

## Oral Health Related Quality of Life Among Adults Attending Periodontal Clinic at IIUM Kuantan

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### Abstract

There was lack of local study assessing the oral health related quality of life (OHRQOL) of patients with periodontal diseases. Hence, this study aims to assess the OHRQOL and its associated factors in adult patients who were diagnosed with gingivitis and periodontitis.

This was a cross sectional study conducted from May to December 2018 among 100 participants attended Periodontal Clinic, Kulliyah of Dentistry of International Islamic University of Malaysia (IIUM) using purposive sampling methods. Clinical parameters of participants were recorded by a single examiner then followed by a self-administered questionnaire using the validated short version of Oral Health Impact Profile (S-OHIP) (Malay) to assess the OHRQOL and its associated factors. The OHRQOL of participants were reported using mean and standard deviation. The factors associated with OHRQOL were determined using independent t-test and Spearman correlation test.

The mean score for S-OHIP was  $14.73 \pm 9.24$ . Participants with periodontitis have higher S-OHIP score compared to those with gingivitis. There were significant association between OHRQOL and underlying diabetes mellitus, self-perceived oral health status and self-perceived oral health satisfaction with p value  $< 0.05$ . This shows that those with underlying diabetes mellitus have higher S-OHIP score indicated poorer OHRQOL. Meanwhile, those who perceived they have either good or very good oral hygiene and satisfied with their oral health have lower S-OHIP score indicated better OHRQOL.

This study found that periodontal diseases have significant association with the OHRQOL. Therefore, reinforcement of oral health education by the dentists is crucial.

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### Introduction

Literatures found that people with significant periodontal disease have poorer oral health related quality of life in comparison with those who had healthier periodontal status<sup>1</sup>. Less attention is received on the impact of periodontal disease on quality of life in comparison with other common oral conditions occasionally.

Periodontitis is defined as inflammation of the gingiva and periodontal membrane can cause loss of supporting connective tissue and alveolar bone. In advanced stages, it can result in loosening of teeth, impaired oral function and eventual loss of teeth. Periodontal disease had been found to be associated with altered systemic health conditions, such as cardiovascular disease, respiratory diseases, and diabetes<sup>2</sup>.

It was a big concern as the prevalence of periodontitis affects >90% of the world population and is the most common chronic inflammatory disease of human<sup>3</sup>. The prevalence of periodontitis in Malaysia has been reported 94% and 18.2% had severe form of periodontitis in 2010<sup>4</sup>.

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Traditionally, the outcome indicators in periodontal therapy is more toward the therapist-centered<sup>5</sup>. The ability to generalize findings to wider populations can be constrained. Such restriction can be considered as one of the limitations. Better planning and evaluation of periodontal care and treatments adequately address patients' needs and concerns can be designed from a better understanding of the consequences of periodontal disease and its treatment on patients' perceptions of how their oral health affects their daily lives<sup>6</sup>. Locker (2004) further enhanced that the access to oral health care can be improved from the use of this information to demonstrate the burden of periodontal disease on the well-being of populations and to advocate for resources<sup>7</sup>.

The population studies have gained the popularity recently. The finding showed patient with periodontitis alone has poor oral health-related quality of life, even after excluded any other factors as such demographic factors, socioeconomic position and other common oral conditions<sup>8</sup>. Oral health impact factor (OHIP) is the most common used in the previous literature to measure the adverse impact of oral condition on daily basis. The Original OHIP includes 49 items grouped into seven domains; namely functional limitation, physical pain, psychological discomfort, physical disability, psychological disability, social disability and handicap<sup>9</sup>.

There was lack of studies to investigate the impact of periodontal disease on the quality of life using OHIP-14 in Malaysia. The Malay version of L-OHIP(M) is used to assess the impact of oral health on patients' quality of life<sup>10</sup>. Later on, Short version of OHIP(S-OHIP) was developed and found to be valid, reliable and appropriate for the use in the cross-sectional studies in Malaysian adult populations<sup>11</sup>. The aims of this study were to evaluate the oral health related quality of life and its determinant factors among patients attending periodontal clinic in IIUM Kuantan.

## Materials and methods

### Population and setting

This cross-sectional study was carried out in Periodontal Specialist Clinic at International Islamic University of Malaysia over 6 months. The inclusion criteria were adults between 20 to 65 years old, who can understand Malay or

English and had been diagnosed with healthy gums or gingivitis or periodontitis who came for treatments at dental specialist clinic during the period of the study. The exclusion criteria was adults with combination of perio-endo lesions. A total of 100 patients were recruited for this study using purposive sampling.

### Sample size calculation

Sample size was calculated using Yamane sampling size for finite population. The formula used was  $(n = N / (1 + N (e)^2))$ , where 'n' was the sample size, 'N' was the population size and 'e' was the acceptable sampling error. Therefore, with 95% confidence interval, a total of 100 samples were required in this study.

### Data collection and instrument

After written consent was obtained, participants were asked to answer the validated, self-administered questionnaire. This was done using the validated short version of Oral Health Impact Profile Malay version(S-OHIP(M))<sup>11</sup>. This questionnaire consists of 7 domains with two questions for each domain total of 14 questions). The response options for the S-OHIP are based on the experience of the respondents for the past one year. The questionnaire used 5 point Likert scale of 0(never), (1) hardly ever, (2)occasional, (3)often and (4)very often for each questions. The total score was computed by summing the scores across the 14 questions which ranges from 0 to 56. The higher score reflects poorer ORHQOL. This questionnaire has shown high consistency and reliability<sup>11</sup>.

Periodontal examination was conducted by a single clinical examination was done by a single periodontist to avoid inter-examiner biased. The participants were categorized into 2 groups based on their diagnosis: Periodontitis and Gingivitis. Each of them underwent a comprehensive periodontal examination as their routine assessment. The examination included assessments of medical, social and dental factors as well as periodontal measures such as probing depth, attachment levels, furcation involvement, tooth mobility, plaque and bleeding on probing. For the study, basic periodontal information was extracted from the assessment including number of teeth with periodontal pockets equal to or exceeding 5 mm, number of teeth present, tooth mobility and others.

### Statistical analysis

The data was analysed using Statistical

Package for Social Sciences (SPSS) version 25.0. The categorical data were reported as descriptive statistics using frequencies and percentages. Test of normality was performed for continuous data. The normally distributed data were reported using mean and standard deviation (SD) while the not normally distributed data were reported using median and interquartile range (IQR). Association between normally distributed data and categorical data was analyzed using independent t-test. Association between the normally distributed data and not normally distributed data was performed using Spearman correlation coefficient test. Association considered significant at value of  $p < 0.05$ .

### Ethics

This study was approved by the International Islamic University Malaysia Research Ethic Committee (IREC 2018-079) on 03<sup>th</sup> October 2017 prior to commencement of the study.

### Results

Table 1 shows the sociodemographic characteristics of the participants. One hundred participants completed the study as shown in the table. The median age was 30 years old. Majority of them were non-smoker. Half of the participants have clinical periodontitis (chronic and aggressive).

Variables	n(%) or median(IQR)
<b>Gender</b>	
Female	61(61.0)
Male	39(39.0)
<b>Median age in years (IQR)</b>	30(29)
<b>Range</b>	(19-72)
<b>Race</b>	
Malay	91(91.0)
Others	9(9.0)
<b>Educational level</b>	
Primary school and lower	5(5.1)
Secondary school	30(30.6)
University	63(64.3)
<b>Smoking status</b>	
Yes	10(10.0)
No	88(88.0)
Ex-smoker	2(2.0)
<b>Underlying medical problem</b>	
<b>Hypertension</b>	
Yes	3(3.0)
No	97(97.0)
<b>Diabetes mellitus</b>	
Yes	5(5.0)
No	95(95.0)
<b>Clinical diagnosis</b>	
Chronic periodontitis	49(49.0)
Aggressive periodontitis	1(1.0)
Gingivitis (no periodontitis)	50(50.0)

**Table 1.** Sociodemographic characteristics of the participants.

Variable	n(%)
<b>Perceived oral health status</b>	
Very good	6(6.0)
Good	25(25.0)
Fair	59(59.0)
Poor	10(10.0)
<b>Perceived dental treatment needs</b>	
Yes	93(93.0)
No	7(7.0)
<b>Perceived oral health satisfaction</b>	
Satisfied	45(45.0)
Not satisfied	55(55.0)

**Table 2.** Self-perceived oral health status among participants.

S-OHIP(M) domain and item	Prevalence (%)			Mean ± SD
	Occasional	Often	Very often	
<b>Functional limitation</b>				
Difficulty chewing any foods	26(26.3)	8(8.1)	3(3.0)	1.22± 1.31
Problems caused bad breath	28(28.3)	16(16.2)	1(1.0)	1.57± 1.42
<b>Physical pain</b>				
Discomfort eating any food	23(23.2)	14(14.1)	4(4.0)	1.31± 1.31
Ulcers in mouth	26(26.3)	2(2.0)	0(0.0)	1.12± 0.91
<b>Psychological discomfort</b>				
Discomfort due to food getting stuck	35(35.7)	31(31.6)	6(6.1)	2.10± 1.02
Felt shy	29(29.3)	13(13.1)	3(3.0)	1.25± 1.20
<b>Physical disability</b>				
Avoided eating certain foods	21(21.4)	13(13.3)	2(2.0)	1.07± 1.20
Avoided smiling	6(6.1)	4(4.1)	1(1.0)	0.86± 1.29
<b>Psychological disability</b>				
Sleep been disturbed	15(15.3)	5(5.1)	0(0.0)	0.84± 1.30
Concentration been disturbed	19(19.4)	7(7.1)	0(0.0)	0.99± 1.21
<b>Social disability</b>				
Avoided going out	8(8.2)	0(0.0)	0(0.0)	0.20± 0.57
Problems in carrying out daily activities	11(11.1)	1(1.0)	1(1.0)	0.52± 0.98
<b>Handicap</b>				
Had to spend a lot of money	13(13.1)	1(1.0)	1(1.0)	0.68± 1.13
Felt less confident	15(15.2)	7(7.1)	1(1.0)	0.82± 1.15
<b>Total S-OHIP score</b>				Mean: 14.73 ± 9.24

**Table 3.** Short Oral Health Impact Profile Malay version (S-OHIP (M)) score of the participants.

Table 2 shows majority of the participants (59%) perceived that they have fair oral health with 93% perceived they need for dental treatments. More than half of the participants (55%) were not satisfied with their current oral health.

The total mean S-OHIP score is 14.73 ± 9.24 as shown in table 3. The most affected domain is psychological discomfort in which 6.1% reported very often to have discomfort due to food getting stuck.

Table 4 shows factors associated with OHRQOL of the participants. There is significant association between OHRQOL with underlying diabetes mellitus, clinical diagnosis of periodontitis, perceived oral health status as well as perceived oral health satisfaction. Those who have underlying diabetes mellitus have higher S-OHIP score which indicates poorer OHRQOL.

Table 4 also shows that those who have periodontitis have poorer OHRQOL compared to those with gingivitis (no periodontitis). It is also indicates that those who perceived their oral health as poor has the poorest OHRQOL with the highest S-OHIP score. Finally, those who perceived they are not satisfied with their oral health have higher S-OHIP score thus indicates poorer OHRQOL compared to those who are satisfied.

Variables	S-OHIP score(mean±SD)	P value
<b>Gender</b>		
Female	14.26 ± 9.88	0.69
Male	15.03 ± 8.89	
<b>Age</b>	r = 0.19	0.051
<b>Race</b>		
Malay	15.00 ± 9.20	0.34
Others	11.75 ± 9.81	
<b>Educational level</b>		
Primary school and lower	15.40 ± 6.19	0.13
Secondary school	17.64 ± 9.61	
University	13.39 ± 9.22	
<b>Smoking status</b>		
Yes	13.00 ± 9.55	0.64
No / ex smoker	14.85 ± 9.27	
<b>Underlying medical problem</b>		
<b>Hypertension</b>		
Yes	13.50 ± 2.12	0.85
No	14.76 ± 9.34	
<b>Diabetes mellitus</b>		
Yes	23.40 ± 9.56	0.03*
No	14.26 ± 9.04	
<b>Clinical diagnosis</b>		
Periodontitis	17.78 ± 9.75	0.001*
Gingivitis	11.88 ± 7.93	
<b>Perceived oral health status</b>		
Very good	6.83 ± 7.49	0.02*
Good	12.75 ± 7.97	
Fair	15.42 ± 9.57	
Poor	20.30 ± 7.62	
<b>Perceived dental treatment needs</b>		
Yes	15.01 ± 9.10	0.29
No	11.14 ± 11.04	
<b>Perceived oral health satisfaction</b>		
Satisfied	12.05 ± 8.85	0.01
Not satisfied	16.87 ± 9.06	

**Table 4.** Factors associated with OHRQOL of the participants.

## Discussion

### OHRQOL and periodontal disease

Oral conditions like periodontal disease, caries and others may impair the individual's health and quality of life. There were growing demands recently in the use of patient-centered oral health status measure as a means of capturing non-clinical aspects of oral health in descriptive population-based research. Therefore, the understanding the implications of this from patient's perspective has emerged as a central research area<sup>12</sup>. The findings of this study demonstrated those who have periodontitis have poorer OHRQOL compared to those who only have gingivitis in which in accordance to previous research<sup>1,13</sup>.

It is also indicates high impacts on psychological discomfort and physical pain which is in agreement with a previous worldwide studies<sup>14, 15, 16</sup>. The item that has major impact was food getting stuck especially among the participants who were diagnosed with periodontitis. The implications of chronic periodontitis can result in receding gum and drifted tooth. Hence, food can be easily get stuck in between teeth, thereby affecting the quality of life, nutrition and self-esteem<sup>17</sup>.

### OHRQOL and sociodemographic profile

Several studies have concerned the impact caused by sociodemographic parameters such as age, gender and social class on OHRQOL which are considered as culture-sensitive<sup>18, 19</sup>. The present research demonstrated educational level, gender and age were not associated with OHRQOL among Malays. The finding was in agreement by local study by a selected population in Kuala Lumpur<sup>20</sup>. In contrast, several studies observed the positive correlation between OHRQOL with gender<sup>21, 22, 23</sup>, age<sup>16</sup>, and educational level<sup>1</sup>. Interestingly, the earlier works found the difference patterns of age level associated with OHRQOL. For example, studies by McGrath and Bedi (2002) observed that OHRQOL tended to decrease with age and in increasing pattern with age as observed by a study done in Brazil<sup>24</sup>. The differences may indicate distinct differences in the way oral health is perceived upon quality of life at different stages in life and it may have implications for the effectiveness of public health interventions and health promotion<sup>22, 24</sup>. In our finding, we failed to show these differences and this may be due to the small sample and was confined to those who attended periodontal specialist dental clinic.

### Periodontitis and diabetes

Studies showed there was strong correlation between diabetes and periodontitis<sup>3, 25-27</sup>. The data from the epidemiological studies also indicated clearly that diabetes increases the extent and severity of periodontitis<sup>28</sup>. The mechanism of the link between these two conditions involved the immunology, cytokine biology and neutrophils activity in the affected person<sup>3</sup>. In current findings, there was a significant association between participants' OHRQOL and diabetes mellitus with gingivitis or periodontitis. This finding is contradicted with the

study done in Newcastle, UK.<sup>29</sup> This may be related to the chronic disease (diabetes) states have a significant impact on individual, as consequence, led the less priority for oral health particularly if the benefits of attaining oral health are perceived to be minimal<sup>30</sup>. Both of the current study and a latter work by Irani et al(2015) has limited the number of participants with diabetes and may result the inconclusiveness of the finding<sup>31</sup>. Thus, further research with an adequately powered sample size may be able to capture this difference is warranted.

### OHRQOL and self-perceived oral health satisfaction

The earlier work had shown that self-perceived oral health had been associated with self-reported indicators of oral health<sup>32</sup>. OHRQOL were found to be significantly associated with participants' self-perceived oral health status and self-perceived oral health satisfaction in this study. We found that individuals who perceived their oral health status as poor and do not satisfied with their oral health has poorer OHRQOL. This finding corroborate with a study by Palma (2013)<sup>33</sup>. It is good to understand the components of overall oral health perception in order for us to move closer with oral health behaviours and oral-health-related quality of life.<sup>32</sup>

### Limitation

The present study exhibits several limitations, such as the small sample population recruitment using a convenience group, which may result in selection bias since the participants were self-selected to those who are attending the specialist clinic. This may not allow us to make inferences based on the sample data and outcome. The cross-sectional nature of the present study restricted the ability to make causal inferences, although the results were consistent with other similar studies. A larger sample size on OHRQOL of patient diagnosed with periodontal disease is warranted, possibly with proper control of confounding factors to avoid misinterpreting the data and the apparent strength of associations.

### Conclusions

This study found that periodontal diseases have significant association with the

OHRQOL and thus demands attention from the health authorities. Identification of these problems should be useful for strategic planning to address the impact of periodontal disease towards one's quality of life as well as promoting oral health and awareness for achieving better control of the disease. We also recommend that oral health professionals assume more active roles in promoting oral health education in line with the clinical management.

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All authors have made substantive contribution to this study and all have reviewed the final manuscript prior to its submission.

### Declaration of Interest

There is no conflict of interest. This study is funded by Research Initiative Grants Scheme (RIGS17-088-0663). Ethical Approval from our institution was obtained prior to commencement of the study (IREC 079).

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