

Association between mental well-being, depression, and periodontal attachment level among young adults of the postwar Sebha city, Libya: A pilot study

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Abstract

Objectives: The present study was aimed to investigate the association of mental well-being and depression with periodontal clinical attachment loss among young adults in postwar urban population of Sebha city, Libya. **Materials and Methods:** Mental well-being and depression were assessed using Arabic versions of World Health Organization (WHO) five well-being index and major depression inventory (ICD-10), respectively. Random sample of 149 subjects were studied. Degree of periodontal attachment was measured at six sites per tooth using a rigid manual periodontal probe. **Result and Conclusion:** A total of 59.11% of the studied samples had healthy mental well-being state, whereas 40.81% had poor mental well-being. The severity of depression was stronger in males than in females. In the present study mental well-being, depression, and all its categories did not have any significant effect on periodontal attachment loss. Further studies and health interventions can be planned based on this data.

Key words: Depression, ICD-10, mental well-being, periodontal attachment loss, who-five well being

INTRODUCTION

Periodontal diseases are multifactorial, chronic inflammatory conditions, caused by the presence of subgingival periodontopathic bacteria, and compromised host response.^[1,2] A variety of factors including age, dental plaque accumulation, education, gender, race, systemic diseases such as diabetes and tobacco use have all been widely recognized as risk factors for periodontal disease.^[3-7]

A delicate, yet complicated relationship, exists between the immune system, endocrine system, nervous system, and

mental health.^[8] Psychosomatic conditions have a negative impact on the immune system^[9,10] and lack of mental well-being and depression can have a negative impact on life style, which will hamper the oral hygiene habits of an individual.^[11] Nevertheless psychological conditions are potential risk factors for periodontal diseases. Many studies have shown a weak and limited association of psychological factors, such as depression, stress, anxiety, loneliness, marital status, negative life events, daily strain, occupational stress, life satisfaction, personality traits, and coping behavior with periodontal diseases.^[12-19] Several other studies have also failed to show any relationship between psychosocial factors and periodontal status.^[20-22]

Libya is an oil rich country situated in the northern edge of Africa. Sebha, a city in the midst of Libyan Sahara desert, is the largest urban population situated in its south. Libya like other Arab countries across the Middle East and North Africa (MENA) region had gone through unfortunate war during the much publicized Arab spring. Information on oral health status, periodontal status of its inhabitants is

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scarce, and there is no known research that has measured the psychological state of Sebha population ever. Hence, this study was designed to investigate the association between mental well-being, depression, and clinical attachment loss (CAL) among young adults in postwar urban population of Sebha city, Libya.

MATERIALS AND METHODS

Selection of subjects

This was a pilot study done among young adults of postwar Sebha city, Libya to check the feasibility to conduct a large scale epidemiological cross sectional study among the general population of Sebha, Libya. A random sampling method was employed. The study was conducted over a period of 2 months from January to March 2013. The 147 subjects who accepted to participate and signed the informed consent were examined.

Inclusion and exclusion criteria

To be included in the study, subjects had to be dentate between 18 and 35 years of age with a minimum of 20 remaining natural teeth excluding third molars. Those excluded were subjects with known psychological disorders, under antibiotic or antiinflammatory drugs, with systemic diseases, smokers and tobacco users, pregnant women, who had undergone recent periodontal phase-I therapy, with oral pathological diseases and other painful lesions, undergoing orthodontic treatment and those who were out of Libya during the war.

Clinical examination

Periodontal CAL was measured at six sites (Mesio-buccal, Mid-buccal, Disto-buccal, Disto-lingual, Mid-Lingual, and Mesio-lingual) per tooth from the cemento-enamel junction to the base of the pocket using a rigid manual periodontal probe (UNC-15). All the clinical examinations were carried out by a single trained calibrated examiner and intraexaminer reproducibility was assessed through kappa analysis and it was found to be 0.86. Mean periodontal CAL was calculated and it was categorized into healthy (0-1 mm), low (1.1-2 mm), moderate (2.1-3.0 mm), high (3.1-4.0 mm), and severe (above 4 mm).^[23]

Questionnaires

General psychological well-being of the subjects was assessed using World Health Organization (WHO) (five) well-being index, which is a self-administered scale known for its simplicity, efficiency, and ease of use.^[24-26] This five item scale has scores of range from 0 to 5. Each item of the scale assesses the positive well-being of the person for over 2 weeks. The overall score is calculated by adding up the scores of all the questions. The overall raw score

ranged from 0 to 25. It is recommended to administer the Major Depression (ICD-10) Inventory if the WHO (five) well-being index score is below 13 or if the patient has answered 0 to 1 to any of the five items as it indicates poor well-being.^[27] Major depression inventory (ICD-10) is a brief, seemingly reliable, self-rating depression inventory developed by the WHO based on the Diagnostic and Statistical Manual of Mental Disorders (DSM)-system, which allows clinicians not only to assess the presence of a depressive disorder according to the DSM-IV, but also to assess the severity of the depressive symptoms in brief.^[28,29] It was used to measure the depression status of individuals. It consists of 10 items of how a subject felt over the past 2 weeks with the last two items having two questions each. Each question's response was scored on a 6 point scale of 0 to 5. The completed major Depression Inventory scores categorize subjects into those with mild, moderate, severe, and major depression. The Arabic version of both the questionnaires was used in the present study.^[30]

Statistical analysis

The statistical analysis was performed using SPSS software package 17.0 (Chicago, IL, USA). The data procured by questionnaires was validated by analyzing the internal consistency using Cronbach's alpha and correlation coefficient. The association between the questionnaire data and accumulative periodontal CAL were analyzed using Chi-square test, Pearson's correlation, analysis of variance (ANOVA), and multiple regression analysis. The significance level of $P < 0.05$ was adopted throughout the study.

RESULTS

[Table 1] The above table shows distribution of sample according to WHO well-being score in relation to the periodontal CAL. When the periodontal CAL was compared with the well-being index scores, both the groups, that is group A and group B, no significant difference was observed between them. Most of the sample in both the groups had a healthy periodontal clinical attachment level, which is 70% and 72.41% in groups A and B, respectively. When Pearson's correlation was analyzed, it showed that there was negative correlation between WHO well-being scores and periodontal attachment loss (CAL), but it was not significant.

Table 2 shows distribution of sample who were having WHO (five) well-being index score of below 13 or those who answered 0 to 1 to any of the five items, they were in turn divided into major, mild, moderate, and severe depression categories with periodontal attachment loss (CAL) categories. There was no significant difference

Table 1: WHO (Five) well-being index and periodontal attachment loss

WHO (five) well-being index	Healthy (%)	Low (%)	Moderate (%)	Severe (%)	Total 147
Group A: Scores below 13 or has answered 0 to 1 to any of the five items	42 (70)	10 (16.66)	7 (11.66)	1 (1.66)	60
Group B: Scores above 13	63 (72.41)	17 (19.54)	6 (6.89)	1 (1.14)	87

Chi-square value: 1.172, P : 0.760 (not significant), Pearson correlation value: -0.031, WHO: World health organization

Table 2: Major depression inventory (ICD-10) and periodontal clinical attachment level in the group of WHO well-being score below 13 or those who answered 0 to 1 to any of the five items

ICD-10	Healthy (%)	Low (%)	Moderate (%)	Severe (%)	Total 60
Major	8 (72.72)	2 (18.18)	1 (9.09)	0	11
Mild	31 (72.09)	5 (11.62)	6 (13.95)	1 (2.32)	43
Moderate	3 (60)	2 (40)	0	0	5
Severe	1 (100)	0	0	0	1

Chi square value: 4.94, P =0.960 (not significant), Pearson's correlation value: 0.076, WHO: World health organization, ICD: ICD-10

Table 3: WHO (Five) well-being index score with gender (overall population)

Sex	Well-being score below 13 or those who answered 0 or 1 to any of the items (%)	Well-being score above 13 (%)	Total
Female	44 (43.56)	57 (56.44)	101
Male	16 (34.78)	30 (65.22)	46
Total	60 (40.81)	87 (59.11)	147

Chi-square value: 1.009, P : 0.315 (not significant), WHO: World health organization

Table 4: Gender and periodontal clinical attachment loss

Sex	Healthy (%)	Low (%)	Moderate (%)	Severe (%)	Total
Female	70 (69.30)	22 (21.78)	7 (6.93)	2 (2.17)	101
Male	35 (76.08)	5 (10.86)	6 (13.04)	0	46
Total	105	27	13	2	147

Chi-square value: 4.49, P =0.212 (Not significant)

between the groups and most of those in the samples who had depression had mild, followed by major, moderate, and severe depression. And in all these groups most of the subjects had healthy, followed by low, moderate, and severe periodontal CAL. Pearson's correlation between major depression inventory and periodontal clinical attachment level showed that there was positive correlation between these factors but was, however, not significant. In the present study, depression, and all its categories, did not have any effect on periodontal attachment loss.

[Table 3] In both males and females there was less number of subjects in group of WHO score below 13 and there were no significant differences between males and females. The 59.11% of the studied sample had healthy mental well-being state, whereas 40.81% had poor mental well-being.

Table 4 shows gender wise distribution of subjects according to periodontal clinical attachment level categories, in both males and females. Most of the subjects belonged to healthy CAL category followed by low,

moderate, and severe category. However, there was no significant difference between males and females in any of the periodontal CAL categories.

Table 5 shows gender wise distribution of subjects according to depression categories in the group of subjects who had WHO (five) well-being index scores less than 13. Here most of the females belonged to mild depression category followed by major, moderate, and severe depression categories, but in males there were equal number of subjects in both mild and major depression categories followed by moderate depression category. Significantly, fewer males compared with females had mild depression while majority of males had moderate to major depression. Pearson's correlation value between major depression inventory and gender was 0.355. There was positive correlation between these two factors and it was statistically significant at $P = 0.01$.

When ANOVA was calculated, the ANOVA value was 5.483, $P = 0.007$ (significant at the level of $P = 0.01$). Significant difference among males and females in relation to depression was observed.

[Table 6] Regression analysis showed that there was no significant predictor for periodontal CAL. That is, neither gender nor WHO (five) well-being index score had any significant influence on periodontal attachment loss (CAL).

[Table 6a] Regression analysis showed that there was no significant predictor for periodontal CAL, that is, neither gender nor ICD-10 scores had any significant influence on periodontal CAL.

DISCUSSION

To best of our knowledge, this is the first study ever done among the young adult Libyan population using any

Table 5: Sex and major depression inventory (ICD-10) in group of WHO (Five) well-being index score below 13

Sex	Mild (%)	Moderate (%)	Major (%)	Severe (%)	Total
Female	36 (81.81)	3 (6.81)	4 (9.09)	1 (2.27)	44
Male	7 (43.75)	2 (12.50)	7 (43.75)	0	16
Total	43	5	11	1	60

Chi-square value: 11.316, $P=0.023$ (Significant at level of $P=0.05$), Pearson's correlation value: 0.355 (Positive correlation, significant at $P: 0.01$), ICD: ICD-10, WHO: World health organization

Table 6: Multiple regression analysis with periodontal clinical attachment loss as a dependent variable among whole sample

Parameter	Beta value	P value	Constant	Adjusted R ²
WHO Well-being score	-0.031	0.713	1.026	-0.012
Gender	-0.188	0.128		

WHO: World health organization, Not significant

Table 6a: Multiple regression analysis with periodontal CAL as a dependent variable among subjects with WHO (Five) well-being index score less than 13

Parameter	Beta value	P value	Constant	Adjusted R ²
Total ICD score	0.152	0.277	0.972	0.0132
Gender	-0.214	0.128		

CAL: Clinical attachment loss, WHO: World health organization, ICD: ICD-10, Not significant

psychological scale. It was also the first among the whole population using WHO (five) well-being index and major depression inventory (ICD-10) and the first to evaluate the association of periodontal CAL with psychological factors using WHO (five) well-being index and major depression inventory (ICD-10).

Systemic diseases such as diabetes and age are known risk factors for periodontal disease and the young adult population was taken into consideration in the present study to rule them out.

In the present study, we found more men to have higher levels of depression than women while depression is generally common in females than in men elsewhere.^[31] The reason may be that in postwar situation, and in a conservative society like Libya, men venture out of their homes and safe zones often and are hence more exposed to factors that could raise levels of depression among them. In the present study, we found no significant relation between WHO (five) well-being index score with accumulative periodontal attachment loss and this was in confirmation with a study by Hugoson *et al.*, where well-being was analyzed with four items according to the center for epidemiological studies depression scale (CES-D).^[15] It was

also found that mental well-being in the studied Libyan population showed no significant difference across genders. In the present study, no significant association was found between periodontal CAL and depression, which was similar to the results of Vettore *et al.*,^[32] Castro *et al.*,^[33] and Torabi-Gaarden *et al.*^[34]

Limitations of the study: This being a cross sectional study, it inherently lacks the power to prove causality, rather could lend support to the hypothesis; the periodontal CAL was the only periodontal parameter examined, although it is the best among the clinical parameters; the clinical parameters cannot assess precisely the loss of periodontal attachment, which can only be done by histometric methods;^[35-37] and lastly, south Libya, in general and Sebha city in particular, has a patchy mixture of different races, the African and the Arab interracial differences were not recorded due to cultural sensitivities. One should also know that CAL is an accumulative measure of periodontal destruction, whereas the psychometric scales generally measure the state for a limited period in an individual's near short-memory, which for example in the case of ICD-10 is 2 weeks.

CONCLUSION

Within the reaches of this study, we observed that a sizable portion of the studied population was depressed. We also found that men have higher grades of depression than women and no statistically significant association between depression and periodontal CAL can be suggested in the Libyan young adults. It is suggested that similar studies be carried out with larger sample sizes among different cultural and ethnic populations so as to get a better understanding of the effects of psychological characteristics and traits on the periodontal status.

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