

The impact of depression status on dental caries severity among internally displaced people in Baghdad/Iraq

Sama Mowafaq Mohammed, B.D.S. ⁽¹⁾

Ban Sahib Diab B.D.S, M.Sc., Ph.D. ⁽²⁾

ABSTRACT

Background: changing in lifestyle like displacing place could cause depression which is a common mental disorder that change general health that affect dental caries incidence and severity. The aims of this study were to assess the relation of depression status on prevalence and severity of dental caries among internally displaced people.

Material and Method: The sample include 121 internally displaced people aged from 13-17 years. Method for depression measuring is by using Children Depression Inventory (CDI₂) questionnaire. Dental caries is measured by using caries experience (DMFs) and caries severity D₁₋₄.

Result: the mean value for decayed and missing surfaces were higher in high depression grade as comparing with low and medium depression grade, while filled surfaces were with higher mean value in low grade than high grade of depression and absent in medium grade. While when measuring caries severity (D₁₋₄), the highest mean value for D₁, D₃ were in medium depressed group while D₂, D₄ were with highest value in high depressed group.

Conclusion: depression among internally displaced people had an effect on caries severity.

Key word: Depression, Internally displaced people, dental caries experience and severity. (Received: 15/9/2018; Accepted: 5/11/2018)

INTRODUCTION

Depression is a significant contributor to the global burden of disease and affects people in all communities through the world ⁽¹⁾. Depressive episode: can be expressed by many symptoms like depressed mood, loss of both interest and enjoyment with increasing in fatigability ⁽²⁾, while Recurrent depressive disorder: is categorized by repeated period of depression without and previous history of free episodes of elevation in the mood ⁽³⁾. Many physical diseased patients may undergo mortality due to depression ⁽⁴⁾. They found that the persons who undergo mental disorder like depression generally their general health is poor ⁽⁵⁾. So depressive symptom can be related to poor oral health. The factors that contribute to the occurrence of depression including genetics, biochemical and environmental ⁽⁶⁾.

Internally displaced persons (IDPs) are: "persons or groups of persons who have been forced or obliged to flee or to leave their homes or places of habitual residence ⁽⁷⁾, they live in low socioeconomic status that considered as risk factor for depression and poor oral health including dental caries which is one of the most infectious and communicable intractable human disease is the dental caries ^(8,9)

According to American Academy for pediatric the period of time in which dental caries is so active is through the adolescence ⁽¹⁰⁾ (The period of life that range from 11-19 years old) ⁽¹¹⁾.

It characterized by quick changes in body size, shape and composition is known as puberty. At the same time some of individual grow earlier and faster than the others ⁽¹²⁾

Many studies had attempted to evaluate the relationship between psychosocial factors and dental caries however, depressive symptom can be related to poor oral health. Depression has been associated with high dental caries ⁽¹³⁻¹⁵⁾

In Iraq, Al Salman in 2014 study the relation between depression and dental caries in 15 aged students in Al- Seweera city, in order to estimate the prevalence and severity of dental caries in relation to depression status, and found the caries experiences (DMFs) higher among high grade of depression than medium and, or low depression grade, the same result concerning caries severity, with significant result concerning D₄ ⁽¹⁶⁾

The aim of present study was to assess the relation of depression status on prevalence and severity of dental caries among internally displaced people as the hypothesis is that the internally displaced people suffering from depression that adversely affect their general health through which affect the oral health.

MATERIALS AND METHODS

The selected sample composed of all internally displaced people from three camped area in Baghdad city that involve 121 both males and females aged from 13-17 years. The participants were informed about the aim of the study and were freely allowed to accept the examination. Informed consent and approval had been obtained. The participants were selected and examined in the camped area in Baghdad city. By

(1) Master student, Department of Pedodontics and Preventive Dentistry, University of Baghdad

(2) Professor, Department of Pedodontics and Preventive Dentistry, College of Dentistry, University of Baghdad.

using children depression inventory (CDI₂) as measuring tool for depression ⁽¹⁷⁾, which divided participants into three groups according to the severity of condition (low, medium, high grade). The items of the scores were considered as Negative, Negative self-esteem, ineffectiveness, Interpersonal problem score. The total score will give the grades of depression according to graduated scale depending on age and gender ⁽¹⁷⁾. The questionnaire was translated to Arabic language and conformation of translation was obtained and prepared to be used in Iraq. At the same time the validity and reliability of index also measured.

Oral examinations were done under standardized conditions according to the basic methods of oral health surveys of World Health Organization 1997 ⁽¹⁸⁾. Dental caries of the participants was recorded according to Manji et al. in 1989, by using dental explorer. Caries experience was measured by using Sickie-shaped dental explorers and mirror to record the (permanent teeth) decayed lesion severity (D₁₋₄) ⁽¹⁹⁾, missing and filled surfaces (DMFs). By examination all the surfaces of tooth by beginning from mesial surface followed by occlusal, distal, buccal then lingual surface. Tooth was considered present in the oral cavity when any part of it was visible or can be touched by dental explorer without extremely displacing the soft tissue. If more than one grade of caries severity (D₁₋₄) present in the same surface, the most sever grade for caries severity was recorded, while temporary filling was listing as D₃.

According to DMFs, fraction F was recorded when one or more permanent filling or restoration was found and there was no another area on the tooth was affected by either primary or secondary caries. M- Fraction of DMFs was recorded for the teeth that extracted just for the reason of caries

that evaluated as five surface for posterior teeth and for surface for anterior teeth.

Statistical analysis: data description, analysis presentation were performed by using Statistical package for social sciences (SPSS).

Descriptive analysis: frequency, percentage used for nominal variables while mean, Standard error for numeric variable. Also by using One Way Analysis of Variance (ANOVA) for testing quantitative dependent variable by a single factor. Level of significance: not significant at $P > 0.05$, significant at $P \leq 0.05$, and highly significant at $P \leq 0.01$

RESULTS

The data of present study showed that 56.2% were with high depression grade and only 24.8% were with low depression grade

Concerning occurrence of dental caries table 2 illustrate that dental caries was found to be lower among low (79.7%) and medium depressed (78.3%) than high depressed (91.2%) group.

The caries experience according to depression grades by gender illustrate in table 3

The caries experience according to depression grades illustrate in table 3 that shows the differences of all grades of caries among different grade of depression were not significant, while for the DMFS was significant, further analysis used LSD test showed that the mean differences between low and medium grade was 3.12 with P value 0.01. while medium with high grade of depression $m = 2.73$, $P = 0.01$ as only these differences were significant. More-over, the result illustrated that the highest mean value for D₁, D₃ was among medium depression grade while D₂, D₄ was found for high depression grade as shown in table 4 as all differences were not significant.

Table 1: The distribution of sample according to depression grade

	Depression grade					
	Low		Medium		High	
	Num.	%	Num.	%	Num.	%
Sample	30	24.8	23	19	68	56.2

Table 2: The distribution of person with caries according to depression grade.

Caries status	Depression grades					
	Low		Medium		High	
	No.	%	No.	%	No.	%
Sample	29	79.7	18	78.3	62	91.2

Table 3: Caries experience DMFS and its components (mean \pm SD) according to depression grade.

DMFs	Depression grades									F	Sig
	Low			Medium			High				
	mean	S.D	S.E	mean	S.D	S.E	mean	S.D	S.E		
Ds	5.97	3.45	0.63	6.35	3.91	0.81	7.07	5.50	0.67	0.57	0.57
Missing	0.17	0.91	0.17	0	0	0	0.22	0.70	0.13	0.52	0.6
Filling	0.17	0.59	0.11	0	0	0	0.07	0.40	0.05	1.06	0.35
DMFs	7.72	5.05	0.94	4.61	3.46	0.72	7.34	4.72	0.43	3.53	0.03

LSD test					
Mean bet. Low&medium	P	Mean bet. Low&high grade	P	Mean bet. Medium&high	P
3.12	0.01	0.39	0.70	2.73	0.01

*Significant $P \leq 0.05$

Table 3: The severity of dental caries represented by grades of (D₁₋₄) according to depression grades by gender

	Depression grades									F	Sig
	Low			Medium			High				
	mean	S.D	S.E	mean	S.D	S.E	mean	S.D	S.E		
D1	1.73	1.50	0.27	1.87	1.49	0.31	1.54	1.79	0.22	0.39	0.68
D2	3.27	2.99	0.54	3.27	2.47	0.51	3.96	3.25	0.39	0.76	0.47
D3	0.73	1.14	0.21	1.04	1.52	0.31	0.84	1.64	0.20	0.24	0.79
D4	0.37	1.27	0.23	0.13	0.63	0.13	0.57	0.24	0.24	0.66	0.25

DISCUSSION

Dental caries is a disease that caused by many factors, including genetic, environmental, behavior, microbial all these factors contribute in order for initiation and development of dental caries⁽⁹⁾. In order to evaluate dental caries, DMFs index was used, DMF is an arithmetical index that measures the cumulative caries aggression of the individuals⁽²⁰⁾. Additional to that, caries severity was evaluated according to the lesion severity scales (D₁₋₄ MFS) depending on the lesion depth according to criteria described by Manji *et al.*⁽¹⁹⁾ as the present study conducted to measure the effect of depression grades on caries severity.

The high occurrence of dental caries (decayed surfaces) in internally displaced people in the current investigation (for all grades of depression) can be explained by: since dental caries is multifactorial disease⁽²¹⁾ and one of the most important factor that effect on it is socioeconomic status^(22,23) that include personal and social factor particularly low income, low education, low life style and behavior, low ability for utilization dental services^(24,25), high cost of dental treatment and in adequate dental center or it is far from their camping area. Because their difficulties and bad

environment that lead to less care in oral hygiene⁽²⁶⁾.

In the present study the sever grade of dental caries (D₄) were found to be more among high depression grade than the other grades while, D₁ (which is the lowest in severity) was found to be higher among low grade of depression so this result is accepted with Randy study at 2003 and this was due to: high depression grade cause impairment in function of immune system that lead to activation and colonization of pathogenic and cariogenic bacteria^(27,28). Mental health disorders which manifest as eating disorders such as anorexia⁽²⁹⁾. Depressed children and adolescent have more tendency for eating or taking sweet food and candy that give a pleasure to the brain but at the same time this type of food is cariogenic and lead to development of dental caries⁽³⁰⁾. depression is linked with decrease serotonin metabolism this lead to increase carbohydrate intake and this provide a good environment in development of acidic uric bacteria^(31,32). Increased caries activity in the context of antidepressant use has been shown in many studies⁽³³⁻³⁶⁾. One of the side effects of anti-depressive medications is reduction of salivary secretion, causing a condition known as

dry mouth or xerostomia. This, in turn exacerbates poor oral health and increase dental caries^(37,38). Filling among high depressed person were lower than among low depressed one, this was due to person with low depression more interest in their oral health than depressed one. While increasing in missing surfaces among high depression grade as compared with low grade was attributed to that: high depression grade causes severe stress is a predisposing factor to the development of acute dental caries^(39,40). This mean developing of rapid caries and previously mentioned that internally displaced people lived with low socioeconomic state and less access to dental services so this lead to increase severity of carious tooth inspite of expensiveness of dental treatment this lead carious tooth to be extracted rather than treated or it reach to situation that become non restorable tooth and need to be extracted.

On conclusion, the result from current study revealed that caries experience and caries severity increase with increasing depression grades among internally displaced people which have adverse effect on oral health.

REFERENCES

- 1- World Health Organization, World suicide prevention day 2012
- 2- American Psychiatric Association. Diagnostic and statistical manual of mental disorders (DSM-IV-TR). 4th, text. rev. ed. Washington, DC: Author; 2000.
- 3- World Health Organization. ICD-10. International Statistical Classification of Diseases and Related Health Problems 2010 - 10th Revision. Accessed 01/21, 2013.
- 4- Rayner L, Price A, Evans A, Valsraj K, Higginson IJ, Hotopf M. Antidepressants for depression in physically ill people. *Cochrane Database Syst Rev* 2010 Mar 17;(3)
- 5- World Health Organization (WHO). Depression 2017a. Retrieved from <http://www.who.int/mediacentre/factsheets/fs369/en/>
- 6- Tsuang MT, Faraone SV. *The genetics of mood disorders*. Baltimore, MD: Johns Hopkins University Press, 1990.
- 7- United Nations. Guiding Principles on Internal Displacement (New York: Office for the Coordination of Humanitarian Affairs.1999
- 8- Bowen WH, Quivey RG, Smith AV. Glucosyl transferase inactivation reduces dental caries. *J Dent Res*. 2001; 80(6):1505-1506.
- 9- Shaffer JR, Wang X, Desensi RS, Wendell S et al. Genetic susceptibility to dental caries on pit and fissure and smooth surfaces. *Caries research* 2012; 46(1):38-46.
- 10- American Academy of Pediatric Dentistry (AAPD). Guideline on Adolescent Oral Health Care. Reference manual. 2010; 35(6):23-14
- 11- Fadem B. Behavioral science in medicine. 2nd ed. Philadelphia. 2012.
- 12- Alan D, Rogol D, James N, Roemmich P et al. Growth at Puberty. *Adolescent Health J*. 2002; 31:192–200.
- 13- Coles, E., Chan, K., Collins, J., Humphris, G. M., Richards, D., Williams, B., & Freeman, R. Decayed and missing teeth and oral-health-related factors: Predicting depression in homeless people. *Journal of Psychosomatic Research* 2011;71(2), 108-112.
- 14- Wey, M. C., Loh, S., Doss, J. G., Abu Bakar, A. K., & Kisely, S. The oral health of people with chronic schizophrenia: A neglected public health burden. *Australian and New Zealand Journal of Psychiatry* 2016; 50(7), 685-694.
- 15- Heidari, E., Andiappan, M., Banerjee, A., & Newton, J. T. The oral health of individuals with dental phobia: A multivariate analysis of the adult dental health survey, 2009. *British Dental Journal* 2017; 222(8), 595-604.
- 16- Huda Al salman. Depression status in relation to oral health condition and salivary physiochemical characteristics among 15 years old school students in Al Sewera City-Wassit Governorate/ Iraq. Master Thesis. Collage of Dentistry, University of Baghdad, 2014.
- 17- Kovacs, M. Children Depression Inventory (CDI2) manual Toronto, Canada: Multi-Health Systems, 2011.
- 18- World Health Organization. Oral Health Survey: Basic Methods 4th ed. World Health Organization, Geneva. 1997
- 19- Manji F, Fejerkov O, Baelum V. Pattern of dental caries in an adult rural population. *Caries Res*. 1989; 23:55-62.
- 20- Hiremath S. S. Textbook of preventive and community dentistry, 2nd ed. India: Elsevier 2011.
- 21- Aas J. A., Griffen A. L., Dardis S. R., Lee A. M., Olsen I., Dewhirst F. E., Paster B. J. Bacteria of Dental Caries in Primary and Permanent Teeth in Children and Young Adults. *Journal of Clinical Microbiology* 2008; 46(4), 1407-17.
- 22- Al-Azawi LA. Oral health status and treatment among Iraqi five year old kindergarten children and fifteen years old students (A national survey). PhD thesis, university of Baghdad, Collage of Dentistry. 2000.
- 23- Abdul-Razzaq QR. Oral health status among 15 years old School students in Sulimania city – Iraq. Master thesis, College of Dentistry, University of Baghdad. 2007.
- 24- Pitts N., Amaechi B., Niederman R., Acevedo A., Vianna R., Ganss C., Honkala E. Global oral health inequalities: Dental caries task Group—Research agenda. *Advances in Dental Research* 2011; 23(2), 211-220.
- 25- Olusile A. O., Adeniyi A. A., & Orebanjo O. Self-rated oral health status, oral health service utilization, and oral hygiene practices among adult nigerians. *BMC Oral Health* 2014; 14, 140-6831-14-140.
- 26- World Health Organization. International Statistical Classification of Diseases and Health Related Problems. Geneva: Author; 2016
- 27- Randy L. Depression and dental health. *Clinical Update* 2003; 25(1):1-2.
- 28- Niedert C, Dorner B. Nutrition care of the older adult: a handbook for dietetics professionals working throughout the continuum of care. Chicago, Ill: American Dietetic Association 2009.
- 29- Kisely, S., Baghaie, H., Laloo, R., Siskind, D., & Johnson, N. W. A systematic review and meta-

- analysis of the association between poor oral health and severe mental illness. *Psychosomatic Medicine* 2015; 77(1), 83-92
- 30- Thongkumpala Y. Cariogenic Food Consumption Behaviors and Associated Factors in Primary School Students Wat Donwai School Tambon Bangkrateuk Amphur Sampran Nakhonpathom Province. *Medical Journal* 2010; 29(2).
- 31- Drewnowski A, Krahn D, Demitrack MA, Nairn K et al. Taste responses and preferences for sweet high –fat foods: evidence for opioid involvement. *Physical behave* 1992; 51:371-379.
- 32- Mennella JA, Pepino MY, Lehmann-Castor SM, Yourshaw LM. Sweet preferences and analgesia during childhood: effects of family history of alcoholism and depression. *Addiction* 2010; 105:666–75.
- 33- Rundegren J, van Dijken J, Mornstad H & von Knorring L. Oral conditions in patients receiving long-term treatment with cyclic antidepressant drugs. *Swed Dent J* 1985; 9: 55–64
- 34- von Knorring AL & Wahlin YB. Tricyclic antidepressants and dental caries in children. *Neuropsychobiology* 1986; 15: 143–145
- 35- Thomson WM, Slade GD & Spencer AJ. Dental caries experience and use of prescription medications among people aged 60+ in South Australia. *Gerodontology* 1995; 12: 104–110
- 36- Peeters FPML, deVries MW & Vissink A. Risks for oral health with the use of antidepressants. *General Hospital Psychiatry* 1998; 20: 150–154.
- 37- Anttila, S. S., Knuutila, M. L., & Sakki, T. K. Depressive symptoms favor abundant growth of salivary lactobacilli. *Psychosomatic Medicine* 1999; 61(4), 508-512
- 38- Okoro C. A., Strine T. W., Eke P. I., Dhingra S. S., Balluz L. S. The association between depression and anxiety and use of oral health services and tooth loss. *Community Dentistry and Oral Epidemiology* 2012; 40(2), 134-144
- 39- Borysenko M, Turesky S, Borysenko JZ, Quimby F & Benson H. Stress and dental caries in the rat. *J Behav Med* 1980; 3: 233–243
- 40- Honkala E, Mairi D and Kolmakow S. Dental caries and stress among South African political refugees. *Quintessence Int* 1992; 23: 579–583.

الخلاصة:

الخلفية: التغير في نمط الحياة مثل التهجير الداخلي ممكن ان يسبب الاكتئاب الذي هو اضطراب عقلي شائع يؤثر على الصحة العامة التي تؤثر على حدوث تسوس الاسنان وشدها. الهدف من الدراسة الحالية: هو لتقييم العلاقة بين حالة الاكتئاب على انتشار وشدة تسوس الاسنان بين النازحين داخليا. المواد والطرق: شملت العينة 121 نازحا داخليا تتراوح اعمارهم بين 13-17 سنة طريقة قياس الاكتئاب هي باستخدام استبيان جرد الاطفال. يتم قياس تسوس الاسنان باستخدام تجربة التسوس وشدة التسوس النتيجة: كانت القيمة المتوسطة للاسطح المسوسة والمفقودة والممتلئة اعلى بين مجموعة الاكتئاب المنخفض. بينما بالنسبة الى شدة التسوس, كانت القيمة المتوسطة الاعلى في السطح المتسوس ذي الشدة الاولى والثالثة في المجموعة المتوسطة بينما كانت السطوح المتسوسة ذي الشدة الثانية والرابعة ذات قيمة اعلى في مجموعة الاكتئاب المرتفعة.

الخلاصة: كان للاكتئاب بين النازحين داخليا تأثير على شدة التسوس الكلمات المفتاحية: الاكتئاب, النازحون داخليا, تجربة نخر الاسنان وشدها.