

Prevalence and correlates of anxiety among patients with dental disease on follow up at St. Paul Hospital Millennium Medical College, Addis Ababa, Ethiopia.

Kemal Jemal, MSc, * Worku Bedada, PhD

¹Department of Nurse, College of Health Science, Salale University, Fiche, Oromiya, Ethiopia

*Corresponding author: Kemal Jemal

P.O. Box 245, Tel.:+251- 9-13-30-87-02, olifanjemal@gmail.com

Abstract: Background: anxiety one of the most widespread mental disorders that is also common among people with dental diseases. However, association between anxiety and dental diseases is poorly studied in Ethiopia. This study was thus initiated to determine the prevalence of anxiety and associated factors in people with dental disease at St. Paul Hospital Millennium Medical College (SPHMMC). Methods: Institution based cross-sectional study was conducted at SPHMMC from May 1-31, 2016. Data were collected using a pretested, semi-structured, standardized and culturally validated version of Hospital anxiety and depression scale (HADS-A). Systematic sampling technique was used to select the study participants. Binary logistic regression analysis was used to identify associated factors. Odds ratio with 95% CI was computed to assess the strength of associations. Results: A total of 423 participants were studied, with response rate of 100%. The prevalence of anxiety was found to be 30.3%. In the multivariable analysis, being female [AOR=1.93, 95% CI (1.02, 3.66)], age groups of 30-44 [AOR= 2.77, 95% CI (1.38, 5.58)], tooth loss [AOR=2.18, 95% CI (1.28, 3.70)], irregular tooth brushing [AOR=2.12, 95% CI (1.17, 3.84)] and having another chronic disease [AOR=2.54, 95% CI (1.13, 5.74)] were significantly associated with anxiety among people with dental disease. Conclusions: The prevalence of anxiety was high among people with dental disease. Sex, age, tooth loss, tooth brushing practice and co-morbid are risk factors. It is therefore important to consider these factors for successful management of anxiety in people with dental diseases.

[Kemal Jemal, Worku Bedada. **Prevalence and correlates of anxiety among patients with dental disease on follow up at St. Paul Hospital Millennium Medical College, Addis Ababa, Ethiopia.** *Biomedicine and Nursing* 2017;3(3): 56-62]. ISSN 2379-8211 (print); ISSN 2379-8203 (online). <http://www.nbmedicine.org>. 6. doi:[10.7537/marsbnj030317.06](https://doi.org/10.7537/marsbnj030317.06).

Key words: Prevalence, Anxiety, People with Dental Disease, Risk factors, Ethiopia

Background

Dental disease is one of the chronic diseases affecting all age groups across the globe and poses an economic burden to health care services. Around 5 billion peoples globally are exposed to tooth decay and greater than 90% of caries are left untreated (1,2,3). Study conducted in Ethiopia revealed that the prevalence of oral hygiene practice is 57% (4).

Dental disease has a profound effect on general health, social interaction and quality of life. (5, 6). Around three fourth (73%) of patients with dental disease had psychiatric co-morbidity and 14% of them had mixed anxiety and depressive disorders (7,10). Particularly, anxiety is the major common psychological disorders occurring among dental patients. The National Comorbidity Study reported that one out of four persons met the diagnostic Criteria for at least one anxiety disorder and that there is a 12-month prevalence rate of 17.7% in the world(8,11-16).

Anxiety among people with dental disease have been associated with physiological reactions, psychological state, and daily living activities, poor oral hygiene which can increase the chain of agents that may cause severe dental disease (17-20). It is clear that active case finding and management of

anxiety can improve management of dental pain and outcome and also minimize complications(21-23). Study done in Jimma university, Ethiopia indicated that the prevalence of anxiety among university students was 41% (9). However, anxiety associated with dental disease and related factors are least investigated in Ethiopia. This study was initiated to fill these gaps.

Methods

Study Setting and Design: Institutional based cross-sectional study was conducted at SPHMMC from May 1-31, 2016, Addis Ababa, Ethiopia.

Study population: The study population consisted of all adults with dental disease who had follow-up during the four weeks data collection period. Those adult who were critically ill were excluded from the study.

Sampling procedure: Sample size was determined based on single population proportion formula using Epi-info version 7 with a 95% CI, 5% margin of error and taking prevalence of Anxiety 50%. Assuming a 10 % non-response rate a total sample size of 423 persons with dental disease required. Systematic sampling technique was used to select the

study participants. Sampling interval was determined by dividing the total study population to total sample size. The starting point was randomly selected.

Data collection: Data were collected by trained psychiatry nurses through face to face interview using pre-tested questionnaire. Clinical and substance related data were collected using semi-structured questionnaires. Social support was collected by Oslo 3-item social support scale, the sum score scale ranges from 3-14 and has three broad categories: “poor support” 3-8, “moderate support” 9-11 and “strong support” 12-14 (24, 30). It has been proved reliable in pretest (Cronbach's $\alpha = 0.57$). Anxiety was measured using seven items of anxiety (anxiety sub Scale) of Hospital Anxiety and Depression Scale (HADS) with cut-off points of greater than or equal to 8 scores. It was validated in Ethiopia and internal consistency was 0.78 for anxiety. The scales use a cut off score for anxiety of greater than or equal to 8 (25).

Data Process and Analyses: Data were analyzed using SPSS version 21. Description of means, frequencies, proportions and rates of the given data for each variable was calculated. Bivariate analysis was used to see the association of each independent variable with the outcome variable. Those variables having p-value less than 0.2 were entered into the multivariate logistic regression model to identify the effect of each independent variable with the outcome variables. A p-value of less than 0.05 was considered statistically significant, and adjusted odds ratio with 95% CI was calculated to determine association.

Ethical Consideration: Ethical clearance was obtained from the Institutional Review Board of the University of Gondar and Amanuel Specialized Mental Hospital. A formal letter of request for permission was submitted to SPHMMC permission was granted. Written informed consent was obtained from each study participant before data collection. Information regarding participants' identity was kept confidential.

Results

Socio-demographic characteristics

A total of 423 participants were included in the study which makes the response rate 100%. The mean age of the respondents was 34.78(\pm standard deviation=12.86) years and 170(40.2 %) were in the age ranges of 30-44 years. Among total participants, about two-third of them, 275(65%) were females and 238(56.3%) were married. Regarding education status, about one-third of the study participants, 142 (33.6%) attended primary education. Majority of the participants, 306(72.3%) were Orthodox Christians and 35.5% were Oromo by ethnicity. The average monthly income of the participants was 800 Ethiopian birr (**Table 1**).

Clinical and psychosocial characteristics

One hundred eighty six (44.0 %) patients were diagnosed with tooth decay, 252 (59.6%) were in new dental disease category, 248 (58.6%) had less than 6 months duration of illness, and 190 (44.9%) had poor social support. Irregular tooth brushing practice and oral bad odor accounted for 69.7% (295) and 27.7% (117), respectively. From the study participants, 63 (14.9%) had co-morbid chronic diseases (hypertension, renal diseases, cardiovascular diseases & diabetes) and 85 (20.1%) were alcohol users (**Table 2**).

Prevalence of anxiety

The prevalence of anxiety among patients with dental disease was 30.3% (128), with 95% confidence interval of (25.8-35).

Factors associated with anxiety

Multivariable logistic analysis showed that the model adequately fitted with the data for anxiety as p-value from Hosmer and Lemeshow test was 0.691. During multivariable analysis; sex, age groups (30-44), tooth loss, irregular tooth brushing and having chronic disease were significantly associated with anxiety. According to the result of this study, being female was about 1.93 times [AOR=1.93, 95% CI (1.02, 3.66)] more likely to have anxiety when compared to male. The odds of developing anxiety disorders among age groups of 30-44 were 2.77 times [AOR= 2.77, 95% CI (1.38, 5.58)] more likely as compared to age groups of >45. The odds of having anxiety disorder among study subjects with tooth loss was 2.18 times [AOR=2.18, 95% CI (1.28, 3.70)] higher when compared with individual who have tooth decay. Those who have irregular brushing of their tooth was also 2.12 times [AOR=2.12, 95% CI (1.17, 3.84)] more likely to have anxiety as compared to those who have regular tooth brushing. Having chronic diseases were 2.54 times [AOR=2.54, 95% CI (1.13, 5.74)] higher to have anxiety as compared to those who have no chronic disease (**Table 3**).

Discussion

This study assessed the prevalence of anxiety and associated factors among people with dental disease at SPHMMC. The study revealed that the prevalence of anxiety was 30.3%. It is higher than those reported in Nigeria 8.12%(26), tertiary care hospital in Pakistan 22.5% (27) and India 20.86% (15). On the other hand, our finding is lower than studies result reported with patients attending institute of dentistry in Pakistan 36.8%(16), 39.5% (28) and Sweden 84%(14). These variations are due to variations in study set-up and design, sample size, data collection tools and co-morbid conditions (14,15,16, 26,27,28). Such discrepancy was even observed in the same country but different study setups (16, 27).

The current study has also assessed factors associated with anxiety among patients with dental diseases. Being female, age group of 30-44, tooth loss, irregular tooth brushing and having chronic disease were significantly associated with anxiety. According to our study, being female was more likely to develop anxiety than being male. This finding was similar with the study reported in Nigeria and Australia where females were reported to be more anxious than males(29, 30). Moreover, women reported higher fear in relation to specific stimuli, such as fear of the needle and fear of the drill, than males(31). Furthermore, females explain their feelings completely(32).

In our study, anxiety disorder was more observed in middle aged clients, which is in line with the study reported in Australia where significant associations were observed with age group 30–44(33). This might be attributed to hormonal differences and differential exposures to social and cultural events, which differently affect cognitive and emotional stages and in turn anxiety level (34). Individuals who had tooth loss were two times more likely to develop anxiety compared to those with tooth decay based on our findings. This finding was in line with study reported in USA, which indicated that patients with tooth loss was three times more likely to develop anxiety (35). This was not unexpected since tooth loss causes a decreased ability to chew and speak, and consequently cause poor nutrition and potential harm to general and oral health. It has social, psychological and cultural implication due to its significance in both verbal and nonverbal communication (36, 37). All these increase the magnitude of anxiety.

Additionally, the current study found that irregular tooth brushing practice was related to more anxiety. This finding is comparable with the study reported in Finland, where anxiety was significantly associated with lower frequency of tooth brushing and negligence of doing it regularly(13). Lower frequency and irregular oral care practice can lead to tooth decay and loss resulting in poor oral outcome and in turn to anxiety.

Finally, chronic diseases were also found to magnify anxiety. People with dental disease having chronic diseases were more likely to develop anxiety than those with no similar cases. Chronic diseases such as oral cancer, diabetes and cardiovascular disorders increase the risk of anxiety in people with dental disease. Previous study also indicated that chronic co-morbid conditions in people with dental diseases can aggravate mental illnesses and also affect treatment outcomes(38).

Conclusion

The prevalence of anxiety among people with dental diseases is about 30% in the current study. Being female, being in the age group of 30-44, tooth loss, irregular tooth brushing and having chronic disease were significantly associated with anxiety. It is thus very crucial to consider these factors for successful management of anxiety in people with dental diseases.

Table 1: Socio-demographic variables among people with dental disease in outpatient department of SPHMMC Addis Ababa, 2016 (n=423)

Variables	Frequency	Percentage (%)
Age group		
18-29	165	39.0
30-44	170	40.2
>45	88	20.8
Sex		
Female	275	65
Male	148	35
Religion		
Orthodox	306	72.3
Muslim	62	14.7
Protestant	50	11.8
Others*	5	1.2
Marital status		
Married	238	56.3
Single	140	33.1
Divorced	28	6.6
Widowed	17	4.0
Ethnicity		
Oromo	150	35.5
Amhara	134	31.7
Gurage	62	14.6
Tigre	36	8.5
Silte	41	9.7
Educational status		
Not formally educated	108	25.5
Primary school	142	33.6
Secondary school	62	14.7
College /university	111	26.2
Occupational status		
Government employed	152	35.9
Private business	86	20.3
Farmer	65	15.4
Student	22	5.2
House wife	74	17.5
Jobless	24	5.7
Monthly Income		
< 735 ETB	192	45.4
735 – 1176 ETB	71	16.8
> 1176 ETB	160	37.8

*Catholic, Adventist

Table 2:- Clinical and Psychosocial factors among people with dental disease in outpatient department of SPHMMC Addis Ababa 2016 (n=423)

Variables	Frequency	Percentage (%)
Type of dental problem		
Tooth decayed	186	44
Tooth extraction	114	27
Toot loss	92	21.7
Trauma or accident of tooth	31	7.3
Duration of illness		
>6 month	175	41.4
<6 month	248	58.6
History of Visits dentist		
Repeat	171	40.4
New	252	59.6
Tooth brushing		
Regular tooth brush	128	30.3
Irregular tooth brush	295	69.7
Have Chronic disease		
Yes	63	14.9
No	360	85.1
Social support		
Strong social support	82	19.4
Intermediate social support	151	35.7
Poor social support	190	44.9
Oral bad odor		
Yes	117	27.7
No	306	72.3

Limitations

Validation study was not done for the Oslo 3-item social support scale in Ethiopia. Besides, the study was cross-sectional and thus causality and temporality cannot be established or inferred. There may also be bidirectional relationship between anxiety and oral health. Lastly, the impact of substance abuse on anxiety must be substantiated scientifically.

Acknowledgements

The authors acknowledge Amanuel mental specialized hospital for funding this study, and SPHMMC and study participants for their cooperation.

Competing interests

The authors declare that they have no competing interests.

Authors' contributions

KJ conceived the study and was involved in all processes thereafter. WB involved in the analysis and write up of the manuscript.

Table 3: Bivariate and multivariable logistic analysis of associated factors with anxiety among people with dental disease in outpatient department of SPHMMC Addis Ababa 2016 (n=423)

Explanatory Variables	Anxiety		Crud OR (95% CI)	Adjusted OR (95% CI)
	Yes	No		
Sex				
Male	26	122	1.00	1.00
Female	102	173	2.77(1.70,4.51)	1.93(1.02,3.66)*
Age groups				
18-29	36	129	1.09(0.57,2.05)	1.06(0.49,2.31)
30-44	74	96	3.00(1.65,5.46)	2.77(1.38,5.58)**
>45	18	70	1.00	1.00
Educational status				
Not formally educated	58	50	4.21(2.33,7.58)	1.37(0.59,3.18)
Primary school	31	111	1.01(0.55,1.85)	1.01(0.49,2.10)
Secondary school	15	47	1.16(0.55,2.42)	1.52(0.63,3.70)
College /university	24	87	1.00	1.00
Occupational status				
Government employed	51	101	1.00	1.00
Private business	19	67	0.56(0.31,1.03)	0.56(0.27,1.15)
Farmer	22	43	1.01(0.55,1.87)	0.81(0.35,1.86)
Student	5	17	0.58(0.20,1.67)	0.86(0.24,3.05)
House wife	22	52	0.84(0.46,1.53)	0.54(0.25,1.17)
Jobless	9	15	1.19(0.49,2.90)	1.25(0.38,4.03)
Social support				
Poor	88	102	2.68(1.50,4.77)	1.66(0.84,3.30)
Intermediate	20	131	0.47(0.24,0.94)	0.50(0.24,1.07)
Strong	20	62	1.00	1.00
Type of dental problem				
Toot loss	85	152	1.86(1.21,2.87)	2.18(1.28,3.70)**
Tooth decayed	43	143	1.00	1.00
Duration of illness				
<6 month	67	181	1.00	1.00
>6 month	61	114	1.45(0.95,2.20)	1.52(0.92,2.51)
Tooth brushing				
Regular tooth brushing	22	106	1.00	1.00
Irregular tooth brushing	106	189	2.70(1.61,4.53)	2.12(1.17,3.84)*
Having chronic disease				
Yes	42	21	6.37(3.58,11.35)	2.54(1.13,5.74)*
No	86	274	1.00	1.00
Hx of dental visiting				
Repeat	47	124	0.80(0.52,1.23)	1.16(0.67,1.99)
New	81	171	1.00	1.00
Alcohol use				
Yes	45	40	3.46(2.11,5.66)	1.39(0.65,2.97)
No	83	255	1.00	1.00
Khat use				
Yes	28	27	2.78(1.56,4.95)	1.63(0.70,3.79)
No	100	268	1.00	1.00
Tobacco use				
Yes	29	28	2.79(1.58,4.93)	1.05(0.43,2.57)
No	99	267	1.00	1.00

* Significant association (p-value < 0.05); **Significant association (p-value < 0.01);

***Significant association (p-value < 0.0001); Hosmer and Lemeshow test = 0.691

Chronic diseases: Hypertension, Renal diseases, cardiovascular diseases & Diabetes

References

1. Widström E, Eaton K, Vanobbergen J. Oral healthcare systems in the Extended European Union, partim: [Oral Health care system in] Belgium. *Oral health & preventive dentistry*. 2004;2(3):155.
2. Moynihan P, Petersen PE. Diet, nutrition and the prevention of dental diseases. *Public health nutrition*. 2004;7(1a):201-26.
3. Petersen PE. The World Oral Health Report 2003: continuous improvement of oral health in the 21st century—the approach of the WHO Global Oral Health Programme. *Community Dentistry and oral epidemiology*. 2003;31(s1):3-24.
4. Senait M. Determinant Factors of dental Caries in Ethiopian military personnel: AAU, 2005; 2016.
5. Ogawa H, Petersen PE, Bourgeois D, Ndiyae C, Estupinan-Day S. The global burden of oral diseases and risks to oral health, 2005.
6. Petersen PE. Priorities for research for oral health in the 21st Century—the approach of the WHO Global Oral Health Programme. *Community Dental Health*. 2005;22(2):71-4.
7. Nesse RM. Fear and fitness: An evolutionary analysis of anxiety disorders. *Ethology and sociobiology*. 1994;15(5):247-61.
8. McLean CP, Asnaani A, Litz BT, Hofmann SG. Gender differences in anxiety disorders: prevalence, course of illness, comorbidity and burden of illness. *Journal of psychiatric research*. 2011;45(8):1027-35.
9. Ayele M, Mengistu A. Psychosocial Problems of Jimma University Students, South West Ethiopia. *Ethiopian Journal of Health Sciences*. 2004;14(1):43-9.
10. Ray PK, Ray S, Makhal M, Majumder U, De S, Ghosh S. Prevalence of psychiatric co-morbidity among patients attending dental OPD and the role of consultation-liaison psychiatry in dental practice in a tertiary care general hospital. *Indian Journal of Dentistry*. 2015;6(1):32.
11. Wiener RC, Wiener MA, McNeil DW. Comorbid depression/anxiety and teeth removed: Behavioral Risk Factor Surveillance System 2010. *Community Dentistry and oral epidemiology*. 2015;43(5):433-43.
12. Pekkan G, Kilicoglu A, Hatipoglu H. Relationship between dental anxiety, general anxiety level and depression in patients attending a university hospital dental clinic in Turkey. *Community Dental Health*. 2011;28(2):149.
13. Anttila S, Knuuttila M, Ylöstalo P, Joukamaa M. Symptoms of depression and anxiety in relation to dental health behavior and self - perceived dental treatment need. *European journal of oral sciences*, 2006;114(2):109-14.
14. Bohman W. Psychosocial and dental factors in the maintenance of severe dental fear. *Swedish dental journal*, 2010;34(3):121.
15. Suresh KV, Shenai P, Chatra L, Ronad Y-AA, Bilahari N, Pramod RC, et al. Oral mucosal diseases in anxiety and depression patients: Hospital based observational study from south India. *Journal of clinical and experimental dentistry*, 2015;7(1): e95.
16. Rashid H, Hussain SS. Prevalence of depression, anxiety and stress among orthodontics patients visiting a tertiary care hospital, pakistan. *International Journal of Dental Clinics*, 2014;6(1).
17. Jiang Y. Sociodemographic and health-related risk factors associated with tooth loss among adults in Rhode Island. *Preventing chronic disease*, 2013;10.
18. Cohen S, Fiske J, Newton J. Behavioural dentistry: The impact of dental anxiety on daily living. *British Dental Journal*, 2000;189(7):385-90.
19. Rosania AE, Low KG, McCormick CM, Rosania DA. Stress, depression, cortisol, and periodontal disease. *Journal of periodontology*, 2009;80(2):260-6.
20. Lieutenant Randy Reese M U,;. Depression and dental health.. Naval Postgraduate Dental School National Naval Dental Center Bethesda Maryland, 2003;25.
21. Armfield J, Heaton L. Management of fear and anxiety in the dental clinic: a review. *Australian Dental Journal*, 2013;58(4):390-407.
22. Hmud R, Walsh L. Dental anxiety: causes, complications and management approaches. *Journal of Minimum Intervention in Dentistry*, 2009;2(1):67-78.
23. Newton JT, Asimakopoulou K. Managing oral hygiene as a risk factor for periodontal disease: a systematic review of psychological approaches to behaviour change for improved plaque control in periodontal management. *Journal of clinical periodontology*. 2015;42(S16).
24. Abiola T, Udofia O, Zakari M. Psychometric properties of the 3-item Oslo Social Support scale among clinical students of Bayero University Kano, Nigeria. *Malaysian Journal of Psychiatry*, 2013;22(2):32-41.

25. Reda AA. Reliability and validity of the Ethiopian version of the hospital anxiety and depression scale (HADS) in HIV infected patients. *PLoS One*, 2011;6(1): e16049.
26. Egbor PE, Akpata O. An evaluation of the sociodemographic determinants of dental anxiety in patients scheduled for intra-alveolar extraction. *Libyan Journal of Medicine*, 2014;9(1).
27. Khan MA. Anxiety and Depression in Patients Attending Institute of Dentistry CMH Lahore. *Annals of Pakistani Institute of Medical Science* 2015;11(1):17-20.
28. Muna A, Ahmed R. Assessment of the prevalence of dental anxiety among Palestinian clients attending dental clinics in Bethlehem city: Cross sectional study. *Psychology and Behavioral Sciences*. 2014;3(6):197-202.
29. Udoye CI, Oginni AO, Oginni FO. Dental anxiety among patients undergoing various dental treatments in a Nigerian teaching hospital. *Journal of Contemporary Dental Practice* 2005;6(2):91-8.
30. Akhigbe KO, Koleoso ON. Trait anxiety, sex, age and dental treatment experience as determinants of dental anxiety among chronic dental patients in Nigeria. *European Scientific Journal*, 2014;10(12).
31. Holtzman JM, Berg RG, Mann J, Berkey DB. The relationship of age and gender to fear and anxiety in response to dental care. *Special care in dentistry*,1997;17(3):82-7.
32. Peretz B, Rosenblum A, Zadik D. Stress levels and related variables among dental students in Jerusalem, Israel. *European Journal of Dental Education*,1997;1(4):162-6.
33. Armfield JM, Slade GD, Spencer AJ. Dental fear and adult oral health in Australia. *Community Dentistry and oral epidemiology*,2009;37(3):220-30.
34. Armfield JM, Spencer A, Stewart JF. Dental fear in Australia: who's afraid of the dentist? *Australian Dental Journal*,2006;51(1):78-85.
35. 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 Dentistry and oral epidemiology*, 2012;40(2):134-44.
36. Scully C. Oral health in America: a report of the Surgeon General, 2000.
37. Joshipura K, Ritchie C, Douglass C. Strength of evidence linking oral conditions and systemic disease. *Compendium of continuing education in dentistry (Jamesburg, NJ: 1995) Supplement*, 1999(30):12-23; quiz 65.
38. Health UDo, Services H. Public Health Service, Office of the Surgeon General Mental health: A report of the Surgeon General, 1999.

8/28/2017