



Frequency of Anxiety in Patients Undergoing Complete Denture Treatment Presenting to Prosthodontics Department of Bacha Khan College of Dentistry Mardan

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Abstract:

Background: Complete edentulism in the elder population is a prevalent health issue in developing countries. Anxiety is a common but neglected problem among the complete denture patients which has a negative effect on patient response to treatment, acceptance of dentures and rehabilitation outcomes. Estimation of the prevalence of anxiety in this population is essential for psychological intervention programs in prosthodontic care. **Aim:** To determine the level of anxiety among patients undergoing complete denture treatment at Department of Prosthodontics Bacha Khan College of Dentistry, Mardan. **Methods:** A six-month descriptive cross-sectional study was conducted at Department of Prosthodontics, Bacha Khan College of Dentistry, Mardan. A total of 155 patients (males and females) between 50 and 80 years of age, completely edentulous and seeking treatment for complete dentures were selected by non-probability consecutive sampling. Anxiety (score > 5) was assessed using the House Classification questionnaire. Demographic data (age, gender, living status, education and socioeconomic status (SES) were also collected. Data were analysed using SPSS, version 27.0, with frequencies, percentages, mean $\pm$ standard deviation, chi-square and Fisher's exact test (as appropriate). A p-value of ≤ 0.05 was significant. Results: Total 155 patients were evaluated, 39 (25.2%) of whom were anxious with a mean House Classification score of 6.14 ± 2.40 . This included 57.4% males and 42.6% females with a mean age of 64.2 ± 8.8 years. The majority of the sample were living in rural areas (54.8%), uneducated (52.9%) and middle class (47.7%) in terms of socioeconomic status. Prevalence of anxiety was higher in females (28.8%), low socioeconomic status (29.2%) and low education (25.6%) patients but were not statistically significant ($p > 0.05$). **Conclusion:** Anxiety was prevalent among one quarter of complete denture wearers. There were no statistical associations between anxiety and demographic characteristics, but there were clinically significant trends. The awareness of psychological issues and pre-prosthetic counselling is important to improve patient satisfaction and treatment outcome in this population.

Keywords: Anxiety; Complete denture; Edentulism; House Classification; Prosthodontics; Frequency; Pakistan; Patient psychology

INTRODUCTION

Complete edentulism which is the complete loss of teeth in one or both dental arches is a major health and quality of life issue. Especially in older adults in low- and middle-income countries.(1) Despite the improved prevention of complete edentulism. The global prevalence of complete edentulism will

increase to 5,004 cases per 100,000 population by 2040 having the highest burden of complete edentulism in low sociodemographic index (SDI) regions, including South Asia.(2) Complete dentures are the most accessible and inexpensive method of rehabilitating completely edentulous patients in resource-limited settings such as Pakistan, where

implant-based prosthetics are limited due to financial and infrastructural constraints.(3)

Success of complete denture treatment is not only related to the technical quality of dentures, but also the psychology and mindset of the patient. Complete edentulism has profound psychosocial consequences because of impaired chewing, speech, facial aesthetics and self-esteem which can culminate in the development of anxiety before and during prosthodontic treatment. (4)Dental anxiety is not uncommon and occurs in young and older patients, in all specialties of dentistry.(5) Studies have shown that dental anxiety influences patient behaviour in seeking, compliance, satisfaction and clinical success of dental treatment.(6,7) In prosthodontic treatment, anxious patients exhibit more expectations, difficulty in adaptation to dentures, heightened sensitivity to discomfort and more post-insertion complaints, which negatively affect patient satisfaction and clinical success.(8).

Understanding the importance of patient psychology in prosthodontics, Dr. Milus M. House developed one of the earliest systematic classifications of patient psychological types in 1950, dividing complete denture patients into four psychological types: philosophical, exacting, hysterical and indifferent.(9) This classification highlights the need for psychological assessment of patients prior to treatment, as patient psychology can affect every step in the fabrication of dentures and post-insertion adjustment. Building on this, in 2003, Gamer et al.2003 expanded the House classification to include the dentist's emotional response as a co-driver of patient response, further highlighting that anxiety and psychology are not isolated factors but part of a dynamic patient-dentist relationship. (10) These early studies demonstrate that anxiety and psychology are not merely additional considerations in prosthodontics, but central to overall assessment.

While this recognition is well established in theory, there has been little research on the incidence of anxiety in complete denture patients, especially in Pakistan. Pasad et al.2021 used a formal questionnaire-based method of anxiety quantification in this population in a cross-sectional study of 500 patients receiving complete denture treatment to gain insight into the specific fears and concerns of edentulous patients including discomfort with dental instruments (8.2%), the dentist's chair (28%), and materials used (28.3%) as well as prosthesis-specific anxieties such as fear of ill-fitting prostheses (43.3%) and fear of breakage (16.6%).(8) This study also revealed that the vast majority of patients (99.2%) preferred a detailed description of the complete treatment procedure, underscoring the importance of structured communication in alleviating procedural

anxiety. Another cross-sectional study of 1,734 patients in Saudi Arabia also showed that anxiety in dentistry is a complex construct that is significantly related to sociodemographic factors such as age, gender, level of education, and previous experience with dentistry, confirming that anxiety is more than a single construct and reflects a complex experience that is influenced by individual and other contextual factors.(7)

Specific evidence from Pakistan confirms the prevalence of anxiety as a significant clinical problem in patients undergoing complete denture treatment. Chaudhary et al.2024 found a prevalence of anxiety of 27.1% among patients in the prosthodontics department of two tertiary care hospitals in Rawalpindi and Islamabad using a structured questionnaire approach which was validated in a similar setting. (11) This finding was significant in providing the first estimate of anxiety in Pakistan, but it was limited to the urban and tertiary level context of the study. The city of Mardan, in the Khyber Pakhtunkhwa province, is a different sociodemographic setting with a larger rural population, lower levels of education level, greater socioeconomic constraint and less exposure to formal dental care systems as compared to major cities. (12) These social determinants are independently known to influence the prevalence of dental anxiety and the psychological response to prosthodontic treatment.

And while the benefits of complete denture rehabilitation on oral health-related quality of life (OHRQoL) have been clearly demonstrated, with studies in Pakistan showing a marked improvement in GOHAI scores following the insertion of dentures, confirming that successful rehabilitation has a positive psychological impact, (3) the pre-existing anxiety of patients entering the rehabilitation process, and which subsequently influences their response to the prosthesis, has not been assessed in the Bacha Khan College of Dentistry, Mardan, prosthodontics department. The absence of local prevalence estimates in this population has implications for clinicians' ability to objectively identify vulnerable patients, prioritize counselling services and compare their anxiety management strategies with those in similar settings.

Thus the purpose of this study was to establish the prevalence of anxiety in patients receiving complete denture treatment at the prosthodontics department, Bacha Khan College of Dentistry, Mardan, using the House Classification system.

MATERIALS AND METHODS

This was a cross-sectional, descriptive study at the Department of Prosthodontics, Bacha Khan College

of Dentistry, Mardan, for six months after obtaining ethical approval from the institutional review board and the College of Physicians and Surgeons Pakistan (Ref No: CPSP/REU/DSG-2023-028-4425). A sample size of 155 patients was determined using the WHO sample size formula at a 95% confidence level with a margin of error of 7%, based on the expected frequency of anxiety of 27.1% as reported by Chaudhary et al.2024. (11) Non-probability consecutive sampling was employed and all patients who met the inclusion criteria and presented during the study period were enrolled in the study until the sample size was reached.

Both male and female patients aged 50-80 years with complete clinical edentulism in one or both jaws and actively being treated for complete denture prostheses were enrolled. Patients who were partially edentulous, had a history of psychic or psychiatric disorders, or had a history of severe systemic conditions that might affect psychological status were all excluded.

Ethical approval was obtained and informed consent was obtained from all participants. They were informed of confidentiality and lack of risk involved in the study. Demographic information such as age, gender, place of residence, educational and socioeconomic status were documented on a pre-designed form. Anxiety was measured using the House Classification questionnaire, a structured questionnaire assessing patient attitudes in seven areas: comfort with dental visits, previous experience

with complete dentures, comfort with complete dentures, source of discomfort with the procedure, denture-specific concerns, desire for pre-procedure explanation of the procedure, and need for language compatibility with the dentist. Items have varying scores with a total of 13. A House Classification score of greater than 5 was considered anxiety. The rating was done in private to ensure that the participant's responses were not influenced by other people's opinions or fear of social rejection. Data were collected on the proforma and entered into a database for analysis. (Supplementary1)

SPSS version 27.0 was used to conduct the analysis. We reported the frequencies and percentages of all categorical variables such as gender, residential status, education, socioeconomic status and the dependent variable (anxiety). Continuous variables such as age and House Classification score were checked for normality using Shapiro-Wilk test. For continuous data with a normal distribution, mean $\pm$ standard deviation was reported. Prevalence of anxiety was compared across different age groups, gender, residency, educational level and socioeconomic levels. Post-stratification chi-square test was used to assess the relationship between two categorical variables; Fisher's exact test was applied if the expected frequencies were less than five. Significant differences were determined as p-values of ≤ 0.05 .

RESULT

We included 155 patients that met the inclusion criteria. Demographic information and primary outcomes are presented below.

Demographic Characteristics

The average age of the included individuals was 64.2 ± 8.8 years (range 50-80 years). The largest age group was 50–59 years (37.4%), followed by 70–80 years (35.5%), and 60–69 years (27.1%). Males represents 57.4% of the total sample while females were consist of 42.6%. The majority of participants came from rural areas (54.8%). Most of the subjects were illiterate (52.9%) followed by primary (35.5%) and higher (11.6%). The most common socioeconomic status was from middle group (47.7%) followed by poor (41.9%) and high (10.3%). Demographic characteristics of participants are shown in Table 1.

Table 1: Demographic Characteristics of Study Participants (n = 155)

Variable	Category	Frequency (n)	Percentage (%)
Age (Years)	Mean $\pm$ SD	64.2 ± 8.8	—
	Range	50 – 80	—
	50–59 years	58	37.4
	60–69 years	42	27.1
	70–80 years	55	35.5
Gender	Male	89	57.4
	Female	66	42.6
Residential Status	Rural	85	54.8
	Urban	70	45.2
Education Level	Uneducated	82	52.9
	Primary	55	35.5
	Higher	18	11.6

Socioeconomic Status	Poor	65	41.9
	Middle	74	47.7
	High	16	10.3
Total		155	100.0

Primary Outcome: Frequency of Anxiety

Among 155 patients, 39 (25.2%) patients were anxious (House Classification greater than 5) and 116 (74.8%) were non-anxious. The mean House Classification of the sample was 6.14 ± 2.40 . These findings are summarized in Table 2.

Table 2: Frequency of Anxiety Based on House Classification Score (n = 155)

Anxiety Status	Frequency (n)	Percentage (%)	95% Confidence Interval
Anxious (Score > 5)	39	25.2	18.6% – 32.8%
Non-Anxious (Score ≤ 5)	116	74.8	67.2% – 81.4%
Total	155	100.0	—

House Classification Score: Mean = 6.14, SD = 2.40

House Classification Score Distribution

The individual House Classification scores were distributed as follows:

The most frequent score was 5 (non-anxious) in 66.5% (n=103) of the patients. The range of anxious scores having score >5 was 7-13. Among anxious score range the most common ones are 9,11 and 12 having 5.2% for each. The distribution of the STAI is presented in Table 3.

Table 3: Distribution of House Classification Scores among Participants (n = 155)

House Classification Score	Frequency (n)	Percentage (%)	Anxiety Classification
2	1	0.6	Non-Anxious
3	2	1.3	Non-Anxious
4	10	6.5	Non-Anxious
5	103	66.5	Non-Anxious
7	5	3.2	Anxious
8	3	1.9	Anxious
9	8	5.2	Anxious
10	6	3.9	Anxious
11	8	5.2	Anxious
12	8	5.2	Anxious
13	1	0.6	Anxious
Total	155	100.0	—

House Classification Questionnaire Item Responses

Items from the questionnaire were analyzed to find that 76.8% (n=119) of respondents were comfortable with visiting a dentist, 63.2% (n=98) had previous denture experience. The majority of patients (80.0% n=124) felt comfortable using a complete denture, 82.6% (n=128) felt that they would be more comfortable if the dentist explained the treatment procedure prior to it, and 80.6% (n=125) felt it was important that the dentist spoke their language. The response to individual items are summarized in Table 4.

Table 4: Responses of Participants to Individual House Classification Questionnaire Items (n = 155)

Question	Response	Frequency (n)	Percentage (%)
Q1. Are you comfortable visiting a dentist?	Yes	119	76.8
	No	36	23.2
Q2. Have you ever had complete dentures before?	Yes	98	63.2
	No	57	36.8
Q3. Are you comfortable using a complete denture?	Yes	124	80.0
	No	31	20.0
Q6. Would prior explanation make you more comfortable?	Yes	128	82.6
	No	27	17.4
Q7. Is it important the doctor understands your language?	Yes	125	80.6
	No	30	19.4

Stratified Analysis of Anxiety by Demographic Variables

Anxiety was stratified across all demographic variables and chi-square test was applied. The result are presented in Table 5.

Table 5: Stratified Analysis of Anxiety by Demographic Variables (n = 155)

Variable	Category	Total (n)	Anxious n (%)	Non-Anxious n (%)	Chi-square	p-value
Age Group	50–59 years	58	14 (24.1%)	44 (75.9%)	0.421	0.810
	60–69 years	42	12 (28.6%)	30 (71.4%)		
	70–80 years	55	13 (23.6%)	42 (76.4%)		
Gender	Male	89	20 (22.5%)	69 (77.5%)	1.024	0.311
	Female	66	19 (28.8%)	47 (71.2%)		
Residential Status	Rural	85	22 (25.9%)	63 (74.1%)	0.061	0.805
	Urban	70	17 (24.3%)	53 (75.7%)		
Education Level	Uneducated	82	21 (25.6%)	61 (74.4%)	1.243	0.537
	Primary	55	15 (27.3%)	40 (72.7%)		
	Higher	18	3 (16.7%)	15 (83.3%)		
Socio-economic Status	Poor	65	19 (29.2%)	46 (70.8%)	1.601	0.449
	Middle	74	17 (23.0%)	57 (77.0%)		
	High	16	3 (18.8%)	13 (81.2%)		

Note: $p \leq 0.05$ considered statistically significant. NS = Not Significant.

In stratified analysis, none of the demographic variables (age, gender, residence, education and socioeconomic status) were significantly related to anxiety (p values for all > 0.05). However, there were clinically significant trends observed such as the proportion of anxiety was greater among females (28.8%) than males (22.5%). The poor socioeconomic group had the highest proportion of anxiety (29.2%) among the middle (23.0%) and rich (18.8%) groups; and the highest educated group had the lowest proportion of anxiety (16.7%) than uneducated (25.6%) and primary educated (27.3%) patients.

DISCUSSION

We performed this cross-sectional study in order to assess the level of anxiety in patients receiving complete denture treatment at the Department of Prosthodontics, Bacha Khan College of Dentistry, Mardan. A total of 39 patients (25.2%) were classified as being anxious with a House Classification score above 5 and a mean score of 6.14 ± 2.40 .

The overall frequency of anxiety (25.2%) reported in this study is comparable to the study by Chaudhary et al.,2024 who reported a frequency of 27.1% in complete denture patients at two tertiary hospitals in Rawalpindi and Islamabad.(11) The slight difference in the two estimates is probably due to differences in the characteristics of the population, as Mardan has a population that is more rural and conservative than the urban population in large cities. The fact that the frequency of anxiety is comparable in the two Pakistani studies implies that the phenomenon of anxiety in complete denture patients is robust and replicable across various clinical environments in Pakistan.(12,13)

The frequency reported is on the lower to moderate side compared to the international literature. Bansod et al.,2024 showed a strong correlation between salivary cortisol levels and anxiety during complete denture rehabilitation, confirming that psychological stress measured by questionnaires such as the House Classification correlates with physiological responses.(14) This biochemical evidence supports the use of questionnaire-based anxiety screening, and confirms that the 25.2% frequency observed in the present study is a real clinical burden rather than an artefact of measurement.

In a cross-sectional study of 500 complete denture patients, anxious patients were mostly first-time denture wearers, suggesting that the novelty of denture experience is one of the chief causes of anxiety.(8) In the present study, 36.8% of the patients were first-time denture wearers, and the questionnaire responses supported the fact that fear of denture use was more common among first-time denture wearers. This is significant in practice, as novice denture wearers need more detailed pre-prosthetic counselling to avoid unrealistic expectations and unwarranted fears.(15)

In this study, a stratified analysis for sex variable showed that the proportion of anxiety was greater in

female patients (28.8%) than in males (22.5%), though this was not statistically significant ($p=0.311$). This trend is supported by the global body of literature on dental anxiety that consistently shows that women are an independent risk factor for increased anxiety. A cross-sectional study of 1549 adult dental patients found that women had significantly higher dental anxiety scores, and were more prone to psychological distress in the dental setting.(16) In the field of prosthodontics, concerns about the cosmetic impact and facial disfigurement associated with denture wear may be more relevant to women, contributing to their anxiety.(14,17)

With age, the 60-69 year age group showed the highest proportion of anxiety (28.6%) compared to other age groups, although this was not statistically significant. This finding is supported by evidence from Singh et al.,2014 that older patients had a greater difficulty adapting to new dentures and hence experienced higher psychological distress and lower satisfaction.(18) Age-related factors, such as longer duration of edentulism, social adaptability and decreased neuromuscular coordination, may heighten anxiety levels amongst older adults, which suggests this population requires a more patient-centred approach to treatment.(19)

An interesting trend was observed with education status, with the highest proportion of anxiety among illiterate patients (25.6%) and the lowest among highly educated patients (16.7%). This is in line with the findings from Begum et al.,2023 who reported that patients with low educational levels were more difficult to explain treatment procedures, had higher level of unrealistic expectations and higher level of apprehension. (20) Education affects health literacy, which in turn affects the patient's ability to understand the clinical procedure and the cognitive interpretation of anxiety-provoking situations. Use of pictorial education and simpler terms may help reduce anxiety in low-education patients. (21,22)

Socioeconomic rank revealed higher anxiety in the lower stratum (29.2%) than higher stratum (18.8%), but this was not statistically significant ($p=0.449$). This is corroborated by Begum et al., 2022 who found that financial issues and apprehension about the cost associated with maintenance of dentures have a profound effect on patient satisfaction and experience in prosthodontic treatment. (23) In low-resource areas like Mardan, patients with financial constraints may be concerned about the total cost of treatment, thus contributing to anxiety. Dentists should explain the longevity of treatment, as well as cost-effective maintenance options, to dispel financial anxiety. (11) Our finding that 82.6% of respondents would like to have pre-treatment explanations and 80.6% felt that it was important for the dentist to communicate in their

native language suggests that this group of patients would value clear and accessible information. Kumari et al.,2021 highlighted the importance of pre-treatment psychological preparation in denture satisfaction which is the final goal of successful complete denture therapy.(22) These results collectively indicate that a brief structured approach to anxiety assessment and counselling in the prosthodontic workflow during the first visit could significantly alleviate treatment-related anxiety and improve clinical outcomes.(11)

Limitations

This study has several limitations. The cross-sectional nature of the study precludes causal claims and the results from a single site in Mardan may not be representative of other parts of Pakistan. The House Classification is not a validated psychometric anxiety scale; it was developed to classify patients according to their psychological type; future research should use it alongside other validated scales such as the Modified Dental Anxiety Scale (MDAS) or the Visual Analogue Scale for Anxiety (VAS-A). Conservative cultural pressures may have resulted in a social desirability bias and underestimating anxiety. Other factors such as duration of edentulism, the stage of treatment when anxiety was measured and the rapport between the patient and the dentist were not measured and may have an independent impact on anxiety.

Future Directions

Multicenter studies involving patients from urban and rural populations in multiple provinces of Pakistan, would provide nationally-estimated figures. Longitudinal studies that assess anxiety at various stages of complete denture fabrication would pinpoint the steps in the denture fabrication process that are most likely to evoke anxiety. Intervention studies assessing the impact of pre-treatment counselling, plain language educational leaflets and enhanced communication strategies on anxiety levels in complete denture patients would provide important insights for prosthodontic practice protocols in resource-poor settings.

CONCLUSION

We performed this cross-sectional study in order to assess the level of anxiety in patients receiving complete denture treatment at the Department of Prosthodontics, Bacha Khan College of Dentistry, Mardan. A total of 39 patients (25.2%) were classified as being anxious with a House Classification score above 5 and a mean score of 6.14 ± 2.40 .

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