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Prevalence of Dental Anxiety Among Edentulous Patients Receiving Complete Denture Prosthesis

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ABSTRACT

Objective: To determine the frequency of dental anxiety among edentulous patients receiving complete dental prosthesis at a tertiary care Hospital.

Methodology: A descriptive cross-sectional study was conducted in the Department of Prosthodontics, from January to June 2024. Individuals with completely edentulous of either gender, aged between 30 and 70 years, visiting the Prosthodontics department for complete denture treatment, were included. Subsequently all the individuals were assessed for anxiety using the Modified Dental Anxiety Scale (MDAS). Statistical analysis was performed using SPSS version 26, taking significance level at $p < 0.05$.

Results: Overall 87 participants were enrolled with mean age of 56.23 ± 8.87 years and a mean duration of edentulism of 3.91 ± 2.51 years. Males were (47.1%) and 46 (52.9%) were females. Overall prevalence of anxiety was noted 43.20%, particularly mild anxiety was in 23%, moderate anxiety was 12.60% and severe anxiety was only 5.70%. Frequency of anxiety was significantly linked to the younger patients (<50 years) contrast to older cases ($p = 0.034$), while the duration of edentulism, gender, comorbidities, and educational status showed insignificant association with dental anxiety ($p = >0.05$).

Conclusion: Dental anxiety was observed among nearly a fifth of all patients who had complete denture prostheses with complete edentulous ridge, with most common cause of discomfort with impression materials, gagging and to fear denture breakage.

Keywords: Edentulism, Prosthodontic treatment, Dental anxiety, Complete denture, Patient satisfaction, Psychological factors.

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Introduction

Dental anxiety is a psychological condition that is usually prevalent in patients who seek dental treatment. It is a feeling of anxiety or fear of dental care which can be weak and less phobic or a severe phobic one. This anxiety may give rise to dental phobia, late hospitalization as well as aggravation of the oral health condition which in effect affect the overall condition of a patient.[1,2] Despite the improvement of dental ways, supplies and handling processes, many people still develop a lot of fear towards such a dental procedure.

Anxiety especially occurs in the case of totally edentulous patients where the practice of complete denture fabrication is being undertaken. This category of patients undergoes stress mostly because of the protracted clinical sessions, fear of pain during impression taking, gag reflexes and doubts about treatment outcomes.[3,4] Dental anxiety may have a detrimental effect on communication between the dentist and the patient, decrease the amount of cooperation during the treatment, and the ability to successfully adapt to dentures and remain satisfied in the long- term.[5] It has been demonstrated in earlier research that anxious patients tend to report low tolerance of impressions,

inability to adapt to new dentures, and dissatisfaction despite technically satisfactory prostheses.[6]

Dental fear has a complicated and multifactorial ethology. Anxiety is developed due to factors that include previous painful experiences, fear of injections, sensitivity to dental instruments or materials and the psychological vulnerability among others.[7] Age, gender, educational level, and socioeconomic status can also be considered demographic factors that could affect the perception of dental procedures in people, yet the current research results are inconclusive.[8,9] The prevalence of dental anxiety among adults has been reported worldwide, ranging between 10 and 25% of the entire population with geographical variations and among different clinics.[10,11] Although younger adults tend to show more dentally feared responses, older adults, especially the ones with edentulous, can express anxiety regarding the prosthetic treatment, based on functional and aesthetic issues.[12]

It is imperative to undergo the scope and factors of dental phobia in edentulous patients to maximize the outcome of the treatment in prosthodontics. Complete denture fabrication takes several visits to the office of the patient and involves complicated processes, without patient cooperation and psychological preparedness, it will not be successful. Recognizing anxiety causes and managing them using empathic communication, behavioral and patient education may lead to increased treatment acceptance and comfort.[13,14] Generally, dental anxiety encompassing anticipatory fear, procedural distress, and avoidance behavior is a well-documented barrier to successful dental treatment; however, despite its clinical relevance, it remains understudied in this population especially in the South Asian population where dental visits are late and prosthetic requirements are high. On the left unaddressed, it may influence clinical procedures, cooperation of the patients, and compromise the outcomes of treatment. However present study was planned to evaluate the prevalence and determinants of dental anxiety in edentulous individuals and its impact on prosthetic outcomes.

Methodology

The present descriptive cross-sectional study was carried out at the Department of Prosthodontics, Institute of Dentistry, LUMHS, Jamshoro, from January to June 2024, after approval of the proposal from CPSP and the Ethical Review Committee (ERC) of LUMHS, Jamshoro (No. LUMHS/REC/119 dated 16-08-2023). All completely edentulous patients of either gender, aged between 30 and 70 years, visiting the Prosthodontics Department for complete denture treatment were included. On the other hand, cases with partial dentition, cognitive impairment, inability to understand or complete the questionnaire, uncontrolled medical conditions, history of severe mental health disorders, and patients with acute dental pain or infection were excluded.

The OpenEpi sample size calculator for proportions was used to determine the required sample size, which was calculated to be 87 participants based on a prevalence of dental anxiety of 7.43%, a 5% margin of error, and a 95% confidence level. The study participants were selected through a non-probability convenience sampling method, and written informed consent was obtained before the start of the study.

Subsequently, all participants were assessed for anxiety using the Modified Dental Anxiety Scale (MDAS), which is one of the most widely used and validated instruments and comprises five self-reported items evaluating patient anxiety across key clinical scenarios, including anticipation of treatment, receipt of local anaesthesia, and use of dental instruments. Each item was scored on a five-point scale, with the total score ranging from 5 to 25. Scores ranging from 5 to 10 were defined as mild anxiety, scores from 11 to 18 as moderate anxiety, and scores greater than 19 as severe dental anxiety.

Moreover, a structured ten-item questionnaire was used to assess anxiety levels and identify related factors among edentulous patients receiving complete denture prostheses. The questionnaire was administered during denture treatment visits to determine how patients felt during their dental visits, the causes of discomfort, previous denture experiences, and comfort level with dentures, along with anxiety related to impression-making, denture handling, and treatment barriers such as lengthy appointments, financial concerns, communication issues, and language differences.

All data were analyzed using SPSS version 26. Descriptive statistics were used to summarize variables, while associations between dental anxiety and demographic or clinical factors were tested using the Chi-square test and t-test, with the level of significance set at $p < 0.05$.

Results

The study included a total of 87 participants with a mean age of 56.23 ± 8.87 years and a mean duration of

edentulism of 3.91 ± 2.51 years. There were 41 (47.1%) male and 46 (52.9%) were female. According to House classification, the philosophical type was most prevalent (41.4%), followed by exacting (24.2%), hysterical (19.5%), and indifferent (14.9%). Most of the cases were married (54.0%), while widowed individuals were (25.3%). According to the educational status most of the individuals had middle-level education (31.0%), following by matriculation (21.8%), with a notable proportion being uneducated (17.2%). Moreover, the most frequently cited cause was the materials used during denture construction (70.6%), following by vomiting or gag reflex (58.8%) and the number of visits requirement (52.9%). However, the breakage of the denture was also substantial concern (41.2%), together with time and cost (29.4%) and (23.5%) fullness of the mouth, with less frequently reported triggers including fear of a loose denture, instruments, impression material swallowing, wearing and removing ideas of denture, breathlessness and the dental chair itself as presented in table I.

Table I: Baseline profile and causes of dental anxiety among participants (n=87)

VARIABLES		STATISTICS
Mean age (years)		**56.23 ± 8.87 (CL**=54.34-58.12)
Mean duration of Edentulous (years)		**3.91 ± 2.51 (CL**= 3.37-44)
Gender	Male	39 (44.8%)
	Female	48 (55.2%)
House Classification	Philosophical	36 (41.4%)
	Exacting	21 (24.2%)
	Hysterical	17 (19.5%)
	Indifferent	13 (14.9%)
Marital status	Divorced	07(8.0%)
	Married	47(54.0%)
	Single	11(12.6%)
	Widowed	22(25.3%)
Educational status	Graduate	07(8.0%)
	Intermediate	10(11.5%)
	Matriculation	19(21.8%)
	Middle	27(31.0%)
	Primary	09(10.3%)
	Uneducated	15(17.2%)
Causes of Dental Anxiety	Materials used	12 (70.6%)
	Sight of instruments	3 (17.6%)
	Dental chair	2 (11.8%)
	Swallowing the impression material	3 (17.6%)
	Vomiting	10 (58.8%)
	Fullness of the mouth	4 (23.5%)
	Breathlessness	1 (5.9%)
	Breakage	7 (41.2%)
	Fear of loose denture	4 (23.5%)
	Idea of wearing and removing	3 (17.6%)
	Time and Cost	5 (29.4%)
	Number of visits	9 (52.9%)

Overall frequency of anxiety was noted 43.20%, particularly mild anxiety was in 23%, moderate anxiety was 12.60% and severe anxiety was only 5.70%. Figure 1.

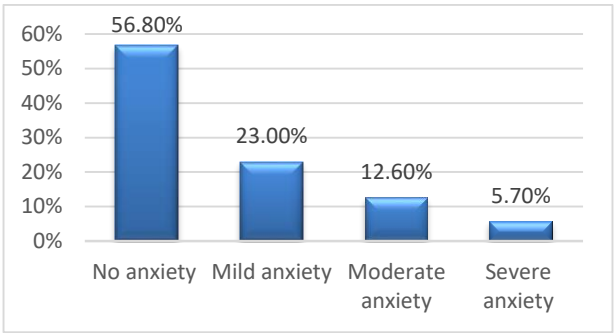


Figure 1. Frequency and severity of anxiety. (n=87)

Age group of the patients was significantly linked to the dental anxiety, with younger patients (<50 years) had higher moderate and severe anxiety in contrast to older cases (p = 0.034), while the duration of edentulism, gender, comorbidities, and educational status showed insignificant association with dental anxiety (p = >0.05). Table II.

Discussion

The Edentulism is a significant oral health burden affecting a significant proportion of the adult population throughout the world, specifically among older individuals. It is not only compromising important oral functions but also exerts a profound negative impact on psychological well-being, social confidence, and overall quality of life of the individuals. In this study overall frequency of anxiety was noted 43.20%, particularly mild anxiety was in 23%, moderate anxiety was 12.60% and severe anxiety was only 5.70% corresponds closely with the global prevalence of dental anxiety, which has been reported between 10% and 25% in various populations.[1,2]

Another national study carried out at Gilgit-Baltistan reported dental anxiety among 33.1% of the cases, with an overall mean MDAS score around 8.95 ± 2.53, reflecting a comparably some lower anxiety burden compared to this study.[15] Consistently, a multicenter study reported an average score of 11.3, with only 9.3% of individuals scoring at or above the high anxiety threshold of 19, indicating a severe dental anxiety remains a minority phenomenon across diverse populations.[16] According to the study by Alansaari AB et al[17], the dental anxiety levels in patients attending dental clinics in Dubai showed moderate anxiety highly prevalent (72.3%). Additionally, the procedural triggers

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Table II: Frequency and severity of anxiety according effect modifiers. (n=87)

Variables		Anxiety Category				p-value
		Mild	Moderate	Severe	No Anxiety	
Age groups	**≤50 years**	4	7	3	14	0.034
		4.6%	8.0%	3.4%	16.1%	
	>50 years	16	4	2	37	
		18.4%	4.6%	2.3%	42.5%	
Duration of edentulism	**1-5 years**	16	8	5	30	0.125
		18.4%	9.2%	5.7%	34.5%	
	>5 years	4	3	0	21	
		4.6%	3.4%	0.0%	24.1%	
Gender	**Female**	10	4	3	31	0.478
		11.5%	4.6%	3.4%	35.6%	
	Male	10	7	2	20	
		11.5%	8.0%	2.3%	23.0%	
Comorbidities	**Asthma**	0	0	0	2	0.868
		0.0%	0.0%	0.0%	2.3%	
	Diabetic	5	2	0	8	
		5.7%	2.3%	0.0%	9.2%	
	Epilepsy	0	1	0	1	
		0.0%	1.1%	0.0%	1.1%	
	Hypertensive	4	2	1	14	
		4.6%	2.3%	1.1%	16.1%	
	Hypertensive and diabetic	1	0	0	4	
		1.1%	0.0%	0.0%	4.6%	
	No	10	6	4	22	
		11.5%	6.9%	4.6%	25.3%	
Education	**Graduate**	0	0	1	6	0.644
		0.0%	0.0%	1.1%	6.9%	
	Intermediate	3	2	0	5	
		3.4%	2.3%	0.0%	5.7%	
	Matriculation	4	1	2	12	
		4.6%	1.1%	2.3%	13.8%	
	Middle	8	4	2	13	
		9.2%	4.6%	2.3%	14.9%	
	Primary	3	2	0	4	
		3.4%	2.3%	0.0%	4.6%	
	Uneducated	2	2	0	11	
		2.3%	2.3%	0.0%	12.6%	

identified, tooth extraction and surgical procedures were the most prominent anxiety-provoking stimuli in their study, followed by local anaesthetic injection and tooth drilling, while scaling and polishing were inked to the least degree of anxiety among patients.[16] In aligns to this series Mittal R et al[18] demonstrated that the gagging during impression-making was identified as the most common anxiety-inducing factor, in 43% of cases, followed by a sensation of fullness in the mouth (31%), fear of swallowing the impression material (14%), and breathlessness (12%). Such findings were consistent with this study, wherein materials used during impression procedures and gag reflex were similarly identified as the dominant triggers of dental anxiety among anxious individuals. Additionally, Mittal R et al[18] emphasized that the overwhelming majority of patients (91%) reported greater comfort when the clinical procedure was explained to them beforehand, and approximately 97% expressed a preference for receiving information in their native language, highlighting the critical role of effective cases communication and easy language counseling in alleviating procedural anxiety during complete denture treatment. Moreover, Raman N et al[19] also reported that the anxiety scores were most frequently distributed at score 4 (25.8%), followed by score 8 (22.4%) and score 3 (16.8%), representing a predominance of mild to moderate self-reported anxiety levels among the study cases.

In this study the anxiety was significantly higher in younger patients (<50 years) in contrast to older cases (p=0.034), which was supported by the Indian study,[20] where they demonstrated a total prevalence of dental anxiety in the first-time dental visitors around 28.7%, with anxiety levels being greater in younger groups, which aligns with the demographic pattern observed in

the present study. Additionally, according to the causes of dental anxiety identified in our anxious participants, materials used during impression-making and the gag reflex were the most prominent triggers, which is consistent with the prosthetic-specific nature of anxiety in this population, where fear of gagging and unfamiliar oral sensations rather than pain constitutes the dominant stimuli of the anxiety.[18]

Moreover, in this study the duration of edentulism, gender, comorbidities, and educational status showed insignificant association with dental anxiety ($p = >0.05$). However, Kakar MS et al[15] observed the inconsistent finding where they reported that the females had MDAS scores 2.12 times greater than males $p < 0.05$. According to another study by Pasad AK et al[21] conducted to evaluate the anxiety among cases undergoing complete denture, the distribution of anxiety scores was mostly focused at score 4 (25.8%), following by score 8 (22.4%) and score 3 (16.8%), while according to the precipitating factors of dental anxiety, the used materials during dental procedures characterized the most frequently stated cause, affecting 71.8% of the cases, followed by the sight of dental instruments (14.2%) and the dental chair (13.2%), whereas relatively few cases around (0.8%) showed that there is related to the sight of the airotor or clinical smell. There were, no more studies found reporting specific statistics on the effect of demographic variables on dental anxiety among edentulous individuals, reflecting distinguished gap in the existing literature. Generally, the few relevant studies reported varied prevalence statistics, which may be because of differences in objectives of the studies, different sample selection criteria, and clinical settings, as entirely comparable studies are infrequent. However, the parallel studies included in this discussion therefore serve as estimates rather than direct comparisons, highlighting the requirement for dedicated research in this subject. Unfortunately, this study also possesses several limitations, like cross-sectional design and relatively small sample size, which may influence the worth of findings. Hence further large-scale longitudinal research studies are very important to more comprehensively characterize the prevalence, determinants, and clinical implications of dental anxiety in edentulous cases undergoing complete denture rehabilitation.

Conclusion

Dental anxiety observed to be around two-fifths of edentulous patients undergoing complete denture prosthetic rehabilitation, demonstrating a clinically significant burden that demanding thoughtful attention within the practice of prosthodontic. Additionally, discomfort associated with impression materials, gagging reflex, and fear of denture breakage are the predominant triggers of anxiety. Proper and early identification of anxious cases, coupled with clear procedural communication and empathetic patient-centred counseling, holds considerable potential to enhance patient comfort, improve clinical cooperation, and ultimately optimize the overall effectiveness and successful management.

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