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The Prevalence of Dental Anxiety and its Relation to Oral Health Related Quality of Life among Geriatric Population with Dental Treatment Needs at a Dental College in Vadodara City: A Cross-sectional Study

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Abstract--- Background and Objectives: *Anxiety about dental treatments and fear of pain associated with dental pathologies as well as dental procedures remains widespread. The era of modern science has witnessed tremendous advancements in the field of pain control and patient management. Despite these advances, anxiety related to dental treatment and the fear of pain associated with it remain among the general population. Literature suggested that dental anxiety is also prevalent even in older age. However, very limited data available in the literature about the relationship of Dental anxiety (DA) and oral health related quality of life(OHRQoL) among geriatric population. The aim of this observational, cross-sectional study was to analyze the relationship between DA and OHRQoL in a geriatric population with dental treatment needs.*

Materials and Methods: *172 participants above 60 years of age reported to K. M. Shah Dental College and Hospital with dental treatment needs were enrolled into the study. The measurements of DA were collected by Modified Dental Anxiety Scale (MDAS) and Oral health-related quality of life (OHRQoL) was assessed with the Geriatric Oral Health Assessment Index (GOHAI).*

Results: *Total 170 participants were included into statistical analysis (two excluded due to missing key answers). No gender dependency was observed. A comparison of answers regardingDA and OHRQoL revealed a significant interdependence ($p = 0.0109$); highly anxious patients were 3.77 times more likely to suffer from poor quality of life compared with less anxious ones.*

Conclusion: *This cross-sectional study of geriatric patients seeking dental treatment at a dental college in Vadodara city found that increased dental anxiety was associated with an impaired oral health related quality of life.*

Keywords--- *Dental Anxiety, Geriatric Population, Vadodara City.*

I. INTRODUCTION

Anxiety about dental treatments and fear of pain associated with dental pathologies as well as dental procedures

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remains widespread. Anxiety associated with dental treatment has been ranked fifth among common fears in a general population.[1]

Dental anxiety (DA) relates to the psychological and physiological variations of a non-pathological fear response to a dentist's appointment or treatment.[2] The problem of dental anxiety is of superior importance for several reasons: (a) avoidance causes worse dental health; (b) anxiety and phobia has negative effect on the dentist-patient relationship, may prevent proper dental treatment, and can be a reason for failure or complications of dental procedures; and (c) higher level of anxiety results in stress, such as syncope, hypertension, tachycardia, and cardiovascular accidents.[3]This may cause impaired oral health related quality of life (OHRQoL)in the patients with increased dental anxiety.

Anxious individuals generally avoid dental visits, they are uncooperative during dental treatment procedures, cancel more dental appointments, and have a lower pain threshold. Mehrstedt *et al*[4] and Crofts-Barnes N P *et al*[5] have reported that those experiencing high levels of dental anxiety are among those with the poorest OHRQoL. A Study was done by Mcgrath C *et al*[6] to find out association between dental anxiety and OHRQoL in Britain and Quality of life was found twice bad among anxious people. Dental anxiety varies in intensity also from patient to patient. Another study was done by Mehrstedt M *et al*[7]in which they found women and young people were found to be more anxious. Results of a study done by Gisler V *et al*[8] in which 79% of participants were above 50 years of age showed 31.5% of moderate to high dental anxiety among them. Till date, in India most of the data is present on the characteristics of the dentally anxious young or middle-aged adults only. Older adults in general, and the elderly in particular, have not been the focus of dental anxiety research. Thus, this present study was conducted to evaluate influence of dental anxiety on their oral health related quality of life. So that dental anxiety problem can be addressed among them to improve their overall oral heath related quality of life in future.

II. MATERIALS AND METHODS

A study was planned to a nalyze the relationship between dental anxiety (DA) and oral health related quality of life (OHRQoL) in a geriatric population with dental treatment needs. An approval to conduct the study was obtained from the institutional ethical committee (Sumandeep Vidyapeeth, Vadodara, Gujarat, India) with approval No.: SVIEC/ON/DENT/SRP/16129. With the data obtained from a previous study done by Gisler V et al[8] in 2012 which analysed the prevalence of DA and its relation to OHRQoL in patients with dental treatment needs at a university clinic in Switzerland, minimum 160 subjects are required in the purposed study to get 3.55 times more risk of poor Oral health related quality of life in geriatric patients at 5% risk and 80% power. The patients coming to the Department of Prosthodontic and crown& bridge with dental treatment needs were screened for inclusion in the study. Patients with age of 60 years or above reported to OPD of the Department of Prosthodontics, K. M. Shah Dental College and Hospital with dental treatment needs and Patients who read, write and understand questionnaire in Hindi language were included in this cross sectional study. They were informed about the study through participant information sheet and written informed consent was taken before enrolment. Overall, 172 such consents were returned and they were administered in the study. The instrument used was self‐ administered, structured, close‐ ended questionnaires.

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To assess Dental anxiety (DA) and oral health related quality of life (OHRQoL), a single answer form was prepared which included two validated questionnaires, one related to dental anxiety and another to geriatric oral health. The questionnaires were adapted from previous studies done by Humphris G et al[9], Acharya S[10] (for Modified Dental Anxiety Scale [MDAS]) and Mathur V P et al[11] (for Geriatric Oral Health Assessment Index [GOHAI]).The reliability and validity of the MDAS and GOHAI for Indian population have been demonstrated in several previous studies[10, 11,12,13]The Modified Dental Anxiety Scale (MDAS) comprises five questions and a five scale answer to each question between 1 (Not Anxious) to 5 (Extremely Anxious) resulting in a range for the total score between 5 (No fear) to 25 (High fear).[10] The Geriatric Oral Health Assessment Index (GOHAI) is the most widely used instrument to measure OHRQoL of geriatric population. The questionnaire consists of 12 questions wherein three answers graded from 'always' (0 points) to 'never' (3 points) are attributed to each question, resulting in a possible total score between 12 to 36 points where a low score means a low OHRQoL. GOHAI expresses the extent to which the patient's oral health condition influences his or her well-being.[11, 13]

The answer of each questions of both questionnaires was obtained and data entered and stored in an electronic format as a Microsoft Excel 2013 file. For comparison, subgroup was formed in which the answers were analysed in relation to gender. In MDAS distinction between highly anxious and non-highly anxious participants was made. A cut-off value of 19 and above has been determined empirically to indicate high dental anxiety that may require special attention by dental personnel.[9, 10]OHRQoL was rated as 'good' if the GOHAI score was less than the median score and as 'poor' otherwise.[11] Linear correlation regression was done using Pearson Correlation coefficient. Effect of gender in developing dental anxiety was assessed using chi-square test.

III. RESULTS

The study was conducted in 172 individuals and their responses are recorded of MDAS and GOHAI questionnaires. Two participants were excluded because of missing key answers in MDAS scale. Observations for DA are ranged from 5 to 24. According to scoring criteria of MDAS, cut-off score ≥ 19 considered as highly anxious (phobic) patients. In the undertaken study, 16.5% (n=28) participants were found highly anxious for their dental treatment. Whereas, 83.5% (n=142) participants had low to moderate dental anxiety. Classification of participants is given in Table 1

In highly anxious participants according to MDAS score, females are more anxious than male. (n_F=17, n_M=11). However, statistical influence of subjects' gender did not found on the results of MDAS. A Chi square test answers from men vs. women resulted in p value of 0.130 (Table 2). Influence of gender was also not statistically significant in GOHAI scores. A chi square test answers from men vs. women resulted in p value of 0.878. This suggested no influence of gender on score of MDAS and GOHAI (Table 3).

Table 1: Classification of Anxious Participants According to Gender

Classification	*MDAS Score ≥19*	*MDAS Score <19*	*Total*
Male	11	78	89
Female	17	64	81
Total	28	142	170

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Table 2: Chi Square Test for MDAS Scores According to Gender

			Gender		*Total*
			F	*M*	
MDAS Score	≥19	Count	17	11	28
		% within Gender	21.0%	12.4%	16.5%
	<19	Count	64	78	142
		% within Gender	79.0%	87.6%	83.5%
Total		Count	81	89	170
		% within Gender	100.0%	100.0%	100.0%
Chi square value of 2.295 and p value of 0.130					

Table 3: Chi Square Test for GOHAI Scores According to their Gender

			Gender		*Total*
			F	*M*	
GHOHAI SCORE	<21.5	Count	41	44	85
		% within Gender	50.6%	49.4%	50.0%
	>21.5	Count	40	45	85
		% within Gender	49.4%	50.6%	50.0%
Total		Count	81	89	170
		% within Gender	100.0%	100.0%	100.0%
Chi square value of 0.024 and p value of 0.878					

Two subgroups were used to analyze the co-relation between dental anxiety and oral health related quality of life. Non- highly anxious (MDAS score < 19) and highly anxious patients (MDAS score ≥19). Similarly, the patients were allocated into two classes of either good oral health related quality of life (GOHAI score < median) or poor oral health related quality of life (GOHAI > median) (Table 4). Pearson correlation coefficient between MDAS and GOHAI scores suggested r value of -0.129 (Table 5). Which indicates a poor negative correlation between MDAS and GOHAI scores. This indicates that as MDAS score increases the GOHAI score decreases. The odds ratio was 3.77, which exhibits that highly anxious patients have a reduced OHRQoL. This results suggested that highly anxious patients were 3.77 times more likely to suffer from poor quality of life compared with less anxious ones (Table 6). The same is represented in Graph 1.

Table 4: Classification of Participants According to their MDAS and GOHAI Scores

Classification	*Highly anxious (MDAS≥19)*	*Not highly anxious (MDAS<19)*	*Total*
Poor GOHAI (Below median)	23	64	87
Good GOHAI (Above median)	5	78	83
Total	28	142	170

*MDAS: Highly anxious, MDAS ≥19, Not highly anxious MDS <19 GOHAI: Poor GOHAI- Below median, Good GOHAI- Above median

Table 6: Binary Logistic Correlation Analysis of Observations

Poor OHRQoL: Yes= Below median, No= Above median, MDAS≥ 19: Highly anxious, MDAS<19 Not highly anxious				
Correlation analysis	Pearson's correlation	Odds ratio	95% confidence interval	P- value
	-0.129	3.77	1.36, 10.49	0.0109

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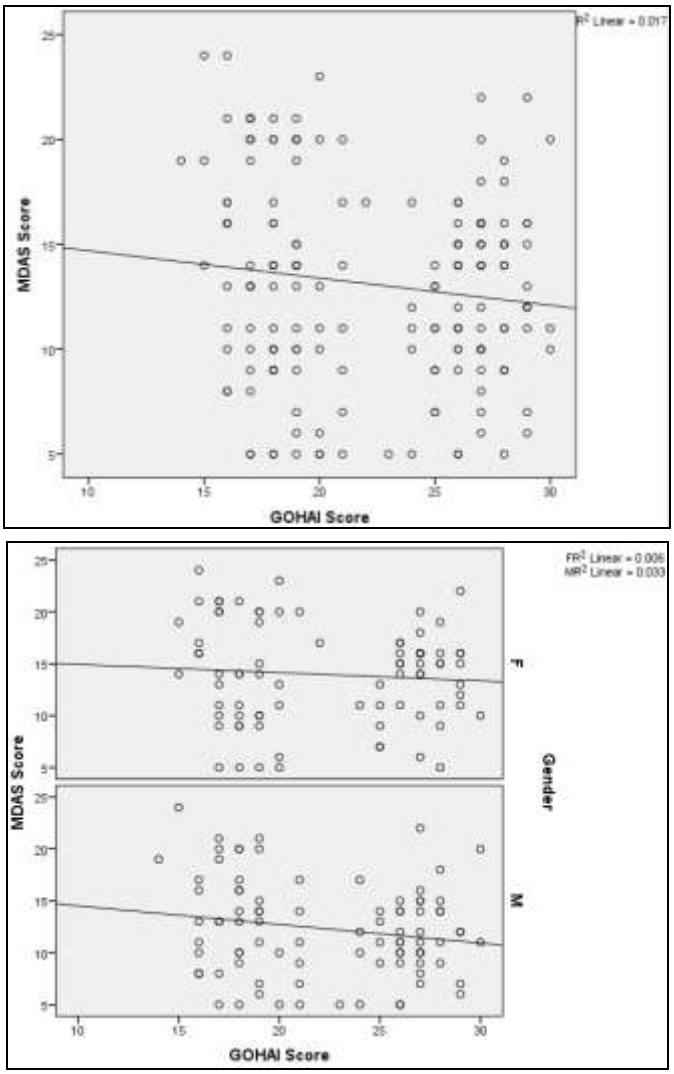

Graph 1: Scattered Diagram Showed Correlation Coefficient between MDAS and GOHAI Score and Correlation Coefficient between MDAS and GOHAI Scores According to Gender

IV. DISCUSSION

This study is the first analysis of the interdependency between Dental anxiety (DA)and oral health related quality of life (OHRQoL) in a patient sample of geriatric population. Although there is a considerable volume of literature concerning dental anxiety and quality of life, very few studies have analyzed the association between them, especially in developing countries. A study done by Gisler et al[8] in which 79% of participants were above 50 years of age showed 31.5% of moderate to high dental anxiety among them. Which suggested that dental anxiety also prevalent even in geriatric population. Therefore, the present study attempted to explore the association of oral health related quality of life with dental anxiety among the geriatric population.

Questionnaire used for the evaluation of dental anxiety in the present study was Modified Dental Anxiety Scale (MDAS) which is a most commonly used questionnaire for the subjective assessment of dental anxiety.[10] The questionnaire is a modified version of Corah's Dental Anxiety Scale (CDAS) which included five questions related

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to various dental procedure and their scores ranged from "not anxious" to "extremely anxious". The responses were scored from 1 to 5 in ascending order with increasing intensity of dental anxiety.[9]

There are various questionnaires available to assess oral health related quality of life such as Oral Health Impact Profile (OHIP-14)[14], Oral Impacts on Daily Performance (OIDP)[15], Geriatric Oral Health Assessment Index (GOHAI).[16] However, GOHAI is the most suitable questionnaire for the assessment of oral health related quality of life in geriatric population hence it is used in the undertaken study.[11]

The response rate for questionnaires was quite well. Each participant completed the answers for MDAS questionnaire. The GOHAI exhibited missing answers by few participants, probably due to fact that GOHAI items are relatively complex to answer and unfamiliar. General drawbacks of subjective surveys are the tendency of acquiescence and the fact that particularly men do not always give a sincere answer when they are asked about dental anxiety.[17] Results of present study revealed that females are more dentally anxious than males. However, the result was not found statistically significant between the genders. These results are in disagreement with a few studies[18,19] but in accordance with studies by Locker *et al*[20], Bergdahl *et al*[21] and Abrahamsson *et al*[22] The possible reason suggested in the literature was that women had a lower tolerance to pain and have higher levels of neuroticism (tendency to experience negative emotional states) than men and that anxiety was positively associated with neuroticism.[23, 24]

Two subgroups were used to analyze the co-relation between DA and OHRQoL. Non- highly anxious (DAS score < 19) and highly anxious patients (DAS score ≥19). Similarly, the patients were allocated into two classes of either good oral health related quality of life (GOHAI score < median) or poor oral health related quality of life (GOHAI > median). In the present study, total 16.5% (n=28) of participants were found with high dental anxiety. Previous studies also had similar results with a range from 11.2% to 15.48% of dentally anxious patients.[8,10] A mean MDAS score of 13.08±4.73 was found.

Pearson correlation coefficient between MDAS and GOHAI scores suggested r value of -0.129, which indicates a poor negative correlation between MDAS and GOHAI scores. This suggested that patient's OHRQoL decreases with increase in dental anxiety. Bivariate analysis between DA and OHRQoL identified a significant association at p = 0.0109. The analysis compared high anxiety according to MDAS with reduced oral health related quality of life as expressed by a GOHAI value that was at or above the median. As such, present study differentiates between better and worse without making a quality judgment. An odds ratio of 3.77 showed that subjects with high dental anxiety were more likely to be among the patient group with a reduced OHRQoL. The odds ratio of 3.77 also suggested that highly anxious patients were 3.77 times more likely to suffer from poor quality of life compared with less anxious ones.

This matches with McGrath *et al*[6] and Gisler et al[8] who reported that there could be a number of reasons why dental anxiety and poor oral health related quality of life coexist in the same population. One reason is that both DA and perceived poor OHRQoL reflect psychological characteristics of the group and thus their related negative attitude. Both OHRQoL and DA are reported to be associated with psychological states.[6]Another reason could be that dentally anxious people neglect their oral health to such an extent that they probably have high levels of

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untreated diseases.

This study did not examine any possible causes for the anxiety or the variety of different treatments and other factors that may influence anxiety, implying the need for further considerations on the causes of anxiety and its effect on oral health related quality of life. This could be the limitation of the present study. Taken together, the results of this study suggest that dental anxiety has some important consequences with respect to older adults, even though it appears to be less prevalent than in younger populations. Thus, that dental anxiety problem should be addressed among them to improve their overall oral heath related quality of life.

V. CONCLUSION

Within the limitation of this cross-sectional study of geriatric patients seeking dental treatment at a dental college in Vadodara city found that increased dental anxiety was associated with an impaired oral health related quality of life.

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