



## Original Research Article

## Evaluation of edentulism in elderly and its association with depression- A survey

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## ABSTRACT

**Introduction:** Edentulism is loss of all natural teeth. Depression increases the risk of poor oral health especially in elderly population with edentulism. This study was done to evaluate edentulism in elderly subjects and its association with depression.

**Materials and Methods:** This prospective study included 530 completely edentulous patients. Personal Health Questionnaire-8 (PHQ-8) was administered to all patients to assess the depression level. Parameters such as marital status, education, socio- economic status were also recorded.

**Results:** Out of 530 patients, males were 270 and females were 260. 265 patients had education up to primary standard, 150 had high and 115 had secondary standard, 270 had low socio- economic status, 180 had middle and 80 had high socio- economic status, 518 were married and 12 were unmarried. The difference was statistically significant ( $P < 0.05$ ). Patient health questionnaire (PHQ-8) scoring and interpretation with BRFSS response conversion, most of the patients (59.8%) had score more than 15 suggestive of depression symptoms. Edentulism was significantly associated with education level (OR 1.02, 95% CI=1.02–1.18), socio- economic status (OR 1.12, 95% CI= 0.92–2.04), marital status (OR 1.17, 95% CI=1.20–2.38) and depression (OR 1.52, 95% CI=1.26–2.06).

**Conclusion:** Authors found that edentulism was more prevalent among patients with poor socio- economic status, married and patients with education level upto primary level. Most of the patients had depression symptoms, thus suggesting association of depression with tooth loss.

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## 1. Introduction

Edentulism is loss of all natural teeth. It is most prevalent condition in elderly. It has been found to be present in 10% of population aged >50 years.<sup>1</sup> It is also seen in socially deprived young adults. Oral health affects overall health. As there is increase in life expectancy in last several years, the number of edentulous patient raises exponentially.<sup>2</sup>

It has been seen that poor oral health may be the risk factors for coronary artery disease, cerebro-vascular

accidents (CVA) and myocardial infarction.<sup>3</sup> Factors such as socio- economic status, education level, employment status, physical health, mental health and availability of dental care etc. play an important role in causing loss of teeth.<sup>4</sup> There is association between poor oral health and poor mental health, low self esteem and poor quality of life. Edentulism has also been found to be more prevalent in medically compromised elderly population. Edentulism directly affects facial appearance, nutrition, eating capacity, speaking and social life.<sup>5</sup>

Depression is quite common among age people and there has been rise in cases over last couple of years. It has

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harmful effect on the oral health. Depression increases the risk of poor oral health especially in elderly population.<sup>6</sup> Subjects with psychiatric illness or depression are more prevalent to edentulism. Such subjects are reluctant to their oral health resulting in edentulism. They are on multiple drugs for the psychiatric illness or depression.<sup>7</sup> This study aimed to evaluate edentulism in elderly subjects and its association with depression.

## 2. Materials and Method

This prospective study comprised of 530 completely edentulous patients visiting the department of Prosthodontic, Bridge & Crown work for the replacement of teeth. We commenced the study after getting approval from institutional ethics committee. The purpose of the study was explained to all patients and written consent was taken in their vernacular language.

The selection of patients was simple random technique. In all subjects, age, gender, socio-economic status, education level and marital status was recorded. A thorough oral examination was performed. Personal Health Questionnaire-8 (PHQ-8)<sup>8</sup> was administered to all patients to assess the depression level. It comprised of 9 questionnaire on which the Diagnostic and Statistical Manual of Mental Disorders 4th Edition Revised Text (DSM-IV-TR) diagnosis of depressive disorders is based. We used first 8 questionnaire and we recorded the number of days patient experienced depressive symptoms in last 2 weeks. It was interpreted as 0 to 1 day = not at all, 2 to 6 days = several days, 7 to 11 days = more than half the days, and 12 to 14 days = nearly each day, with position (0 to 3) allocated to both category, respectively. Based on the total score achieved by the patients on applying Personal Health Questionnaire-8 was aggregated. Patients with score that ranged from 0-4 was labeled with no significant depressive symptoms, score between 5-9 was labeled as mild depressive symptoms, score between 10-14 represented moderate depressive symptoms, 15-19 as moderately severe and 20-24 showed severe depressive symptoms. The data was compiled and statistical analysis (SPSS (IBM, Chicago, Illinois) version 19.0) was performed. Two logistic regression models were performed at significance was level of  $P < 0.05$ .

## 3. Results

Table 1 Shows that out of 530 patients, males were 270 and females were 260. 265 patients had education up to primary standard, 150 had high and 115 had secondary standard, 270 had low socio-economic status, 180 had middle and 80 had high socio-economic status, 518 were married and 12 were unmarried. The difference was statistically significant ( $P < 0.05$ ). Table 2 shows patient health questionnaire (PHQ-8) scoring and interpretation with BRFSS response

conversion, most of the patients (59.8%) had score more than 15 suggestive of depression symptoms. Table 3 shows that edentulism was significantly associated with education level (OR 1.02, 95% CI=1.02–1.18), socio-economic status (OR 1.12, 95% CI= 0.92–2.04), marital status (OR 1.17, 95% CI=1.20–2.38) and depression (OR 1.52, 95% CI=1.26–2.06).

**Table 1:** Distribution of patients based on gender

Gender	Number
Male	270 (50.9%)
Female	260 (49.1%)
<b>Education</b>	
Primary	265 (50%)
High	150 (28.3%)
Secondary	115 (21.7%)
<b>Socio-economic status</b>	
Low	270 (50.9%)
Middle	180 (33.9%)
High	80 (15.1%)
<b>Marital status</b>	
Married	518 (97.7%)
Unmarried	12 (2.3%)

## 4. Discussion

With the increase in life expectancy, there have been rise in cases of edentulism. Elderly people tend to lose teeth more frequently than young one.<sup>9</sup> Several factors such as socio-economic status, marital status, psychiatric illness etc. play an important role.<sup>10,11</sup> This study aimed to evaluate edentulism in elderly subjects and its association with depression.

In this study, we included 530 completely edentulous patients which comprised of 270 males and 260 females. 265 (50%) patients had education up to primary standard, 150 (28.3%) had high and 115 (21.7%) had secondary standard, 270 (50.9%) had low socio-economic status, 180 (33.9%) had middle and 80 (15.1%) had high socio-economic status, 518 (97.7%) were married and 12 (2.3%) were unmarried.

Saman et al conducted a study to assess role of depression and rural residency in edentulism and found that depression and rural residency were the important factors related to partial and full edentulism following controlling for possible confounders.<sup>12</sup>

We found that most of the patients (59.8%) had scored more than 15 suggestive of depression symptoms. Okoro et al in their survey found that 56.1% population had tooth loss. They found patients with depression had a significantly higher prevalence of nonuse of oral health services in the last few years than those without this disorder ( $P < 0.001$ ). It was observed that adults with depression and anxiety were more likely to have tooth loss. Adults with existing depression, lifetime diagnosed depression and

**Table 2:** Patient health questionnaire (PHQ-8) scoring and interpretation with BRFSS response conversion

Questionnaire	0-1 day	2-6 days	7-11 days	12-14 days
	Not at all	Several days	More than half days	Nearly everyday
1. Limited interest in doing work	15%	20%	40%	25%
2. Subjects with feeling of depression, hopelessness	20%	35%	15%	30%
3. Difficulty in sleeping or long sleep	40%	13%	25%	22%
4. Tiredness	20%	17%	35%	28%
5. Anorexia or excessive eating	14%	15%	37%	34%
6. Self bad feeling	10%	10%	30%	50%
7. Difficulty in concentration in work	30%	15%	15%	40%
8. Speaking or moving so slowly	23%	20%	25%	32%

**Table 3:** Bivariate analysis of patients

	Unadjusted odds ratio (95% CI)	P value
<b>Gender</b>		
Male	1.12	
Female	1.20	0.91
<b>Education</b>		
Primary	1.10	
High	1.02	0.042
Secondary	1.78	
<b>Socio- economic status</b>		
Low	1.57	
Middle	1.13	0.021
High	1.02	
<b>Marital status</b>		
Married	2.31	0.001
Unmarried	1.16	
<b>PHQ-8 Score (Depression)</b>	1.52	0.021

lifetime established anxiety were significantly more likely to have had at least one tooth removed than those without each of these disorders ( $P < 0.001$  for all), after fully regulated for estimated confounders.<sup>13</sup>

We found that edentulism was significantly associated with education level (OR 1.02, 95% CI=1.02–1.18), socio-economic status (OR 1.12, 95% CI= 0.92–2.04), marital status (OR 1.17, 95% CI=1.20–2.38) and depression (OR 1.52, 95% CI=1.26–2.06). Latif et al<sup>14</sup> in their study on 5392 patients, 100 subjects were recruited. It was found that smoking prevalence was 73%, hypertension, diabetes, and HIV+ prevalence were 26%, 13%, and 5%, respectively. 41% found to be with history of depression/psychiatric illness. 55% were taking three or more medications, 32.8% were taking five or more, and 22.4% were on seven or more. Author found an association between depression and edentulism.

Tyrovolas et al<sup>15</sup> assessed the incidence of edentulism and its association with depression and self-rated health. Edentulism was considerably correlated with depression

(OR 1.57, 95% CI=1.23–2.00) and deprived self-rated health (OR 1.38, 95% CI=1.03–1.83) in the younger group with no considerable associations in the older age group.

Psychiatric illness such as depression is quite common among elderly. Assessment of depression symptoms and appropriate management of such symptoms may be helpful in reducing the cases of tooth loss. A large scale survey emphasizing the evaluation of depression among elderly is required.

The drawback of this study is smaller sample range. Other factors such as smoking, alcoholism medical illnesses etc. which has harmful deleterious effect on body as well as on oral cavity were not taken under consideration. The inclusion of all such parameters could have been useful in achieving better results.

## 5. Conclusion

Authors found that edentulism was more prevalent among patients with poor socio- economic status, married and

patients with education level up to primary level. Depression has deleterious effect in patients. The majority of the patients had depression indication, thus imply the connection of depression with tooth loss.

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## 8. Conflict of Interest

None.

## References

- Nordenram G, Davidson T, Gynther G, Helgesson G, Hultin M, Jemt T. Qualitative studies of patients' perceptions of loss of teeth, the edentulous state and prosthetic rehabilitation: A systematic review with meta-synthesis. *Acta Odontol Scand.* 2015;71:937–51.
- Nagaraj E, Mankani N, Madalli P, Astekar D. Socioeconomic factors and complete edentulism in north karnataka population. *J Indian Prosthodont Soc.* 2014;14:24–8.
- Mai X, Wactawski-Wende J, Hovey KM, LaMonte MJ, Chen C, Tezal M, et al. Associations between smoking and tooth loss according to the reason for tooth loss. *J Am Dent Assoc.* 2013;144(3):252–65.
- Khazaei S, Keshтели AH, Feizi A, Savabi O, Adibi P. Epidemiology and Risk Factors of Tooth Loss among Iranian Adults: Findings from a Large Community-Based Study. *Bio Med Res Int.* 2013;2013:1–8.
- Hamano T, Takeda M, Tominaga K, Sundquist K, Nabika T. Is Accessibility to Dental Care Facilities in Rural Areas Associated with Number of Teeth in Elderly Residents? *Int J Environ Res Public Health.* 2017;14(3):327.
- Bachkati KH, Mortensen EL, Brønnum-Hansen H, Holm-Pedersen P. Midlife Cognitive Ability, Education, and Tooth Loss in Older Danes. *J Am Geriatrics Soc.* 2017;65(1):194–9.
- Kisely S, Sawyer E, Siskind D, Lalloo R. The oral health of people with anxiety and depressive disorders – a systematic review and meta-analysis. *J Affect Disord.* 2016;200:119–32.
- Kroenke K, Strine TW, Spitzer RL, Williams JBW, Berry JT, Mokdad AH, et al. The PHQ-8 as a measure of current depression in the general population. *J Affect Disord.* 2009;114(1-3):163–73.
- Rodrigues SM, Oliveira AC, Vargas AMD, Moreira AN, Ferreira EF. Implications of Edentulism on Quality of Life among Elderly. *Int J Environ Res Public Health.* 2012;9(1):100–9.
- Quine S, Morrell S. Hopelessness, depression and oral health concerns reported by community dwelling older Australians. *Community Dent Health.* 2009;26:177–82.
- Khajuria R, Sudan S, Sharma S, Sudan T. To assess the relation between depression and tooth loss- A questionnaire survey. *J Appl Dent Med Sci.* 2018;4:1.
- Saman DM, Lemieux A, Arevalo O, Lutfiyya MN. A population-based study of edentulism in the US: does depression and rural residency matter after controlling for potential confounders? *BMC Public Health.* 2014;14(1):65.
- Okoro CA, Strine TW, Eke PI, Dhingra SS, Balluz LS. The association between depression and anxiety and use of oral health services and tooth loss. *Community Dent Oral Epidemiol.* 2012;40(2):134–44.
- Latif TM, Vieira AR. Risk factors and comorbidities associated with complete edentulism in individuals younger than fifty years of age. *J Dent Oral Health.* 2017;4:1–6.
- Tyrovolas S, Koyanagi A, Panagiotakos DB, Haro JM, Kassebaum NJ, Chrepa V, et al. Population prevalence of edentulism and its association with depression and self-rated health. *Scientific Rep.* 2016;6(1):37083.

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