



Evaluation of Oral Health Related Quality of Life in a group of patients with aggressive periodontitis and a group of healthy subjects

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Abstract

Background: Aggressive periodontitis is an inflammatory disease initiated by mixed opportunistic bacterial pathogens in the dental plaque biofilm. aggressive periodontitis often leads to loss of supporting soft and hard tissues around a tooth.

Diagnosis of aggressive periodontitis has often been based on clinical parameters such as probing pockets depths, clinical attachment levels, bleeding on probing, mobility scores and gingival recession. Unfortunately, such parameters show no indication of how the disease affects the patients themselves. Of recent years, patient-centered assessments such as Oral Health-Related Quality of Life (OHRQoL) are increasingly appreciated and being applied. Such measures include the functional, psychological and social consequences of oral conditions for the individual, and not only signs and symptoms of the disease itself. The aim of the present study was to assess the Oral Health-Related Quality of Life among Groups of Aggressive Periodontitis Patient and Healthy.

Methods: A Comparative descriptive cross-sectional study was conducted at the periodontology clinics Faculty of Dentistry, University of Khartoum and Khartoum Dental Teaching Hospital. The sample consisted of 46 individuals with aggressive periodontitis and 46 individuals' healthy individuals without periodontal disease. Data were collected on age, gender and the Oral Health Impact Profile (OHIP-14) was administered in interview format for the evaluation of the impact on quality of life. Clinical examinations were performed and was filled out for each participant, on Plaque Index, Bleeding on Probing, probing depth, and clinical attachment loss were recorded.

All participants received clarifications regarding the objectives and procedures of the study and agreed to participate by signing a statement of informed consent.

Results: A total of 92 subjects were enrolled in the study. The female gender was predominant in the two groups: 87% of the aggressive periodontitis group and 76.1% in the healthy group. Among aggressive periodontitis group (47.8 %) were diagnosed with generalized periodontitis while (52.2 %) diagnosed with localized aggressive periodontitis.

The aggressive periodontitis group had a negative effect on their OHRQoL regarding functional limitation, physical pain, psychological discomfort, physical disability, social disability and handicap domains.

Conclusion: This study demonstrates a significant association between oral health-related QoL and aggressive periodontitis.

Key words: Aggressive Periodontitis, OHRQoL

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Introduction

Aggressive periodontitis (AgP) is a significant health problem in certain populations. Estimates of aggressive periodontitis vary widely from 0-0.17 % with a rate of % in the developed nations and 5% in under-developed nations^[1].

There is sparse information about the prevalence of aggressive periodontitis in Sudan. A survey of 1200 students of the 13-19 years' age group selected from 38 public and private high schools in Khartoum state reported a prevalence of 3.1% for aggressive periodontitis^[2]. Symptoms of aggressive periodontitis are highly significant from the patients' point of view, as the disease progress the periodontal attachment apparatus is reduced, resulting in tooth mobility, migration and may finally results in tooth loss, impaired function and poor dental aesthetics ensuing poor quality of life in terms of physical as well as psychosocial well-being^[3].

A better understanding of the ramifications of aggressive periodontitis on patients' perceptions of how their oral health affects their daily lives can help to ensure that the planning and evaluation of peri-

odontal care and management adequately address patients' needs and concerns^[4,5]. The use of patient-centered measures in dentistry is increasing. A number of instruments have emerged with auspicious psychometric properties^[6].

Since aggressive periodontitis is more predominant amongst young individuals and has a predilection toward females who concern much about their esthetics in such age, this will result in substantial adverse effects on their daily quality of life (QoL). However, little is known about this issue in Sudanese population^[7].

Therefore, this research area deserves further study in order to evaluate the impact of aggressive periodontitis on the quality of life. So, the purpose of this study is to cover the aforementioned issue.

Material and Methods

The study was a cross-sectional study in a group of patients diagnosed with aggressive periodontitis and a group of healthy subjects without periodontitis. The study participants were recruited from among those attending outpatient and periodontology dental clinics at Faculty of Dentistry University of Khartoum and Khartoum Teaching Dental Hospital.

A total number of 92 patients (46 aggressive periodontitis patients and 46 healthy subjects) were included in the study. A previous approval was obtained from the Research Ethics Committee of the Faculty of Medicine, University of Khartoum in order to conduct the study, and written consents were taken from the patients who agreed to be part of the study. Subjects were diagnosed in agreement with the clinical criteria for AgP approved by consensus at the World Workshop in Periodontics in 1999^[8].

Subjects who have interproximal attachment loss in at least two permanent teeth, one of which is a first molar, and which affects no more than two other teeth, apart from the first molars and incisors was diagnosed as had localized aggressive periodontitis and subjects who had more than eight teeth with attachment loss of >5 mm and probing depth of >6 mm and at least three affected teeth that were not first molars or incisors were diagnosed as had aggressive periodontitis^[8].

Healthy individuals with probing depth (PD) <3 mm in all teeth and absence of clinical attachment loss (CAL) determined for their quality of life.

The impact of aggressive periodontitis on patients' QoL was assessed using the Arabic version of Oral Health Impact Profile (OHIP-14) which was previously validated and published in Sudan^[9]. OHIP-14 is a self-completed questionnaire consisting of 14 items subdivided into

seven domains: functional limitation, physical discomfort, psychological discomfort, physical disability, psychological disability, social disability, and handicap. These seven conceptual domains were derived from the oral health model described by Locker^[10]. The instrument's psychometric properties, validity and reliability have been measured, and good results were attained^[11]. The answers of the questionnaire were recorded on a Likert scale, with values ranging from 0 to 4. A lower Likert scale value indicates higher QoL^[12].

The questionnaires were filled in a face-to-face interview. The questionnaires were administered in a standard manner, with the initial explanation given by the same clinician to all participants (Y.A.).

Periodontal examinations were conducted by one calibrated examiner (Y.A.). Before the commencement of the study, the examiner was trained to satisfactory levels of accuracy and reproducibility in recording the clinical parameters and indices.

Each patient underwent a comprehensive periodontal examination as part of his or her routine assessment. The examination included assessing the number of missing teeth; the number of mobile teeth; and periodontal measures such as plaque index (PI), bleeding on probing (BoP), and Clinical attachment loss (CAL). Clinical parameters were measured at six sites per tooth (mesio-buccal, buccal, disto-buccal, disto-lingual, lingual and mesio-lingual) in all teeth, except third molars, using a Williams probe (PCP-12, Hu-Friedy, Chicago, IL).

Data analysis

Data was analyzed using the statistical package SPSS 22.0 software program (Chicago, IL). Mean and standard deviations were calculated. T-test was used for variations in mean OHIP-14 scores among aggressive periodontitis and healthy group. The relation between OHIP-14 scores and clinical periodontal measures was examined through a Pearson correlation coefficient test. The level of significance was set at 0.05 for the tests.

Results

A total of 92 participants were included and categorized into two groups, an aggressive periodontitis group and a healthy group free of periodontal disease. All of the participants were included in the final analysis.

Of the 92 participants, 75 (82%) were females and 17 (18%) were males. Aggressive periodontitis group included 40 females and 6 males, while healthy group included 35 females and 11 males. The mean age of aggressive periodontitis group was 23.8 ± 3.5 years, and the mean age of the healthy group was 27.2 ± 7.3 table (1).

		Healthy	Aggressive periodontitis
Gender	Male	11 (23.9)	6 (13)
	Female	35 (76.1)	40 (87)
Age (Mean ± SD)		27.2 ± 7.3	23.8 ± 3.5

Table 1: Demographic characteristics of the study and healthy groups

Aggressive periodontitis group was subdivided into localized aggressive periodontitis patients which included 24 patients (52.2%) and generalized aggressive periodontitis which included 22 patients (47.8%). The mean of the OHIP-14 scores is shown for each group (table (3),

with means of 15.28 ±8.94 for aggressive periodontitis group and 4.93 ±6.35 for healthy group. A statistically significant difference (p = 0.001) for OHIP-14 scores was observed between aggressive periodontitis group and the healthy group, indicating a poorer OHRQoL perception for patients who were diagnosed with aggressive periodontitis (Table 2).

	Healthy		Aggressive period		P value
	Mean	SD	Mean	SD	
Functional limitation	0.26	0.74	1.02	1.54	0.004**
Physical pain	1.26	1.34	4.35	1.74	0.001**
Psychological discomfort	0.63	1.06	1.78	1.56	0.001**
Physical disability	0.67	1.51	2.85	2.18	0.001**
Psychological disability	0.83	1.37	2.41	1.76	0.001**
Social disability	0.78	1.59	1.85	1.58	0.002**
Handicap	0.50	1.03	1.02	1.39	0.044*
Total OHIP	4.93	6.35	15.28	8.94	0.001**

Table 2: Comparison of the mean scores of the seven domains of OHIP-14 in aggressive periodontitis and healthy groups
Independent sample's T test performed *P value is significant

Furthermore, table (2) presents values obtained from each of the seven domains assessed by the OHIP-14. In the seven domains, statistically significant differences were seen between the groups. When comparing OHIP-14 scores in localized and generalized aggressive periodontitis subgroups in the functional limitation section, there was no statistically significant difference between the LAP group and the GAP (p =0.152), reflecting equal perception of functional limitation in the two groups.

In the Psychological Discomfort domain, the LAP group showed a significantly reduced value compared to the GAP group (p =0.01). In the remaining domains (Physical Disability, Psychological Disability, Social Disability, Handicap), statistically significant differences were detected between the two groups. (p=.001, .03, .02,.001,.002 respectively) (table 3).

	Generalized AP		Localized AP		P value
	Mean	SD	Mean	SD	
Functional limitation	1.36	1.33	0.71	1.68	0.152
Physical pain	5.18	1.56	3.58	1.56	0.001**
Psychological discomfort	2.36	1.62	1.25	1.33	0.014*
Physical disability	3.55	2.02	2.21	2.17	0.036*
Psychological disability	3.00	1.54	1.88	1.80	0.029*
Social disability	2.77	1.57	1.00	1.02	0.001**
Handicap	1.68	1.62	0.42	0.78	0.002**
Total OHIP	19.91	8.01	11.04	7.66	0.001**

Table 3: Comparison of the mean scores of the 7 domains of OHIP -14 in localized and generalized aggressive periodontitis

It was notable that the LAP group exhibited better perception than participants with generalized forms of the disease in all domains except the functional limitation domain.

Regarding the mean scores of OHIP-14 among gender, no difference could be detected for male versus female subjects in aggressive periodontitis and healthy groups (table 4).

The mean values of the clinical periodontal parameters of the patients

in this study were (1.25±.19) for the PI; 6.14±1.04 for CAL and 25.23±8.8 for the BOP table (5).

There were statistically significant relationships between BOB, CAL and OHIP -14 scores (p=0.001) table (5). Likewise, statistically significant relationships between the clinical periodontal parameters BOP and CAL and Functional limitation, Physical disability, Social disability, and Handicap domains (p=0.007, 0.008, 0.007, 0.001) respectively table (6).

	Health					Aggressive periodontitis				
	Male		Female		P value	Male		Female		P value
	Mean	SD	Mean	SD		Mean	SD	Mean	SD	
Functional limitation	0.18	0.60	0.29	0.79	0.691	3.17	2.64	0.70	1.02	0.071
Physical pain	1.00	1.00	1.34	1.43	0.384	4.67	1.21	4.30	1.81	0.636
Psychological discomfort	0.45	1.04	0.69	1.08	0.535	2.33	0.82	1.70	1.64	0.159
Physical disability	0.18	0.60	0.83	1.67	0.061	3.50	2.43	2.75	2.16	0.438
Psychological disability	0.73	1.85	0.86	1.22	0.788	3.67	1.51	2.23	1.73	0.06
Social disability	1.00	2.32	0.71	1.32	0.609	1.83	1.94	1.85	1.55	0.981
Handicap	0.55	1.21	0.49	0.98	0.869	1.67	1.86	0.93	1.31	0.227
Total OHIP	4.09	7.60	5.20	6.00	0.619	20.83	8.18	14.45	8.85	0.104

Table 4: Comparison of OHIP-14 scores in male versus female subjects in aggressive periodontitis and healthy groups Independent sample's T test performed *P value is significant

	Mean	SD
PI	1.25	0.19
BOP	25.23	8.80
Cal	6.14	1.04

Table 5: The mean values of the periodontal parameters in aggressive periodontitis group

	PI	BoP	CAL
Pearson Correlation	0.008	.323*	0.480**
P value	0.964	0.029	0.001

Table 6: Pearson Correlation between periodontal parameters and mean OHIP-14 score in aggressive periodontitis group *P value is significant

A significant relationship was also detected between CAL and Psychological disability ($p=0.04$).

linear regression analysis was used to correlate the relation between (BOP, CAL) and OHIP-14 score. The explanatory powers, R^2 for BOP and CAL were = 0.104, 0.23 respectively. Figures (1,2).

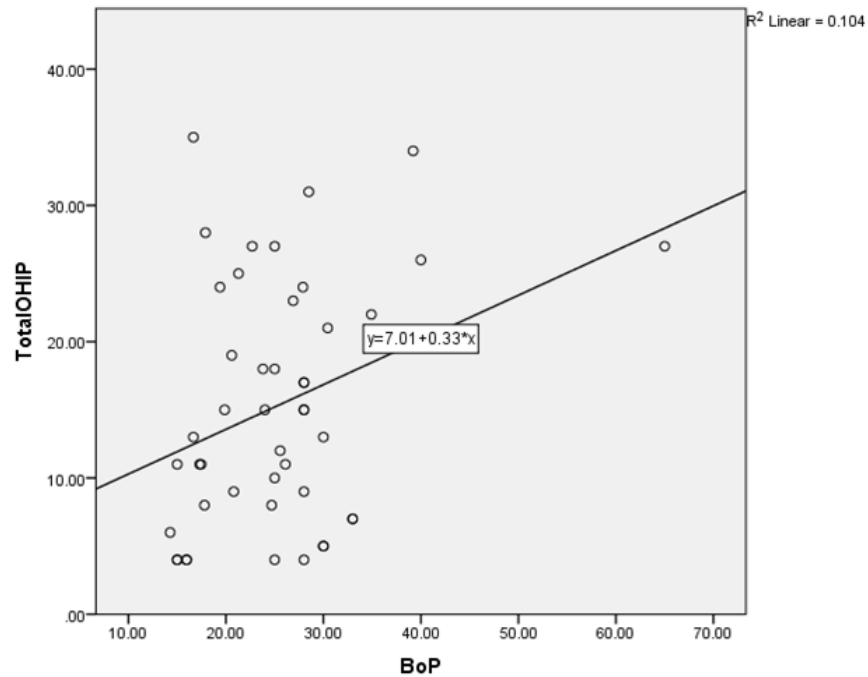


Figure 1: Linear Regression Analysis in which the independent variable is BOP and the dependent variable is the Total OHIP-14 Score

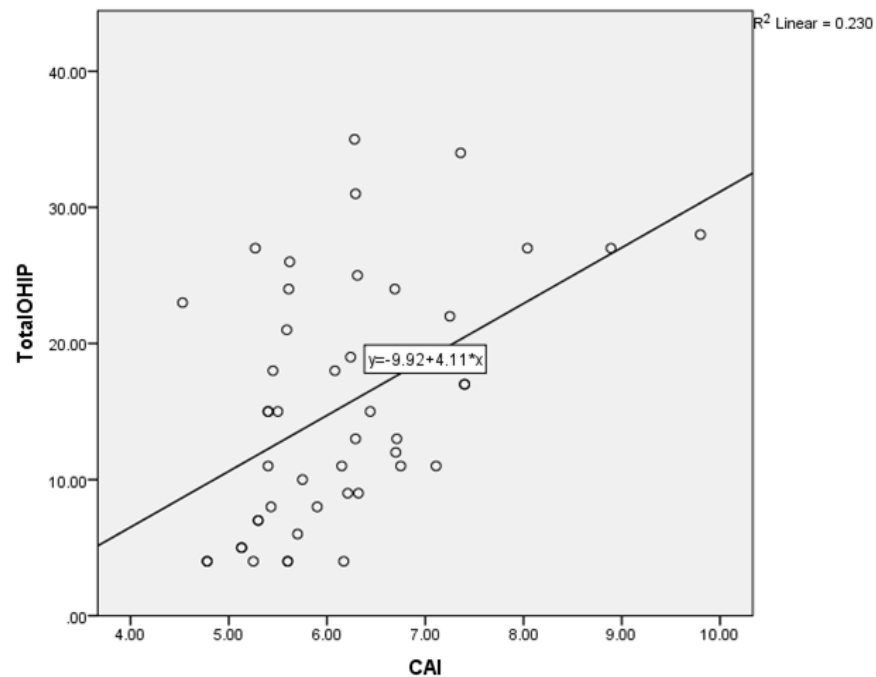


Figure 2: Linear Regression Analysis in which the independent variable is CAL and the dependent variable is the Total OHIP-14 Score

The number of mobile teeth was 29 teeth (63%) and the means number of missing teeth in localized and generalized aggressive periodontitis patients were 1.67±2.24 and 9.86±6.99 respectively. A significant negative correlation was observed between the number of missing teeth and the Psychological discomfort domain in generalized aggressive periodontitis patients (p=0.005) table (7).

Regarding teeth mobility, the mean OHIP-14 score was greater in patients with teeth mobility than those without teeth mobility (p=0.02) table (8).

It was found that 4 items of OHIP-14 questionnaire were affected by mobility of teeth. There were statistically significant relationships between psychological discomfort, Physical disability, Social disability and tooth mobility (p= 0.017, 0.008, 0.025 respectively) (table 9).

		PI	BoP	CAL
Functional limitation	<i>Pearson Correlation</i>	0.034	-0.015	0.391**
	<i>P value</i>	0.844	0.923	0.007
Physical pain	<i>Pearson Correlation</i>	-0.013	0.233	0.227
	<i>P value</i>	0.939	0.119	0.13
Psychological discomfort	<i>Pearson Correlation</i>	-0.019	0.225	0.265
	<i>P value</i>	0.913	0.132	0.075
Physical disability	<i>Pearson Correlation</i>	-0.018	0.414**	0.385**
	<i>P value</i>	0.917	0.004	0.008
Psychological disability	<i>Pearson Correlation</i>	-0.121	0.26	0.301*
	<i>P value</i>	0.489	0.081	0.042
Social disability	<i>Pearson Correlation</i>	-0.005	0.301*	0.393**
	<i>P value</i>	0.98	0.042	0.007
Handicap	<i>Pearson Correlation</i>	0.22	0.229	0.641**
	<i>P value</i>	0.204	0.125	0.001

Table 7: Correlation between periodontal parameters and each OHIP-14 domain
*P value is significant

		Functional limitation	Physical pain	Psychological discomfort	Physical disability	Psychological disability	Social disability	Handicap	Total OHIP
Generalized AP	<i>Pearson Correlation</i>	-0.251	-0.006	-0.571**	-0.393	-0.335	-0.345	0.013	-0.387
	<i>P value</i>	0.261	0.978	0.005	0.07	0.127	0.115	0.955	0.075
Localized AP	<i>Pearson Correlation</i>	0.227	0.008	-0.132	0.015	0.011	-0.019	0.284	0.062
	<i>P value</i>	0.286	0.969	0.54	0.945	0.96	0.93	0.179	0.775

Table 8: Correlation between mean scores of OHIP-14 domains and number of missing teeth of generalized and localized aggressive periodontitis
*Correlation is significant

	No mobility (grade 0 & 1)		Mobility (grade 2 & 3)		P value
	Mean	SD	Mean	SD	
Functional limitation	0.88	1.93	1.10	1.29	0.644
Physical pain	3.88	1.32	4.62	1.92	0.168
Psychological discomfort	1.12	1.22	2.17	1.63	0.017*
Physical disability	1.82	1.67	3.45	2.25	0.008**
Psychological disability	1.88	1.69	2.72	1.75	0.118
Social disability	1.18	1.51	2.24	1.50	0.025*
Handicap	0.59	1.18	1.28	1.46	0.106
Total OHIP	11.35	7.39	17.59	9.08	0.021*

Table 9: Correlation of mean score of OHIP-14 domains and tooth mobility independent sample's T test performed *P value is significant

Discussion

Assessing the effect of impaired oral health from the patient's perspective has emerged as an imperative research area^[13]. This has led to an increase in the use of patient-centered oral health status measures, mainly attempting to measure the impact of oral health on QoL.

The present study investigated the impact of aggressive periodontitis on oral health related quality of life in individuals attending periodontology clinics at Faculty of Dentistry University of Khartoum and Khartoum Teaching Dental Hospital and compared it with individuals without periodontitis from the same areas, by using OHIP-14 questionnaire.

The study showed that aggressive periodontitis has a direct relationship with oral health related quality of life (OHRQoL) measured by the OHIP-14 total score in Sudanese adults' population, reflecting that aggressive periodontitis patients have a poorer perception of OHRQoL than healthy group.

Besides physical pain, functional limitation, psychological discomfort, physical disability, psychological disability and handicap domains were also affected by aggressive periodontitis. These findings suggest that not only the physical functioning, but also pleasurable life experiences, such as relaxation and social interaction, can be affected by the oral conditions of periodontal patients. This draws attention to the influence of periodontal condition on daily life and its significance for overall QoL^[14]. The majority of previous studies concluded that periodontal diseases are associated with a worse health-related quality of life, and this impact increases with disease severity and revealed a significant association between periodontitis with worse scores in psychological discomfort and physical disability and the overall OHIP-14 score^[15,16].

Furthermore, the present study revealed that LAP is the group has a better OHRQoL score than GAP with a statistically significant difference. In addition, the mean values of various OHIP-14 domains were also higher in generalized aggressive periodontitis group than localized aggressive periodontitis group with statistically significant differences

seen in the Physical pain, physical disability, Psychological discomfort, psychological disability, social disability and handicap domains.

This could be related to the impact of the clinical characteristics with statistically significant differences, such as the increased percentage of BoP, more sites with CAL and an increased number of mobile and missing teeth, compared to the LAP group.

Periodontal disease usually measured by measuring pocket depth and clinical attachment loss which are considered as surrogate markers, on the other hand Bleeding on Probing is used as a tangible measure to capture patients' perceptions of disease and is used to complement the conventional clinical (surrogate) measures. These subjective measures have been described to be more pertinent to patient's daily lives than objective changes in PPD and CAL^[17].

Regarding clinical evaluation, the study revealed that the periodontal parameters most affecting QoL were BoP, CAL and tooth mobility.

BoP and CAL were significantly associated with oral health-related QoL. As both of them have significantly higher scores on the total OHIP-14 and various subscales, except physical pain and Psychological discomfort subscales.

That is, people might think that their self-conscious would not be significantly affected because of their periodontal status. Reflecting the cultural specificity which may also be one of the reasons accounting for such thinking, that most of Sudanese population have emotional control that does not allow the psychological discomfort caused by periodontal conditions to interfere in their self-conscious and to let them feeling tense.

Additionally, the linear regression analysis had explanatory power of 0.104, 0.23 for BoP and CAL respectively. Thus, BOP and CAL constitute factors that affect the oral health-related quality of life.

While there is not enough research about the impacts of periodontal clinical parameters of aggressive periodontitis on OHRQoL, a limited number of studies reported the effect of gingival bleeding and CAL on OHRQoL^[14,18,19].

The result from the present study agrees with previous studies, which have found that BoP and CAL may have an impact on quality of life in patients with periodontitis^[3,14,20].

The current study, found that the number of missing teeth negatively affected Psychological discomfort domain in generalized aggressive periodontitis group. Previous studies reported a close relationship between missing teeth and OHRQoL^[14,21].

Furthermore, the findings of this study in regards to tooth mobility revealed that, mobile teeth affected the OHRQoL. Psychological discomfort, Physical disability, Social disability domains were the items most affected by tooth mobility. No published research is found in the literature that evaluated the effect of mobile teeth on OHRQoL.

Conclusion

The findings of this study, illustrate the negative impacts of aggressive periodontitis on an individual's OHRQoL. In addition, OHIP-14 score was higher in generalized aggressive periodontitis group than localized aggressive periodontitis group. out of all the OHIP-14 domains, physical pain, physical disability, Psychological disability, psychological discomfort, Social disability and Handicap domains were the most significantly affected in generalized aggressive periodontitis group.

Strengths of the Study

This is the first study in Sudan to investigate OHRQoL in aggressive periodontitis patients. We applied the Arabic version of the OHIP-14, an instrument commonly used for adults and elderly people, which was validated in another study among Sudanese population^[9].

Together with self-assessed periodontal health outcomes, clinical periodontal examination was done on all study participants, and reliability tests showed good consistency of the obtained clinical data.

Limitations of the Study

Due to the cross-sectional study design, no causal relationships in the association between OHRQoL and the factors studied in the prevalence of low OHRQoL over time can be determined.

Only aggressive periodontitis patients were participated in the study, which may limit the generalization of our findings to the other Sudanese population with other types of periodontal disease.

Moreover, only clinical periodontal examination was applied during the study; radiographs were not taken, which could lead to lack of information regarding the amount of bone loss. Thus, the possibility to implement the new classification of periodontal disease (2017) in the current study to determine the grading of the condition was ruled out.

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