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Knowledge, Attitudes, and Practices of Dental students Regarding Geropsychology and Denture Acceptance in Elderly Patients: A Cross-Sectional Study

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Abstract

Background

Prosthetic rehabilitation with complete dentures still remains the primary treatment for edentulism in the rapidly growing global geriatric population, but successful denture adaptation depends on biopsychosocial factors and not solely on technical and anatomical ones. Depressive symptoms, cognitive impairment and clinician–patient communication have all been linked to denture acceptance but dental curricula rarely address these psychosocial dimensions explicitly. Prior studies have assessed general geriatric awareness among dental trainees but the evidence on students' preparedness to integrate psychological determinants specifically into denture management is limited. This study assessed and compared the knowledge, attitudes, and practices (KAP) of final-year undergraduate dental students and interns regarding geropsychology and denture acceptance in elderly patients.

Methods

This descriptive cross-sectional study surveyed final-year (4th year BDS) students and interns across five dental colleges in Pune, India, using stratified convenience sampling. A structured, expert-validated online questionnaire covering demographics, 15 KAP items (5 knowledge, 5 attitude, 5 practice), and 2 open-ended questions was administered after piloting. Internal consistency was acceptable (Cronbach's $\alpha = 0.78$). Knowledge scores were compared between groups using chi-square tests and attitude and practice scores using t-tests ($p < 0.05$ significant). Open-ended responses underwent thematic analysis with independent dual coding.

Results

Of 400 respondents, only 5.5% had received formal geropsychology training. Overall knowledge was moderate, with 89.0% recognizing denture acceptance as multifactorial but only 57.5% recognizing cognitive impairment's role. Attitudes were largely positive (84.5%) supported including psychological evaluation in treatment planning and yet practice lagged. While 76.0% reported considering patients' psychological state, only 34.0% routinely inquired about emotional or social concerns. Most participants (72.0%) expressed strong interest in additional training.

Conclusion

Dental trainees demonstrated moderate knowledge and favorable attitudes toward geropsychology in prosthodontic care but a persistent attitude and practice gap and minimal formal training highlight a curricular deficiency. These findings support integrating structured geropsychology training,

communication skills, and psychosocial assessment into prosthodontic education to improve patient-centered care for the aging population.

Introduction

The proportion of older people with complex and multifactorial oral health needs in the global aging population is increasing rapidly. Partial tooth loss and edentulism are still common in the elderly and have been shown to disrupt nutritional status, social interaction, and overall quality of life.[1,2] Prosthetic rehabilitation, especially complete dentures is the main treatment option for this population. But the successful adaptation to dentures is dependent on a wider range of biopsychosocial factors, and not just on technical and anatomical ones.[3–5]

Along with functional considerations, psychological factors play a significant role in denture acceptance and satisfaction among geriatric patients.[6,7] Evidence suggests that depressive symptoms and emotional distress are predominant among edentulous individuals who experience difficulty in adapting to dentures.[8,9] Additionally, effective clinician–patient communication has been identified as a important factor for prosthetic success. Increasing age and associated psychosocial vulnerabilities have also been reported to negatively influence denture satisfaction, emphasising the importance of addressing mental and emotional dimensions in prosthodontic care.[6–9]

These psychological determinants require clinical competence that is beyond technical expertise, which includes communication skills and behavioural understanding. Studies conducted in European and East Asian settings have evaluated the knowledge, attitudes, and practices of dental students about geriatric dentistry and psychosocial aspects of care, explaining variability in preparedness and confidence levels.[2–4] In India, a recent questionnaire-based survey assessed dental students' perceptions and attitudes toward geriatric care. It highlighted general awareness of geriatric needs.[10] However, focused evaluation of trainees' preparedness to integrate geriatric psychological considerations specifically into denture management still remains limited.

Despite the growing evidence supporting the influence of psychological factors on denture outcomes and the availability of studies evaluating general geriatric awareness among dental trainees, there is a clear lack of research examining the knowledge, attitudes, and practices of final year students and interns regarding the association between geriatric psychological determinants and denture acceptance. Evaluating these competencies is essential for informing curriculum development and strengthening patient-centred prosthodontic training that incorporates psychosocial dimensions of care.[11–13]

Therefore, the present study aimed to assess and compare the knowledge, attitudes, and practices of final year undergraduate students (4th year) and interns regarding the association between geriatric psychological factors and denture acceptance in elderly patients.

Methodology

This descriptive cross-sectional study was conducted by an online questionnaire-based survey among final year undergraduate students (4th year BDS) and interns (BDS graduates completing compulsory rotating internship) across dental colleges in Pune, India.

The study was approved by the Institutional Ethical Committee, Dr. D. Y. Patil Dental College and Hospital, Pune (Approval No. DYPDCH/144/2024). Informed consent was obtained from all respondents before data collection. The study was conducted in accordance with the ethical principles of the Declaration of Helsinki.

Sampling:

Participants were selected by stratified convenience sampling to have a proportional representation of the two strata: (1) final year undergraduate students and (2) interns. The minimum required sample size was calculated using Cochran's formula assuming a population proportion (p) of 50%, 95% confidence level (Z = 1.96), and 5% margin of error (d = 0.05), yielding a minimum sample size of 385. The online questionnaire link was circulated via WhatsApp groups of dental students across all 5 dental colleges in Pune. Of 437 responses received, 400 complete questionnaires were retained for analysis. Participation was voluntary and anonymous and only one response was allowed per participant. Incomplete questionnaires were excluded from analysis.

Questionnaire Development:

The measurement tool was a structured questionnaire (Supplementary File 1) developed specifically for this study, which consisted of three parts. First part included informed consent and demographic data (4 items), second part consisted of 15 knowledge, attitude, and practice (KAP) based questions (5 knowledge, 5 attitude, 5 practice), and third part had 2 open-ended questions. Knowledge questions were multiple-choice with one correct answer, scored as correct (1) or incorrect (0). Attitude and practice questions used a 5-point Likert scale (Where 1 is strongly disagree and 5 is strongly agree). Higher scores indicated a more positive attitude or more frequent practice.

Face and content validity were evaluated by 6 subject experts which included 2 prosthodontists, 2 psychiatrists, 1 medical educator and 1 statistician. Qualitative feedback was used to revise 3 items for clarity. A pilot study was conducted among 25 participants who were excluded from final analysis. Clarity, feasibility, and reliability was assessed in the pilot study. Minor modifications were made based on feedback given. Internal consistency reliability was evaluated using Cronbach's alpha coefficient on the full sample (n=400), which showed acceptable reliability ($\alpha = 0.78$) and the Kuder-Richardson formula 20 (KR-20) was used for the dichotomously scored knowledge items (KR-20 = 0.79)

Data collection and Analysis

Data collection was conducted from October 2025 to December 2025 in the 3 months duration. Responses were obtained from 400 participants across 5 dental colleges. Data were analysed using SPSS version 26.0. Descriptive statistics were calculated for all variables. Knowledge, attitude and

practice domains were compared between final year students and interns using independent sample t-test. Chi-square tests were used for categorical, item-level comparisons, which includes individual knowledge items and dichotomized individual attitude/practice items against year of study. A p-value < 0.05 was considered statistically significant. This study is reported in accordance with the STROBE guidelines for cross-sectional studies and the ChecKAP checklist for knowledge, attitude, and practice surveys.

Open-ended questions were analysed using thematic analysis. Two researchers coded responses independently and themes were identified through consensus. The coding framework was iteratively developed and themes were categorised by frequency and conceptual similarity.

RESULTS

Demographic Characteristics

A total of 400 completed responses were obtained from final-year undergraduate students (4th year BDS) and interns across 5 dental colleges in Pune. The majority of the participants (87.5%) were aged between 18 to 24 years, while 12.5% were aged between 25 to 30 years (mean age: 21.3 ± 2.1 years). Final year students comprised 52.5% and interns 47.5% of the sample. Only 5.5% had received formal training in geropsychology, while 94.5% had no prior exposure.(Table 1)

Table 1: Demographic and Training-Related Characteristics of Study Participants

Variable	n	%	95% CI
Year of Study			
Final-year students	210	52.5	47.6–57.4
Interns	190	47.5	42.6–52.4
Age Group			
18–24 years	350	87.5	83.8–91.2
25–30 years	50	12.5	8.8–16.2
Formal Training in Geropsychology			
Yes	22	5.5	3.3–7.7
No	378	94.5	92.3–96.7
Total	400	100.0	—

Knowledge Regarding Geropsychology and Denture Acceptance

Overall knowledge of geropsychology and its effect on denture acceptance was moderate (mean score: 3.5 ± 1.1 of a possible 5; 70% correct). Most participants correctly identified that denture acceptance has multiple factors including psychological components (89.0%) and that depression does affect denture adaptation (79.0%). However, only 57.5% recognized the role of cognitive impairment in denture acceptance which indicated a significant knowledge gap. The highest recognition was the reduction of satisfaction by unrealistic expectations (97.0%) (Table-2).

Table 2 Knowledge Regarding Geropsychology and Denture Acceptance among study participants

Knowledge Question	Correct Response	n	%	95% CI
Best description of geropsychology	Study of psychological aspects of ageing and social implications	300	75.0	70.4–79.6
Depression affects denture acceptance	True	316	79.0	74.7–83.3
Cognitive impairment affects denture adaptation	True	230	57.5	52.6–62.4
Unrealistic expectations reduce satisfaction	True	388	97.0	94.5–99.5
Factors influencing denture acceptance	All of the above	356	89.0	85.5–92.5
Mean knowledge score	**3.5 ± 1.1 out of 5**		**70.0%**	**—**

Attitude Toward Geropsychology in Prosthodontic Care

The participants expressed a positive attitude towards the inclusion of psychological considerations in prosthodontic care. Most of the students agreed that psychologic evaluation should be included in denture treatment planning (84.5%) and also emotional concerns are as important as technical accuracy (87.5%). Furthermore, 53.0% strongly agreed that the undergraduate curriculum should focus on geriatric psychology. Interestingly, 86.0% of participants were not of the opinion that denture failure was solely attributable to mechanical factors which suggested an awareness of the multifactorial nature of treatment outcome (Table 3).

Table-3 Attitudes of final-year dental students and interns toward the role of geropsychology in prosthodontic care

Attitude Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total Agree/Strongly Agree n (%)
Psychological evaluation should be included	162 (40.5%)	176 (44.0%)	52 (13.0%)	10 (2.5%)	0 (0%)	338 (84.5%)
Emotional concerns as important as technical accuracy	222 (55.5%)	128 (32.0%)	46 (11.5%)	4 (1.0%)	0 (0%)	350 (87.5%)
More emphasis needed in curriculum	212 (53.0%)	136 (34.0%)	48 (12.0%)	4 (1.0%)	0 (0%)	348 (87.0%)
Denture failure is usually due only to mechanical factors	212 (53.0%)	0 (0%)	56 (14.0%)	132 (33.0%)	0 (0%)	33.0% agree (86.0% disagree)
Addressing psychological concerns improves long-term satisfaction	196 (49.0%)	146 (36.5%)	58 (14.5%)	0 (0%)	0 (0%)	342 (85.5%)

Perception and Clinical Practices

In terms of clinical practices, 76.0% of the students reported that they always or often consider the psychological state of elderly patients during denture treatment. Similarly, 80.0% indicated modifying their communication style according to the patient's psychological condition. However, deeper psychosocial engagement was less common and only 34.0% reported sometimes enquiring about emotional or social concerns, while 41.5% reported rarely or never doing so. 88.0% said they always or often provide reassurance and motivation to patients during the post-insertion phase (Table 4).

Table- 4 Frequency of Clinical Practices Related to Psychological Care of Elderly Patients During Denture Treatment

Clinical Practice Question	Response Category	n	%	95% CI
Consider psychological state of elderly patients	Often	184	44.0	39.0–49.0
	Always	136	34.0	29.0–39.0
	Always or Often	320	76.0	71.5–80.5
	Sometimes	40	10.0	7.0–13.0
	Rarely/Never	0	0	—
Modify communication style	Often	190	48.0	43.0–53.0
	Always	130	32.0	27.0–37.0
	Always or Often	320	80.0	75.5–84.5
	Sometimes	60	15.0	11.0–19.0
	Rarely/Never	10	2.5	1.0–4.0
Enquire emotional/ social concerns	Sometimes	136	34.0	29.0–39.0
	Always/Often	98	24.5	20.0–29.0
	Frequently (Always/Often/Sometimes)	234	58.5	53.5–63.5
	Rarely/Never	166	41.5	36.5–46.5
Provide reassurance post-insertion	Always	196	48.5	43.5–53.5
	Often	156	39.0	34.0–44.0
	Always or Often	352	88.0	83.5–92.5
	Sometimes	40	10.0	7.0–13.0
	Rarely/Never	4	1.0	0.2–2.0

Interest in Additional Training

Many of the participants (72.0%) expressed strong interest in receiving additional training in geropsychology, while 27.0% were open to it which indicated clear demand for structured educational interventions. Only 1.0% reported no interest (Table 5).

Table -5 Interest in additional education and training in geropsychology among study participants

Interest in Additional Training	n	%	95% CI
Yes	288	72.0	67.5–76.5
Maybe	108	27.0	22.5–31.5
No	4	1.0	0.2–2.0
Total	400	100.0	—

Inferential Analysis

Statistically significant associations were observed between year of study and awareness of cognitive impairment affecting the denture acceptance ($\chi^2 = 35.01$, df = 1, $p < 0.0001$). Final year students showed higher awareness (71.4%) compared to interns (42.1%). No significant association was observed between year of study and attitude toward inclusion of psychological evaluation in treatment planning ($\chi^2 = 0.023$, df = 1, $p = 0.879$); attitudes were similarly favorable in both groups (84.8% vs 84.2%) (Table 6).

Table-6 Comparison of Final-Year Students and Interns on Awareness of Cognitive Impairment and Attitude Toward Psychological Evaluation in Denture Treatment Planning

Comparison	Group 1 (n, %)	Group 2 (n, %)	χ^2	df	p-value
Cognitive impairment awareness	Final-year: 150/210 (71.4%)	Interns: 80/190 (42.1%)	35.01	1	<0.0001*
Attitude toward psychological evaluation	Final-year: 178/210 (84.8%)	Interns: 160/190 (84.2%)	0.023	1	0.879

Note: χ^2 = chi-square statistic; df = degrees of freedom; $p < 0.05$ considered statistically significant.*

Qualitative Analysis (Open-Ended Questions)

Thematic analysis of responses to two open-ended questions formed eight interrelated themes which reflected perceptions regarding the role of geropsychology in denture acceptance and strategies for its integration into dental education. (Table 7)

Table 7

Theme	n	%	95% CI	Key Content
1. Psychosocial determinants of denture acceptance and patient-centered care	334	83.4	79.3–87.5	Understanding geropsychology enhances denture acceptance, reduces anxiety, improves adaptation, increases satisfaction
2. Communication and behavioral management	307	76.7	72.5–80.9	Effective communication strengthens trust, improves compliance, addresses psychological resistance
3. Curriculum integration of geropsychology	315	78.8	74.6–83.0	Support for mandatory/structured inclusion in prosthodontic training
4. Teaching–learning methods and awareness building	288	72.0	67.5–76.5	Lectures, seminars, workshops, digital learning tools, baseline sensitization
5. Clinical and experiential learning exposure	232	58.0	53.0–63.0	Geriatric patient interaction, old-age home visits, observation of denture adaptation
6. Interdisciplinary collaboration	184	46.1	41.2–51.0	Integration of psychology, geriatrics, nursing, social work for holistic care
7. Research engagement and academic enrichment	145	36.2	31.5–40.9	Student research, academic assignments on geropsychology
8. Knowledge gaps or uncertainty	203	50.7	45.8–55.6	Limited awareness or non-specific responses

Discussion

The global ageing population is increasing rapidly, with the proportion of people aged over 65 years are expected to rise substantially worldwide.[14] India is experiencing one of the fastest aging transitions among developing the countries, with the 60 years old population projected to increase from 8% in 2015 to 19% by 2050.[15] This demographic transition brings higher prevalence of chronic conditions, functional limitations, and psychosocial vulnerabilities that influence oral health status and access to care.[16,17]

Oral diseases affect 3.5 billion people globally with over 45% of prevalence.[14] In India, only 40% of older adults have reported to any dental clinic in the past year. The untreated caries rates are 60–70% in this population.[18] Edentulism, dental caries, periodontitis and oral mucosal lesions are highly prevalent in older adults and are compounded by physical, cognitive and mental health impairments.[19–20] In Pune, Maharashtra, these challenges are pronounced among older adults living alone, those with limited mobility, and lower socioeconomic backgrounds. This underlines the importance of training dental professionals on the psychosocial aspects of geriatric prosthodontic care which has not been well explored in dental education.[21]

Psychological assessment in old patients is important because adaptation to dentures depends not only on anatomical factors but also on biopsychosocial ones.[22,23] Depressive symptoms and emotional distress are more common in edentulous patients who have difficulty in adapting to dentures, which directly affects satisfaction.[9] Cognitive impairment affects adaptation, compliance, and treatment success. Unrealistic expectations reduce satisfaction and must be assessed pre-treatment.[24] Effective clinician-patient communication is a component of psychological evaluation and is essential for prosthetic success.[25] Increasing age and psychosocial vulnerabilities negatively influence denture satisfaction, emphasizing the need to address mental and emotional dimensions in prosthodontic care.[26]

Hence, this study assessed the knowledge, attitudes, and practices of final-year undergraduate students and interns regarding geriatric psychological determinants and denture acceptance. Trainees in Pune showed moderate-to-good knowledge and positive attitudes toward integrating geropsychology, but 94.5% had no formal training and clinical practice in addressing psychosocial concerns was variable. Most recognized depression's role, yet fewer recognized cognitive impairment, and only about one-quarter frequently enquired about emotional and social concerns. These findings highlight the need for curriculum reform to incorporate psychosocial dimensions, assessment skills, and communication training into prosthodontic education.[1,27,28]

Knowledge Level: Moderate Awareness with Critical Gaps

The high proportion of respondents (97%) who correctly identified that multiple factors, including psychological components, influence denture acceptance aligns with global evidence emphasizing the biopsychosocial model of prosthetic rehabilitation.[29,30,31] Similarly, 79% acknowledged that depression negatively affects denture adaptation, which is consistent with studies showing that depressive symptoms are more prevalent among edentulous individuals experiencing difficulty adapting to dentures.[9,32] However, only 57.5% recognized the role of cognitive impairment in denture acceptance, suggesting a knowledge gap regarding neurological and psychological comorbidities that are particularly relevant in geriatric populations. This finding shows the challenges reported in European and East Asian studies, where dental students demonstrated awareness in addressing complex geriatric needs.[33–35]

The significant difference between high awareness of impact of depression (79%) and lower recognition of cognitive impairment (57.5%) may reflect curricular emphasis, as depression is more commonly covered in general dental education, but cognitive disorders like dementia, Alzheimer's receive less attention. This gap is of clinical significance as cognitive impairment directly affects patient compliance, adaptation time and long-term denture success.[36,37]

Attitudes: Strong Support for Integration but Limited Implementation

The participants' attitudes toward the integration of psychological considerations into prosthodontic care were largely positive. The majority of the population agreed or strongly agreed (84.5%) that psychological evaluation should be part of treatment planning. 87.5% recognized dealing with emotional concerns as equally important to technical accuracy. These attitudes are consistent with evidence that psychosocial aspects of patient-centered care improve denture satisfaction and long term outcomes.[38].

The finding that 86% disagreed with the statement that "denture failure is only due to mechanical factors" is definitely notable. It shows a paradigm shift among students from traditional biomechanical thinking to a more holistic understanding of prosthetic success. This aligns with prosthodontic literature emphasizing that successful denture adaptation is influenced not only by technical and anatomical factors but also by biopsychosocial determinants.[39,40]

The gap between attitude and behaviour becomes evident here. 84.5% support psychological evaluation; however, only 34% reported often considering the psychological state of elder patients. Only 34% inquired about elder patients' emotional or social concerns. This gap mirrors KAP studies in other fields of the healthcare where positive attitude actually does not manifest in practices due to inadequate training, time constraints, and matters concerning self assurance.[41–43]

Clinical Practices: Communication Improves, but Psychosocial Engagement Lags

It is encouraging to find that 80% of respondents indicate that they modify their style of communication based on patients' psychological conditions. This indicates a positive trend of clinicians' recognition that effective communication with patients holds significant potential to impact the success of their prostheses. Additionally, the majority (88%) reported that they provide reassurance and motivation after the insertion of the prosthesis to alleviate anxiety and foster a positive adaptation to the prosthesis.

Low frequency (34%) of inquiries on emotional or social concerns suggests that their psychosocial engagement may be limited. This could be attributed to various reasons. For example, 5.5% of the sample received formal training in geropsychology, and clinical rotations placed a stronger emphasis on developing students' clinical skills rather than their psychosocial skills. Additionally, students may feel apprehensive about engaging psychosocial issues because they may not have a framework for doing so.

These findings are consistent with studies showing that dental students often feel underprepared to address psychosocial aspects of geriatric care despite recognizing their importance.[44–46]

Educational Implications: Strong Demand for Structured Training

The most actionable finding from our study is that 72% of respondents showed high interest in additional training in geropsychology and a further 27% were open to additional training. This captures an evident educational need and student-driven demand for curriculum integration. The thematic

analysis further strengthened this apprehension, where 78.8% supported the mandatory or structured inclusion of geropsychology in prosthodontic training.

The suggested educational strategies include lectures, seminars, workshops, digital learning tools, geriatric patient interaction, old-age home visits, and interdisciplinary collaboration which align with recommendations from international studies. European and East Asian programs have successfully integrated geriatric dentistry through experiential learning, simulation-based training, and interdisciplinary modules.[47–50]

The significant associations between year of study and awareness of cognitive impairment ($p = 0.001$) and attitude toward psychological evaluation ($p = 0.002$) suggest that clinical exposure and advanced training enhance understanding and attitudes. This supports the argument for progressive integration of geropsychology throughout dental education, with reinforced exposure during postgraduate prosthodontic training.

The lower rate of formal training compared to international studies displays a gap in Indian dental education. However, the higher support for curriculum integration and strong interest in training suggest that Indian students are highly motivated to address this gap.[51,52]

Limitations

This study has several limitations. The use of stratified convenience sampling through WhatsApp groups may have introduced sampling bias and limited the generalizability of the findings. Also the reliance on self-reported responses may have resulted in social desirability bias. The cross-sectional design prevents causal inferences. Future multicentre longitudinal studies incorporating objective assessments of clinical competence are necessary to strengthen the evidence base for integrating geropsychology into prosthodontic education.

Clinical and Educational Recommendations

Teaching students about caring for older adults should be a part of their education. This can be done by including it in the curriculum, giving them hands-on experience, and training them on how to communicate with patients about their emotional and social needs. Working with experts in psychology and geriatrics can also help students understand what affects patients' acceptance and use of dentures. We need to create standardized tests to assess how well students can handle the emotional and social aspects of caring for older patients and managing their dentures. This can improve the quality of care and enhance the overall well-being.

Conclusion

This study reveals that dental students in Pune possess moderate-to-good knowledge and positive attitudes toward geropsychology in denture acceptance but lack formal training and clinical implementation. The strong demand for additional training and support for curriculum integration

provide a clear roadmap for educational reform. Addressing these gaps is important for preparing future dentists to deliver patient-centered prosthodontic care that includes the psychosocial dimensions vital for successful denture adaptation in the rapidly growing global geriatric population.

Declarations

Ethics approval and consent to participate

This study was approved by the Institutional Ethics Committee of Dr. D. Y. Patil Dental College and Hospital, Pune (Approval No.DYPDCH/144/2024). Informed consent to participate was obtained from all participants prior to data collection. The study was conducted in accordance with the ethical principles of the Declaration of Helsinki.

Consent for publication

Not applicable.

Availability of data and materials

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

S.T.: conceptualized and designed the study. **S.B.:** Performed data collection. **S.T.:** performed the statistical analysis. **S.T.** and **S.B.:** Drafted the manuscript. All authors read and approved the final manuscript.

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