related to physical, psychological and social aspects of aging, with responses marked as true or false. The FAQ serves not only as a diagnostic tool for identifying gaps in knowledge but also as a catalyst for insightful learning about implicit ageist attitudes. The 2015 revised version of the quiz by Breytspraak and Badura offers a more contemporary framework aligned with current gerontological findings [7].

Previous studies have established that healthcare professionals, including dentists, often hold implicit biases about older adults. These can manifest as undertreatment, reduced communication or assumptions about patient compliance and cognitive ability [8]. Researchers found that dentists with limited training in geriatric care were more likely to perceive older adults as less capable of benefiting from complex dental procedures, including implants and prosthodontic interventions [9,10].

Despite the integration of gerodontology in some dental curricula, misconceptions continue [11]. The Facts on Aging Quiz (FAQ) has been used in medical and allied health education to measure foundational knowledge and identify areas linked to ageist attitudes. Up till now, there remains limited research applying this tool in postgraduate dental training especially prosthodontic. This study fills that gap by applying the FAQ in prosthodontics and examining knowledge patterns by gender and cohort.

Method

A cross-sectional analysis was conducted using the Facts on Aging Quiz (FAQ), a 40-item true/false questionnaire addressing common myths and facts about aging. The sample consisted of 26 postgraduate prosthodontic MSc trainees (12 males, 14 females) from four academic cohorts (2022 to 2025). For each quiz item, the number of correct responses was recorded by year and gender.

Statistical Analysis

Descriptive and inferential statistics were conducted using Python (SciPy and Pandas libraries). To assess the distribution of overall scores, the Shapiro-Wilk test was used to evaluate normality for both male and female groups. Given the non-normal distribution of quiz scores, non-parametric statistical methods were employed throughout the analysis. To compare overall performance between male and female trainees, the Mann-Whitney U test was used. This test is appropriate for comparing independent groups when data are ordinal or not normally distributed, as it does not assume homogeneity of variances or Gaussian distribution. The Mann-Whitney U test enabled the identification of any statistically significant differences in overall factual knowledge of aging between genders.

To assess cohort-based differences across the academic years (2022-2025), the Kruskal-Wallis H test was applied. This non-parametric alternative to one-way ANOVA is suitable for comparing more than two independent groups when the assumptions of normality and equal variance are not met. The test examined whether trainees from different cohorts demonstrated varying levels of knowledge about aging, accounting for potential shifts in curricular delivery or academic environment.

For item-level analysis, the average proportion of correct responses for each FAQ question was calculated by gender and year. These proportions were used to identify low-scoring items (<50% correct response rate) that may reflect ageist misconceptions. Descriptive comparisons and graphical visualizations were used to explore trends across gender and cohort.

This multi-layered statistical approach enabled the identification of both broad performance trends and subtle content-specific knowledge gaps, providing insight into areas where implicit ageist attitudes may influence prosthodontic care. These findings support targeted curriculum enhancement and informed future research in geriatric dental education.

Results

A total of 26 trainees participated across four academic years (2022-2025), with 12 males and 14 females. Table 1 presents participant demographics. As shown in Table 2, the mean correct response rate was 58.3% for males (SD = 33.6) and 61.1% for females (SD = 34.7). The Mann-Whitney U test revealed no significant gender difference in total score ($U = 717.5$, $p = 0.429$).

Cohort Year	Number of Males	Number of Females
2022	3	4
2023	3	4
2024	3	2
2025	3	4

Table 1: Participant Demographics.

Male Mean Score (%)	Female Mean Score (%)	Difference	Question
91.66	93.75	2.083	Q1
91.66	87.5	-4.16	Q2
33.33	31.25	-2.08	Q3
16.66	6.25	-10.41	Q4
66.66	87.5	20.83	Q5
41.66	62.5	20.83	Q6
33.33	62.5	29.16	Q7
8.33	6.25	-2.08	Q8
41.66	56.25	14.58	Q9
58.33	75.0	16.66	Q10
100.0	81.25	-18.75	Q11
83.33	87.5	4.16	Q12
49.99	56.25	6.25	Q13
83.33	87.5	4.16	Q14
74.99	87.5	12.50	Q15
100.0	100.0	0.0	Q16
66.66	37.5	-29.16	Q17
74.99	87.5	12.50	Q18
66.66	93.75	27.08	Q19
50.0	31.25	-18.75	Q20
74.99	93.75	18.75	Q21
66.66	100.0	33.33	Q22
50.0	50.0	0.0	Q23

50.0	81.25	31.25	Q24
8.33	12.5	4.16	Q25
33.33	12.5	-20.83	Q26
83.33	68.75	-14.58	Q27
75.0	87.5	12.5	Q28
66.66	87.5	20.83	Q29
83.33	43.75	-39.58	Q30
25.0	31.25	6.25	Q31
50.0	50.0	0.0	Q32
33.33	25.0	-8.33	Q33
50.0	56.25	6.25	Q34
75.0	43.75	-31.25	Q35
66.66	81.25	14.58	Q36
33.33	56.25	22.91	Q37
74.99	75.0	1.1-14	Q38
49.99	6.25	-43.74	Q39
50.0	62.5	12.5	Q40

Table 2: Item-level accuracy by gender.

Year-wise comparison using the Kruskal-Wallis H test found no significant difference in mean scores across cohorts ($H = 2.98$, $p = 0.395$). Table 3 shows the percentage of mean score through the years and 2022, 2023 and 2025 were below 60%. However, item-level accuracy comparison (Table 4) identified thirteen questions with <50% average accuracy. These reflected persistent misconceptions on matters including for example self-perceived health (Q39), personality change (Q4), adaptability (Q25), Health risk (Q8) and offering (Q26).

Year	Mean Score (%)	Group Size
2022.0	59.6	7.0
2023.0	55	7.0
2024.0	67	5.0
2025.0	57.8	7.0

Table 3: Mean Scores by Cohort.

Question	Mean Correct Rate (%)	Question
Q8	8.57	Older adults are at risk for infectious diseases.
Q4	12.14	Personality changes with age.
Q25	12.14	Older people do not adapt as well as younger when they relocate to a new thing/environment.
Q26	24.28	Participation in volunteering and offering tends to decline among older adults.
Q39	26.42	Most older adults consider their health to be good or excellent.
Q33	30	Most old people are set in their ways and unable to change.
Q3	31.42	It is very difficult for older adults to learn new things.
Q31	31.42	Most older drivers are quite capable of safely operating a motor vehicle.
Q20	42.14	Increased problems with constipation represent a normal change as people get older.
Q37	47.14	Grandparents today take less responsibility for rearing grandchildren than ever before.
Q7	47.85	Clinical depression occurs more frequently in older than younger people.
Q9	48.57	Older females exhibit better health care practices than older males.
Q32	48.57	Older workers cannot work as effectively as younger workers

Table 4: Key misconceptions with clinical impact.

The misconception that personality changes significantly in older age may lead clinicians to underestimate older patients' consistency in values, decision-making preferences or ability to engage meaningfully in treatment planning. This belief can reinforce paternalistic approaches and limit shared decision-making. This reflects a common stereotype that older individuals are rigid or incapable of coping with change. In dental care, such bias may cause practitioners to avoid recommending new prosthetic inter-ventions or treatment transitions based on perceived resistance, rather than patient preference or clinical need. Trainees' belief in reduced societal engagement among older adults can translate into assumptions about compliance, motivation or rehabilitation potential, negatively influencing treatment expectations and long-term planning for prosthodontic care. Failure to recognize that many older adults self-report good health despite chronic conditions may lead clinicians to overemphasize deficits rather than strengths. This can skew risk assessment, underrepresent resilience and impact the tone of patient interaction.

An item-level gender analysis showed that females outperformed males on 24 ques-tions, while males scored higher on 13. Three items had equal scores. Fig. 1 illustrates this question-wise gender performance. Fig. 1 displays the total number of correct answers per gender by year. These visualizations further support the lack of significant overall differences while suggesting content-specific strengths by gender.

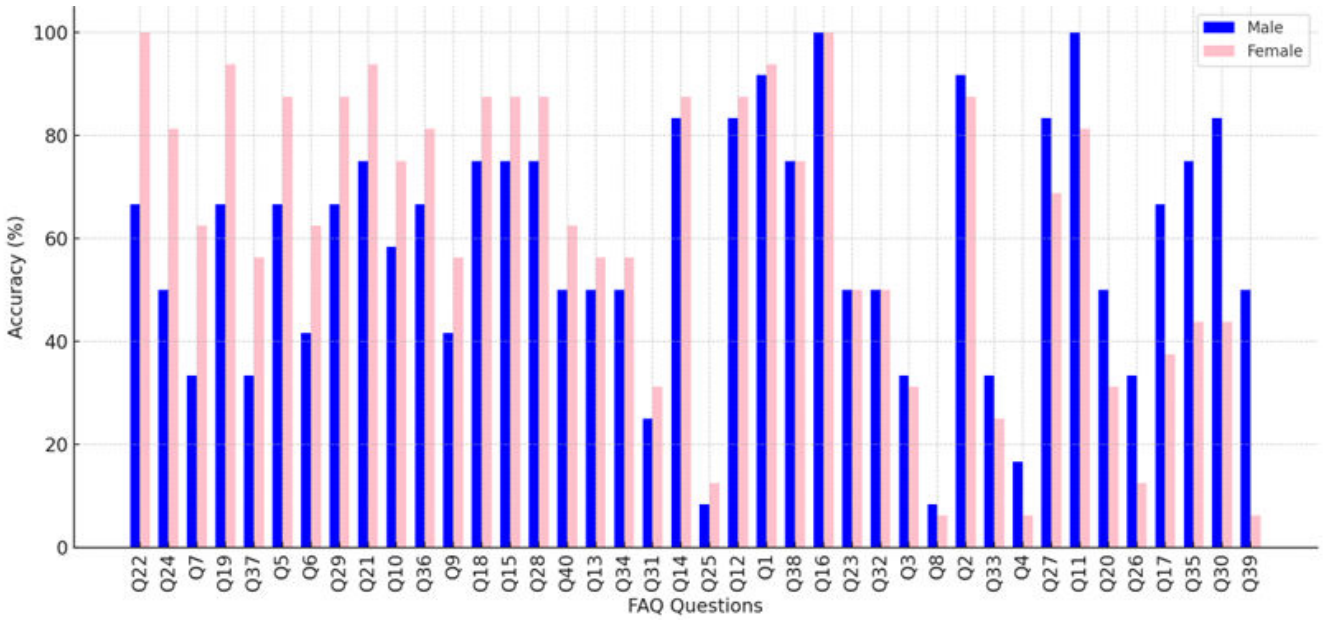

Figure 1: Item-level accuracy comparison by gender.

These statistical outcomes suggest that neither gender nor academic year significantly influenced the trainees' overall knowledge about aging. Females slightly outperformed males, with an average score of 61.1% compared to 58.3% for males. Questions where females performed notably better in Q5, Q6, Q7, Q19, Q22, Q24, Q29, Q36, Q37. Differences in favor of females ranged from +14.6% to +33.3%. These items may reflect topics or formats where female trainees excel-possibly in areas requiring conceptual understanding, attention to detail or clinical reasoning. Questions where males performed notably better were Q17, Q20, Q26, Q30, Q35, Q39. Differences ranged from -14.6% to -43.7%. These may correspond to analytical or procedural questions where male participants showed stronger performance or where females faced greater difficulty Fig. 2.

Thus, while total performance appears equivalent, a closer examination of individual items suggests meaningful content-specific differences that may reflect underlying variations in perception or training emphasis. These nuanced disparities underscore the need for targeted educational interventions addressing commonly misunderstood domains of aging, regardless of cohort or gender.

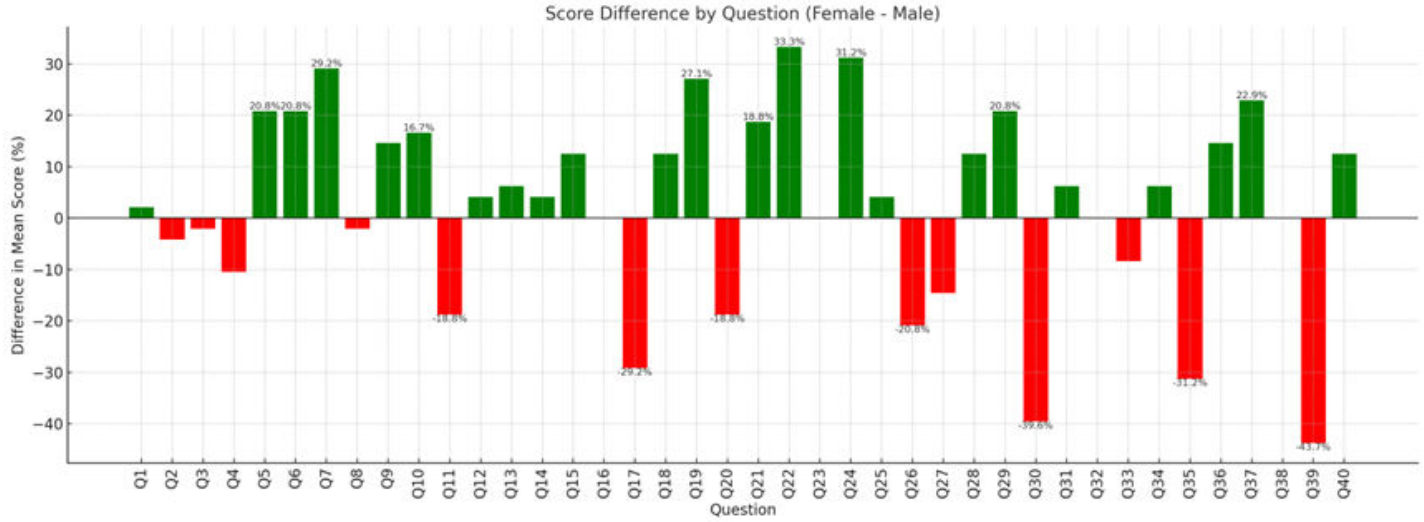

Figure 2: The visual comparison of performance differences by question/gender (Green bars indicate questions where females scored higher; red bars indicate questions where males scored higher; labels highlight questions with a difference ≥15%, showing significant disparities).

Fig. 3 presents the total number of correct answers achieved by male and female postgraduate prosthodontic trainees across four academic cohorts (2022-2025). The visual data indicate relatively stable and comparable performance trends between genders. Males marginally outperformed females in 2022 and 2024, whereas females had higher scores in 2023 and 2025. These fluctuations are modest and align with the findings presented in Table 2, which details item-level accuracy percentages.

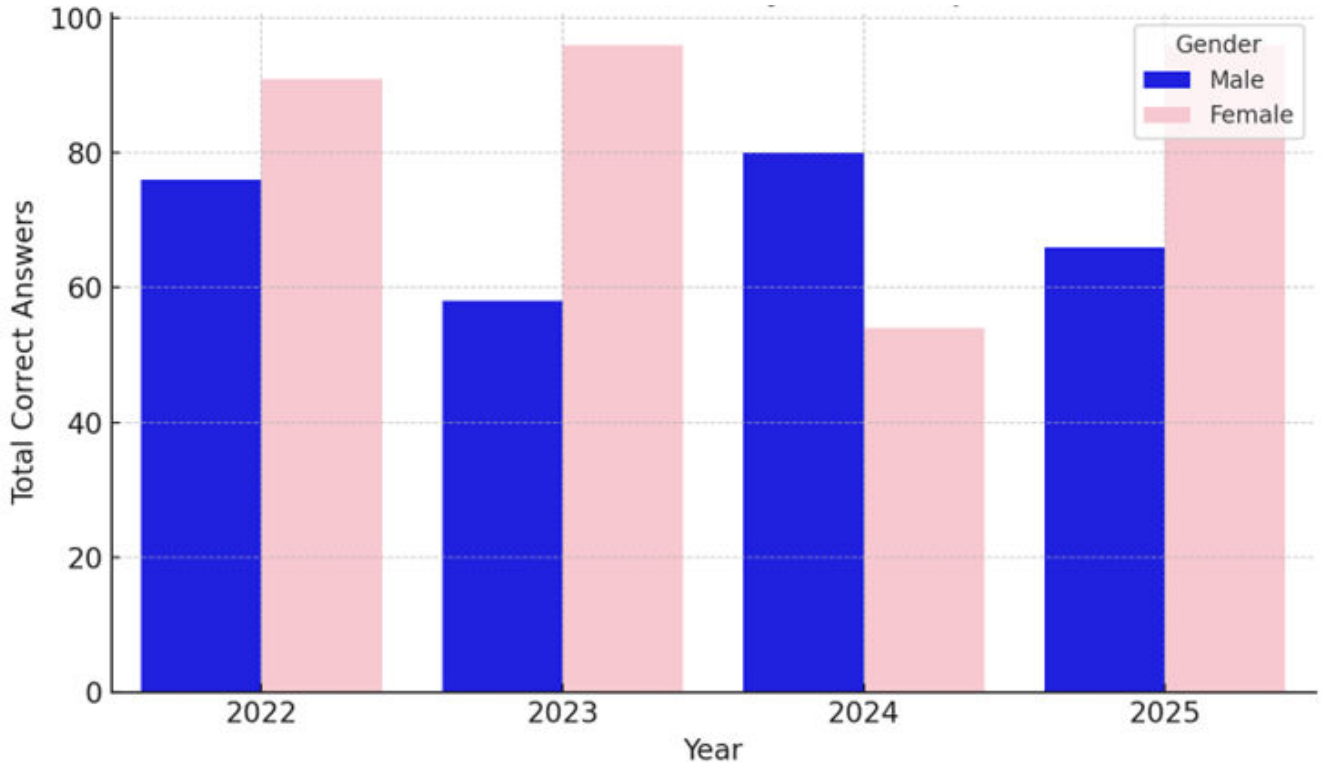

Figure 3: Total correct answers by gender per year.

Discussion

This four-year cohort study explored the extent and nature of age-related misconcep-tions among postgraduate prosthodontic trainees, with a focus on gender and co-hort-based differences in knowledge. Using the Facts on Aging Quiz (FAQ), the study sought to uncover not only general knowledge levels but also the presence of con-tent-specific misconceptions with potential clinical relevance in geriatric prosthodontics.

The findings suggest that postgraduate prosthodontic trainees, regardless of gender, share similar levels of knowledge about aging. However, a substantial number of incorrect responses on key items indicate persistent misconceptions-particularly re-garding cognitive ability, mental health and adaptability in older adults.

These knowledge gaps may translate into implicit ageist attitudes, affecting how care is planned and delivered to geriatric patients. Literature has shown that dental practitioners with limited knowledge of aging are more likely to:
Several FAQ items showed alarmingly low accuracy (<50%) across participants, revealing shared misconceptions that could adversely influence geriatric care. This raises concern in prosthodontics, where treatment planning heavily depends on clinician judgment. Failure to correct these biases may result in under-treatment or overtreat-ment, compromising geriatric care quality. These align with domains known to be susceptible to implicit ageist bias, particularly among healthcare professionals with insufficient geriatric training [12]. Importantly, female trainees demonstrated better awareness in these areas, which may reflect a more holistic or empathetic orientation in their approach to aging-related issues.

Despite stable overall knowledge, this study reveals significant attitudinal blind spots that could undermine equitable care. The misconceptions uncovered are not merely factual errors but signal the persistence of outdated narratives about aging. These can directly affect prosthodontic treatment planning by: Reducing the likelihood of shared decision-making. Limiting therapeutic options due to assumed frailty or disinterest. Hindering rapport-building and trust with older patients.

Therefore, the findings strongly support integrating gerodontology and ethical dis-course into postgraduate training, especially with modules focused on: Psychosocial dynamics of aging. Cognitive and behavioral adaptability. Intergenerational commu-nication. Reflective practice addressing bias.

These nuanced disparities underscore the need for targeted educational interventions addressing commonly misunderstood domains of aging, regardless of cohort or gender. The study's findings echo prior research. Piaton and his team and Shenoy, also documented stereotypical views among dental students, especially around cognitive decline and perceived patient non-compliance [13,14]. In line with Karabulut Gençer, et al., our study found no significant statistical difference across gender or year but high-lighted persistent misconceptions, reinforcing the need for content-sensitive reform rather than broad-stroke training [15]. Interestingly, our gender analysis supports Shenoy et al.'s findings that female students may harbor fewer ageist views, particularly in psychosocial contexts a promising but underutilized trend in educational planning.

Conclusion

This four-year cohort study investigated the presence of knowledge gaps and potential ageist attitudes among postgraduate prosthodontic trainees using the Facts on Aging Quiz. While overall performance did not differ significantly by gender or academic year, the consistent presence of critical misconceptions-particularly in domains related to adaptability, personality change and self-perceived health underscores a concerning disconnect between general knowledge and the understanding of aging. Significant misconceptions remain, particularly in domains that affect how those prosthodontists interact with older adults. The study highlights the need for targeted educational reform aimed at addressing implicit biases and enhancing the delivery of geriatric dental care.

The gender-based analysis further revealed content-specific disparities, with female trainees outperforming males on several psychosocially relevant items. This indicates the need for more targeted curricular interventions that go beyond factual instruction to include reflective learning, intergenerational interaction and ethical discourse on aging.

As prosthodontists increasingly serve an aging population, ensuring trainees possess both the knowledge and attitudes necessary for equitable, person-centered care is vital. Addressing these gaps at the educational level is a critical step toward modifying un-

spoken bias and improving outcomes in geriatric dental practice. This study tested two null hypotheses concerning knowledge of aging among postgraduate prosthodontic trainees: that no significant differences exist in FAQ scores based on gender or academic cohort. The results supported both null hypotheses. These findings suggest a consistent level of knowledge about aging among trainees, regardless of demographic or temporal variables.

Therefore, integrating gerodontology into postgraduate training as well as undergraduate education is essential for preparing prosthodontists to provide ethical, effective and customized dental care to the growing elderly population. Moreover, this improvement in gerodontology might positively influence student perceptions of age and aging.

Addressing these issues requires a dual-pronged educational approach: factual reinforcement and attitudinal awareness. Incorporating FAQ-like tools in formative assessments and reflective sessions can foster deeper engagement with the lived realities of older adults and improve patient-centered care outcomes. Future research should explore longitudinal impacts of such interventions on clinical behavior and patient outcomes.

Significance of the Study

This study provides valuable insight into the knowledge and attitudes of postgraduate prosthodontic trainees toward aging; a topic that remains underexplored in dental teaching. This study serves as a foundation for curriculum reform and further research into the integration of geriatric competencies in dental clinical teaching.

Conflict of Interest

There are no potential conflicts of interest to declare in this paper.

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Declaration

This manuscript was not drafted with the assistance of an AI language model (ChatGPT). All content was reviewed and approved by the author.

Institutional Review Board Statement

Not applicable for studies not involving humans or animals.

Informed Consent Statement

Not applicable.

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