

# Assessment of knowledge and awareness of oral health and periodontal diseases: A cross-sectional study

*By Huda Jassem Jebur*

6

## Assessment of knowledge and awareness of oral health and periodontal diseases: A cross-sectional study

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## ABSTRACT

**Background:** The World Health Organization's campaign "Oral Health for a Healthier Life" emphasizes the importance of the oral cavity as a portal to the body, which reflects overall health. On the other hand, periodontal diseases are a category of illnesses caused by inflammation of the periodontal attachment apparatus that surround and support the teeth. To date, epidemiological studies to assess oral health and periodontal disease awareness in AL-Basrah governorate generally and patients of AL-Basrah Dental college specifically are generally lacking. Therefore, epidemiological study to assess awareness being urgently needed.

**Aims:** Determine oral health and periodontal disease awareness among the patients attending College of Dentistry/University of Basrah.

**Methods:** This study was a questionnaire-based survey on the patients attending the Basrah Dental College. The questionnaire consisted of a demographic data section and two other main sections for the evaluation of oral health and periodontal disease awareness. Each response was marked with "1" for a positive answer and "0" for the other answers. For each respondent, answers were summed up to give an overall score. The frequency of positive responses was used to determine the association of awareness levels (low, moderate, and high) with demographic data, age, gender, and place of residency.

**Results:** A total of 200 patients (54% males and 46% females) were involved in the survey. The degree of awareness is moderate in the majority of the enrolled participants (85.0%). There is no significant association between the level of awareness and the age group (P value > 0.05) but there is a slightly better level of knowledge among those between 30 and 45 years of age. Regarding the relation between gender and awareness, the results showed there is no significant association between gender and degree of awareness (P value > 0.05). Also, there is no significant overall difference between residency and level of awareness (P value > 0.05), but better achievement is noticed among candidates from Al-Zubair discrete, followed by the center of Basrah governorate.

**Conclusion:** A significant proportion of the participants heard about oral health and periodontal diseases from non-dental clinic sources. They existed non-sufficient awareness of the etiology, age, gender predispositions, manifestation, complications, and the preventable nature of periodontal disease. However, the majority of them showed an interest in learning about oral health measures and periodontal diseases, which should be utilized in optimizing their knowledge and prevention of future oral diseases.

**Key words:** Oral health, Periodontal diseases, Teaching clinics, College of Dentistry, University of Basrah

## Introduction

Regardless of physical or societal inequalities, everyone wants to live a healthy life. Oral health (OH) is a crucial component and prerequisite for achieving and maintaining general health [1]. The absence of symptoms and signs of gingival inflammation indicates good periodontal health. Contrarily, periodontal diseases (PDs) are among the most prevalent oral illnesses in the general population and are second only to dental caries in terms of prevalence worldwide [2].

<sup>46</sup> Periodontal disease (PD) is a multifactorial disease which is inflammatory in nature. If not disturbed, plaque biofilm starts the process. The long-term effects will be the gradual retraction of the gingiva and the development of periodontal pockets (proximally). It's probable that the loss of attachment at nearby sites alters the nature of the biofilm at those locations, favoring the prevalence of anaerobic bacteria. It is linked to pathogenic microbes including Porphyromonas gingivalis and Aggregatibacter actinomycetemcomitans, both regressive and chronic periodontitis have these microorganisms [3].

The most frequent effects of untreated PD include bone resorption, tooth mobility, and tooth loss. The PDs may be causing scenarios for the teeth's surrounding, supporting components to become more problematic. Additionally, these PD-related effects may potentially go beyond this [4]. The research has highlighted the negative effects of untreated PDs and the reciprocal association between PDs and systemic disorders in numerous ways, <sup>51</sup> including diabetes mellitus, cardiovascular disease, hypertension, osteoporosis, and unfavorable pregnancy outcomes [5].

The main components of PD prevention and treatment include <sup>28</sup> professional cleaning, effective plaque control, and adjustment of negative risk factors. By offering patients with the necessary oral care and motivating them to alter their behavior and attitude toward OH, dentists play a crucial role in this regard [6].

Children, adolescents, and adults, as well as patients who attend a college of dentistry, can all benefit from the OH's knowledge of PDs in terms of both treating and preventing the condition [7,8].

<sup>3</sup> The present study is the first study of its kind in Al-Basrah governorate. <sup>3</sup> In AL-Basrah governorate there is no previous epidemiological data pertaining to OH and PD awareness of AL-Basrah governorate generally and patients of AL-Basrah Dental college particularly. <sup>5</sup> For the above-mentioned reason, <sup>3</sup> it was decided to carry out a survey among sample of patients of AL-Basrah Dental college to determine the oral and periodontal health awareness. So, this study will provide <sup>7</sup> a picture of public health requirements in periodontal field, which is essential for national OH policy-making and specific interventions.

## Methods

### Study design

<sup>5</sup> An observational cross-sectional study was designed in the Department of Periodontology College of Dentistry, University of Basrah to assess <sup>2</sup> OH and PD awareness and knowledge among patients attending teaching clinics of Basrah Dental College in Basrah Governorate/Iraq.

### Study Settings

35 The study was conducted in the educational clinics of the College of Dentistry, University of Basrah, where it is among the international universities according to the British (QS) classification, rank 1201 in 2021, and it became an independent academic institution in 1964. 38 The College of Dentistry, University of Basrah, ranked fifth in the Arab world according to the Times classification, which included 1,406 institutions from 106 countries around the world. College of Dentistry, University of Basrah is located in the center of Basrah in the Al- Baradiya area, ranking the seventh among dental colleges according to the Iraqi classification of universities (IRU) in 2021. The educational clinics are located within the college campus and are considered a vital and effective part for the teaching staff and students, as well as they contribute effectively to improving and developing the scientific and practical side for both parties.

### Objectives:

Primary objectives: Assess oral health and Periodontal disease awareness by a survey which include a structured close-ended (multiple choice questions) questionnaire.

Secondary objectives: In order to assess the association between the age of candidates, gender, and place of residence with the level of awareness and knowledge in regard to oral health and periodontal diseases. 17

### Source of Data

Data collection started by using a special patient information sheet and consent form (appendix 1), then it was followed by a survey which included a structured close-ended (multiple choice questions) questionnaire which was used to record the demographics data like age, gender, as well as 30 different questions about OH and PD awareness. Data have been varied and takes different forms of variables and related questions; type, duration of brushing, using of interdental aids (dental floss, tooth pick and interdental brush), if patients suffer from oral halitosis, bleeding during brushing, bad habits like smoking, if they had past visits for dental clinic for seeking various forms of periodontal treatment.

### The study population

The study complex in this research consists of patients visiting educational clinics at the University of Basrah, College of Dentistry. The study was conducted on 200 patients between the ages of 18-60 years from approximately different social, economic, and living backgrounds without being restricted to a specific group of people.

### 44 Inclusion and Exclusion criteria

#### Inclusion criteria

1. Patients visiting educational clinics at the University of Basrah, College of Dentistry.
2. Patients with age range between 18-60 years old.

#### 30 Exclusion criteria

1. Patients not willing to participate in the study
2. Patients above 18 years

### 3. Patients below 60 years

#### Materials

No tool was used because nature of the study does not depend on clinical periodontal examination, but it was a survey dependent study regarding awareness of OH and PD. A data sheet containing closed-ended questions for which the answers are **dichotomous (yes and no) or multiple-choice questions**.

Before commencing **the** data collection process, approval was obtained from **a local ethics committee in Department of Periodontal, College of Dentistry, University of Basrah**.

More than 200 data sheets of A4 were printed. Each sheet contained 30 questions in English language in relation to the research topic. The sheets were divided among 6 participating students, at a rate of 35 sheets per student, and the students in turn choosing a group of patients randomly from the waiting halls at the teaching clinics in College of Dentistry, with participating ages of 18-60 years in different living strata of society and areas of residence, then each patient was asked individually in an easy and very clear way that ensures that the information reaches the participants smoothly to take the accurate answer by the students.

#### Data recording and duration

All questionnaire data was recorded by the participating students, and this was done by **comprehensively explaining and simplifying the questions to the study participants**. The data was collected **over a period of months from November 2021 to February 2022**.

#### Design of the questionnaire and score calculation

A specially organized questionnaire (appendix 2) was prepared by the participating students, which was checked and corrected by the researcher supervisor. It contains a variety of questions. All the questions were explained individually in Arabic for a better understanding. For use in the present study, it was modified before being translated into Arabic. Age, gender, occupation, address, and phone number were all included in the section of the survey devoted to demographic information

Evaluation of awareness and knowledge among patients was conducted using 30 questions that concerned with OH and PD awareness, distributed as **two main sections; the first one (from question # 1 to #17) was dedicated for evaluating OH awareness whereas the second part (from question #18 to # 30) was designed to evaluate PD awareness**. The responses to the questions about periodontal knowledge were scored as true (score 1) and false (score 0), and a sum score derived from 30 questions (range: 0-30) was calculated for each participant. Each individual response was marked in the box chart that designed to write the answers of each participant (Figure 1).

Answers were summed to give an overall score for the two sections of the questionnaire. The correlation between various demographic factors, including age, gender, and location of residence, was ascertained using the frequency of the affirmative responses to each question. According to how many participants gave affirmative answers in each question, the level of awareness was divided into categories for each participant into **low (0-10), moderate (11-20), and high (21-30)**.

No	Choice	No	Choice	No	Choice
1		11		21	
2		12		22	
3		13		23	
4		14		24	
5		15		25	
6		16		26	
7		17		27	
8		18		28	
9		19		29	
10		20		30	

**Figure (1) : Box chart for data recording**

### Statistical analysis

Data were feed on SPSS (Statistical Package for Social Science) statistics for windows, version 23(IBM. Corp., Armonk, N.Y., USA). Data were checked and analyzed for univariate and multivariate analysis. Two types of tables were used frequency descriptive, and cross tabulation comparative. For significance detection, Pearson chi-square (X) test was used for qualitative data. A P-value (P value) of <0.05 was considered statistically significant(S), while P <0.001 and P >0.05 were considered statistically highly significant (HS) and non-significant (NS) respectively.

### Results

#### The sociodemographic characteristics of the enrolled candidates

A total of 200 people were involved in the survey. Their sociodemographic characteristics are represented in Table (1), which shows the mean patient age is 36.41 years, and the gender distribution shows that 54% of them were males and 46% were females. Regarding the geographical distribution, 40% of the cases lived in the center of the Basrah governorate, while 60% were distributed in different Basrah districts.

**Table (1): The sociodemographic characteristics of the enrolled candidates**

Mean Age	36.41 years		
		No.	%
Gender	Male	108	54
	Females	92	46
Residency	Basrah	80	40
	Abo-Alkasib	46	23
	Shat-Alarab	36	18
	Al-Zubair	38	19

#### Number of dentist's visits and the persons' knowledge of the reasons for malodour and Dental Staining

Regarding the details of each question in the survey, the results showed that the majority of the patients (54%) never visit the dentist at all and only 9 percent of them visit the dentist every 3 months. Furthermore, the most common reason for malodour is poor oral hygiene, which is reported at 56.5%. Moreover, about half of the patients (52.5%) think that PD can affect their general health. Additionally, the majority of the patients (83.5 %) think that their coffee or tea drinking is the cause of their Dental Staining. Table (2) below represents the details of the above-mentioned information.

**Table (2) : Number of dentist's visits and the persons' knowledge of the reasons for malodour and Dental Staining**

Items	Options	No.	%
Number of visits to the dentists for scaling	Every 3 months	18	9
	Every 6 months	32	16
	Once a year	42	21
	Never visiting dentists	108	54
Do you visit the dentist for treatment?	Yes	148	74
	No	52	26
Reason for malodor	Smoking	30	15
	Poor oral hygiene	113	56.5
	Type of Food	21	10.5
	Don't know	36	18
Does periodontal disease affect the general health?	Yes	115	52.5
	No	57	28.5
	Maybe	29	14.5
	Don't Know	9	4.5
Does Coffee or tea is a reason for teeth staining?	Yes	167	83.5
	No	20	10
	Maybe	13	6.5

### The information related to teeth brushing

On the other hand, about half of patients (51.5%) brush their teeth twice a day and only 9.0% of them never brush their teeth at all daily. Regarding the time spent on tooth brushing, it is approximately equally distributed between 1 minute (37.5%) and more than one minute (34.0%). Fortunately, most people (53%) brush their teeth after every meal. Regarding the brushing techniques, a higher percentage of the patients (33.5%) believe that vertical strokes are the best technique for OH. Table (3) below clarifies the details of the above-mentioned information.

**Table (3): The information related to teeth brushing**



Items	Options	No.	%
39 Frequency of teeth brushing	Once a day	79	39.5
	Twice a day	103	51.5
	Never	18	9
Time of teeth brushing	< 1 minute	57	28.5
	1 minute	75	37.5 %
	2 – 3 minutes	68	34
Duration for changing teeth brush	Every 3 months	147	73.5
	Every 6 months	53	26.5
Does you brush your teeth after every meal?	Yes	106	53
	No	94	47
Frequency of participants using mouth wash	Not use	96	48.5
	Irregular use	23	11.5
	On dentist prescription	81	40.5
Is toothbrush useless in gingivitis prevention?	Yes	129	64.5
	No	71	35.5
Type of toothbrush bristles	Soft	124	62
	Hard	58	29
	Don't know	18	9
Time for toothbrush	Morning	53	26.5
	Mid-day	22	11
	Before sleep	125	62.5
Brushing technique better for oral health	Horizontal stroke	53	26.5
	Vertical stroke	67	33.5
	Stroke roll	43	21.5
	Not aware	37	18.5

#### The information related to gingival bleeding, bad breathing, and gingivitis

Regarding the candidate's knowledge of gingival bleeding, (62%) of the people think that the cause is poor oral hygiene. Furthermore, 68% of patients think that the mouth is not the only source for bad breath, and the same percentage (68%) think that scaling and polishing will reduce gingivitis. Table (4) below clarifies the details of the above-mentioned information.

**Table (4): The information related to gingival bleeding, bad breathing, and gingivitis**

Items	Options	No.	%
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<b>Reasons for gingival bleeding</b>	<b>Vitamin C deficiency</b>	<b>35</b>	<b>17.5</b>
	<b>Poor oral hygiene</b>	<b>124</b>	<b>62</b>
	<b>Don't know</b>	<b>41</b>	<b>20.5</b>
<b>Gingival bleeding during brushing</b>	<b>Yes</b>	<b>93</b>	<b>46.5</b>
	<b>No</b>	<b>91</b>	<b>45.5</b>
	<b>Don't know</b>	<b>16</b>	<b>8</b>
<b>Does gingival swelling occur during pregnancy?</b>	<b>Yes</b>	<b>59</b>	<b>29.5</b>
	<b>No</b>	<b>76</b>	<b>38</b>
	<b>Don't Know</b>	<b>65</b>	<b>32.5</b>
<b>Does the mouth is the only source for bad breath?</b>	<b>Yes</b>	<b>64</b>	<b>32</b>
	<b>NO</b>	<b>136</b>	<b>68</b>
<b>Does scaling and polishing reduce gingivitis?</b>	<b>Yes</b>	<b>136</b>	<b>68</b>
	<b>NO</b>	<b>64</b>	<b>32</b>

**The information related to maternal dental health and basic knowledge of the patients about factors affecting dental disease**

In terms of the relationship between pregnancy in the presence of dental disease and its relationship with low birth weight, 57.05% of people agree that the two variables are related. 55.0% of the candidates believe that the mother's oral hygiene can affect their children's OH status. Noticeably, most of the participants (83.5%) blame sweets as a cause for poor dental health. Also, the majority of candidates (56.0%) think that dental disease is increasing with age. Additionally, around 39% of the cases suggest that PD is the major cause of tooth mobility. Table (5) clarifies the above-mentioned information with a detailed description.

**Table (5): The information related to maternal dental health and basic knowledge of the patients about factors affecting dental disease**

<b>Items</b>	<b>Options</b>	<b>No.</b>	<b>%</b>
<b>Does pregnant women with periodontal disease gave higher risk for low birth weight ?</b>	<b>Agree</b>	<b>115</b>	<b>57.5</b>
	<b>Disagree</b>	<b>85</b>	<b>42.4</b>
<b>Does mother's oral health influence children oral health?</b>	<b>Yes</b>	<b>110</b>	<b>55</b>
	<b>No</b>	<b>90</b>	<b>45</b>
<b>Do sweets affect dental health?</b>	<b>Yes</b>	<b>167</b>	<b>83.5</b>
	<b>No</b>	<b>33</b>	<b>16.5</b>
<b>Does the prevalence of periodontal disease increase after age 35?</b>	<b>Yes</b>	<b>112</b>	<b>56</b>
	<b>No</b>	<b>30</b>	<b>15</b>
	<b>Maybe</b>	<b>58</b>	<b>29</b>
<b>Causes of tooth mobility</b>	<b>Diabetes Mellitus</b>	<b>30</b>	<b>15</b>

	<b>Trauma</b>	<b>30</b>	<b>15</b>
	<b>Aging</b>	<b>62</b>	<b>31</b>
	<b>Periodontal disease</b>	<b>78</b>	<b>39</b>

### The information related to causes of certain periodontal disorders

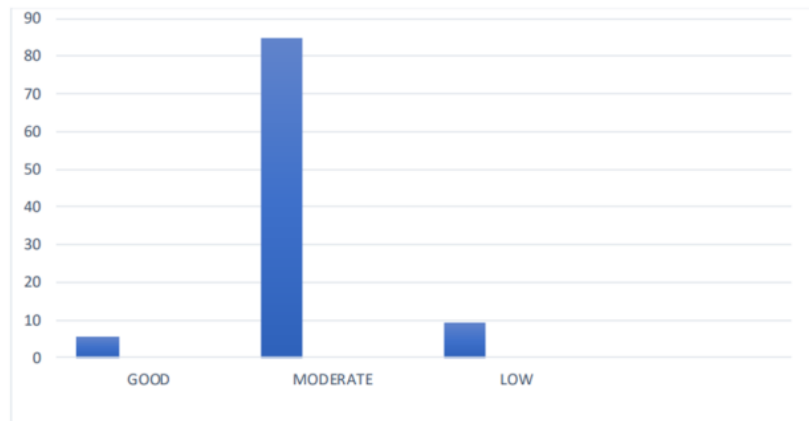
Subsequently, most people (42.05%) think that tooth dislocation is the major cause of plaque formation. In addition, 53% of patients are completely unaware of the use of interdental aids. Moreover, about half of the patients (47.05%) think that hot or cold food sensitivity is a treatable condition. On the other hand, 61.5% of the patients think that improper tooth brushing is the most common cause of receding gums. Around 40% of the enrolled candidates think that periodontitis is a treatable disease. Additionally, 64% of the participants think that PD has a genetic link. Table (6) below clarifies the above-mentioned information with a detailed description.

**Table (6) : The information related to causes of certain periodontal disorders**

Items	Options	No.	%
Consequences of plaque formation	Teeth malformation	41	20.5
	Teeth dislocation	85	42.5
	Gum disease	74	37
The use of interdental aid	Sometimes	53	26.5
	Frequent use	41	20.5
	Not aware of it	106	53
Do you think the hot or cold food sensitivity is treatable?	Yes	95	47.5
	No	50	25
	May be	33	16.5
	Not aware	22	11
Is periodontitis treatable disease?	Yes	85	42.5
	No	115	57.5
What is the commonest cause for receding gums?	Improper tooth brushing	123	61.5
	Nail biting habit	45	22.5
	Diabetes	32	16
Do you think genetic play a role in periodontal disease?	Yes	128	64
	No	72	36

### The overall score of candidate awareness about periodontal diseases

The overall scoring of the knowledge of people attending the dental teaching clinics about OH and PDs is summarized in Figure (2), which shows that the degree of awareness is moderate in the majority of the enrolled participants (85.0%), while only 5.5% and 9.5% of the candidates get an overall score of good and low, respectively. Subsequently, 14.98 is the average score.



**Figure (2): The overall score of candidate awareness about periodontal diseases**

29

### The association between age and degree of awareness

In order to assess the association between the age of candidates, gender, and place of residence with the degree of awareness and knowledge in regard to OH and PDs, Table 3.7 represents the relationship between age groups and the degree of awareness, which shows that there is no significant association between the level of awareness and the age group ( $P$  value  $> 0.05$ ) as the moderate level of knowledge is the predominant one among all ages, but there is a slightly better level of knowledge among those between 30 and 45 years of age.

**Table (7): The association between age and degree of awareness**

Age Groups	Degree of awareness			Total	P value
	Low	Moderate	Good		
Less than 30 years	10 (11.4 %)	74 (84.1 %)	4 (4.5 %)	88	0.452
30 – 45 years	3 (4.4 %)	60 (88.2 %)	5 (7.4 %)	68	
More than 45 years	6 (13.6 %)	36 (81.8 %)	2 (4.5 %)	44	
Total	19	170	11	200	

### The association between gender and degree of awareness

Subsequently, the association between the level of awareness and gender is also assessed. Table (8) below represents this association, which showed that there is no significant association between gender and degree of awareness (P value > 0.05) as the moderate level is still the predominant level of awareness in both males and females, but a slightly higher percentage is noticed among males, in contrast to the good level, which reveals a higher level of performance among females.

**Table (8) : The association between gender and degree of awareness**

Gender	Degree of awareness			Total	P value
	Low	Moderate	Good		
Female	6 (6.5 %)	78 (84.8 %)	8 (8.7 %)	92	0.089
Male	13 (12.0 %)	92 (85.2 %)	3 (2.8 %)	108	
Total	19	170	11	200	

#### The association between residency and degree of awareness

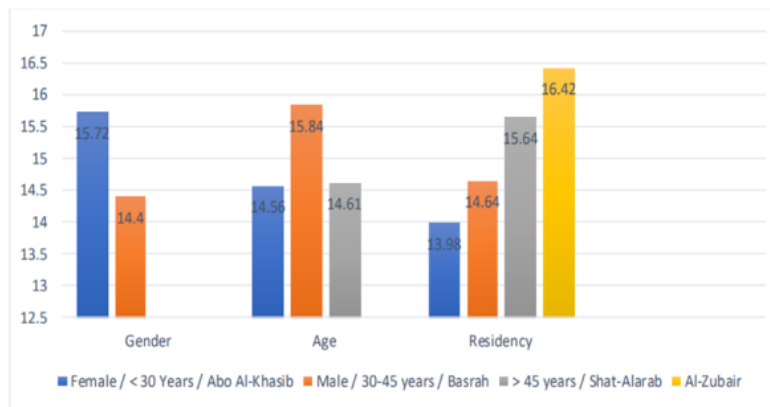
Regarding the place of residence and its association with level of awareness, Table (9) shows that there is no significant overall difference between the residency and level of awareness (P value > 0.05) but better achievement is noticed among candidates from Al- Zubair discrete, followed by the center of Basrah governorate, while the lowest level of knowledge is noticed among the people of Shat Al-Arab candidates.

**Table (9): The association between residency and degree of awareness**

Residency	Degree of awareness			Total	P value
	Low	Moderate	Good		
Abo-Alkasib	5 (10.9 %)	38 (82.6 %)	3 (6.5 %)	46	0.433
Basrah	10 (12.5 %)	68 (85.0 %)	2 (2.5 %)	80	
Shat Al-Arab	3 (8.3 %)	31 (68.1 %)	2 (5.6 %)	36	
Zubair	1 (2.6 %)	33 (86.8 %)	4 (10.5 %)	38	
Total	19	170	11	200	

#### The association between the overall score and age, gender, and residency

The mean of the overall score of knowledge about PD is represented in Figure (3) in relation to the age groups, gender, and place of residency. The bar chart shows a higher mean among females, those aged 30–45 years, and those living in the Al- Zubair district.



**Figure (3): The association between the overall score and age, gender and residency**

## Discussion

The PD is a significant public health issue that affects mastication, speech, esthetics, and quality of life in terms of OH. Public education and self-awareness of the disease through motivation, which are crucial in the prevention and management of the disease, are necessary for maintaining periodontal health.

Since most people are more likely to seek professional treatment for PD when they are aware of its existence, it has been claimed that raising broad public awareness of PD is strategically significant.

The OH knowledge is an integral attitude to preserve a healthy oral cavity. Various Studies have indicated that subjects acquire this knowledge from different sources such as media (e.g., newspapers, radio, and television), self-experience, school, parents, and even from friends or relatives [9].

The present study is the first study of its kind in Al-Basrah governorate, in which a group of patients were conveniently chosen from the teaching clinics of Basrah Dental College, where they have been asked different questions to estimate and evaluate their knowledge about the OH and PD awareness.

In this study, majority of patients reported moderate level of awareness and knowledge about general concepts related to OH and PDs, while minority are in low and good levels sequentially. In other studies, Abu-Gharbieh et al., reported that participants have suboptimal OH knowledge and behavior but acceptable level of knowledge on general concepts related to OH, such as flossing and brushing their teeth. One of the possible explanations to the lack of knowledge about oral, periodontal health and disease, they do not have the appropriate knowledge about the consequences and complications of dental health related-practices neglect (gingivitis, PD, dental caries, and tooth loss) [10].

The majority of study participants were brushing twice a day while the minority brushing their teeth once a day or never. Similar results found in study by Abu-Gharbieh et al. [10] which showed that brushing teeth was practiced by 22% of participants once daily and by 79% twice daily or more frequently. This also agreed with findings of Oberoi et al., [11] which found that 50% of study participants used toothbrush twice daily.

Another study by Jebur and Ahmed, [12] which is a cross-sectional study was conducted to assess the periodontal health status and treatment needs among undergraduate students of AL-Basrah colleges reported that the highest percentage of healthy periodontium was recorded among students who clean their teeth more than three times/day.

Universal studies showed that more plaque is removed when brushing time is increased from 1-4 minutes. However, even brushing for 4 minutes left the posterior teeth and lingual aspects of the teeth with higher plaque accumulation as compared to anterior teeth and buccal aspects. This underlines that not only brushing time but also brushing technique is important for maximum effectiveness [11]. The majority of study participants brushed their teeth for one minute, whereas the minority brushed for less than one minute. Another study Oberoi et al., [11] reported that most of the patients were brushing for 3-5 minutes. Regarding the brushing technique, vertical brushing technique was the most common technique utilized by the research patients, whereas stroke technique was employed by the fewest. Similar findings in study done in China Zhu et al., [13] report that the Chinese campaign has recommended certain methods of brushing the teeth, i.e., vertical technique, rolling or Bass-method, such methods were performed more frequently by urban participants whereas the horizontal brushing technique was common in rural areas. The findings of this study contradict those of Jain et al., [14] which found that the majority of patients brushed horizontally and just 10% employed the vertical technique.

The most prevalent time for brushing in this study was before sleeping and at morning sequentially. A study by (Taani, 2010) agreed with these findings, where the majority of study participants reported that they are brushing before going to bed. While most of patients in another study Zhu et al., [12] were brushing at the morning. According to the findings of this study, patients are aware of the significance of brushing before bed to maintain OH.

The quality of brushing can be affected by the type of toothbrush bristles used. Also, the selection of toothbrush depends on the patient's case and requirements. The majority of participants in this survey used soft toothbrushes, whereas others chose hard toothbrushes because they believe they are stronger. Controversial result was observed in study by Jain et al., [14], where only 10% of the subjects use soft toothbrush bristles. The majority of subjects in study by Zhu et al., [13] used soft-bristled toothbrushes, which is similar to the findings of the current study.

According to the Centers for Disease Control and Prevention (CDC), patients should replace their toothbrush every 3 - 4 months, because using it for a longer duration than the estimated period causes the bristles to fray and wear, making it less effective at plaque removal [14]. In the present study, most of the patients changed their toothbrush every 3 months, similar to the exact results that obtained through studies by Zhu et al., [13]; Oberoi et al., [11] which found that the majority of patients changed their toothbrush once in 3 months, while other study by Jain et al., [15] revealed most of their patients change their brush only when it is useless.

Mouthwashes in particular, which can be prescribed as adjunctive treatment when tooth brushing is inadequate in controlling the dental plaque, the greater number of study participants didn't use it, while the minority of the study participants use it only on dentist prescription. This could be because people believe

mouthwashes cause staining or other problems, as they hear from others who use it incorrectly and cause these issues, or because they are unaware of the importance of therapeutic mouthwash. Previous study by Al-Shammari et al., [16] showed a low percentage of patients used mouthwash according to the instructions provided by their dentist. Lowest number of patients in this study were using mouthwash irregularly similar to findings of Abdulkareem et al., [9] which showed that the majority of the patients were using mouthwashes without referring to their dentists.

Effective plaque control can't achieve with brushing only without interproximal cleaning with interdental cleaning aids (floss, toothpick, and interdental brush) [17]. A study by Graziani et al. [18] showed "adjunctive use of interdental brush or rubber interdental pick reduces more interdental plaque than brushing alone or flossing adjunctive to brushing". The use of interdental cleaning utensils can be considered an indicator of active knowledge of PD prevention. Further, we reported lower percentage of patients using interdental aids, while the majority of patients were not aware of this very important aid to keep a healthy periodontal tissue. Similar findings found by Abdulkareem et al., [9] which reported that the lowest response was associated with the use of interdental aids. Also, most of the subjects in study by El Din, 2015, [19] didn't use the floss on a daily basis, while in another study [20], flossing was reported by 64% of the patients. Reason for the above-mentioned result might be to the deficiency in resource allocation to health education programs that are carried out in Iraq. This emphasizes the urgent need for educating and motivating the public to use this efficient method for OH care [12].

Malodor is one of the most popular problems in Iraq and a lot of factors contributes to cause it such as smoking, type of food, poor oral hygiene, and systemic conditions. The highest percentage of study population report that poor oral hygiene is the most acceptable reason for malodor. Others, on the other hand, differed in their opinion between smoking and the type of food. Previous study done in Baghdad Abdulkareem et al., [9] showed 5 differences in study population responses relating to the main cause of malodor with high rate of awareness about causes of malodor. Bad breath has a very broad spectrum of causes. Generally, the causes can be divided into extra-oral and intra-oral ones. When we ask patients if the mouth is the only source for bad breath, "No" was the answer for the most of study participants, and this reflects the good awareness. While in another study, only 35 out of 661 students reported the correct answer about sources of bad breath [19].

When we ask patients if PDs affect the general health, the highest percentage of answers was "yes" and this reflect the awareness of them about the association between PDs and general health. Similar findings were in people studied in research of Hemalatha et al., [21] which revealed that the public had a general awareness about the link between PD and systemic health.

Stain has been defined as the discoloration of the tooth surface or surfaces as a result of ingested materials, bacterial action, tobacco and/or other substances. Which may be intrinsic, extrinsic, acquired, or developmental. Patients in this study had a good level of awareness regarding the causes of Dental Staining when they agreed that coffee and tea is a reason for Dental staining. In contrast to the findings of Khozeimeh et al., [22] who found that a high percentage of people believe that caries cause staining whereas a small percentage agree that extrinsic stains is the cause.



7

The prevalence of caries and PDs is directly related to a higher consumption of sweets [23]. In the present study most of patients agreed that sweets affect dental health, similar findings reported by Blaggana, [24] when most of sample subjects were aware that sweets have negative impact on dental health. Contrasting findings were surprisingly reported in Bapat, [25] who found lack of knowledge about the effects of sweets on dental health.

24

The (ADA) recommends regular dental visits at intervals determined by a dentist to obtain optimal oral hygiene at least once/year [26]. The majority of patients in this study reported that they were never visiting dentists for scaling while other patients were visiting dentists once a year or for urgent treatment only, this result is in agreement with a finding by Taani, [27] which revealed that the majority of subjects reported to be irregular dental attenders and tended to visit the dentist more often when having trouble or in pain only.

Similar to findings by Jebur and Ahmed, [12] the majority of study participants were visiting dentist only on emergency while the lowest percentage were on regular visits. Other study Kulshrestha, [28] showed that two thirds of people have never seen a dentist. A perception for above results that there is no need to seek dental care is the commonest reason for avoiding routine dental visit, so missing awareness about the crucial role of regular dental checkups in preventing and detecting dental diseases is another gap in public education.

Regarding pregnancy, this study demonstrates enough knowledge about the effects of PD on pregnancy and problems that cause such as low birth weight, preterm delivery, and preeclampsia, so when we do this study the majority of patients agreed that PD may cause low birth weight. While in other studies like [21] revealed a low awareness about the detrimental effects of PD on pregnancy. The majority of study participants say that gingival swelling doesn't occur during pregnancy. Similar findings showed by Togoo et al., [29] which reported that majority of the patients were unaware about developing gingivitis during pregnancy period. The hormonal effects of pregnancy on periodontal tissues have been demonstrated in many studies, in which a direct relationship between worsening of PD and pregnancy has been demonstrated [30]. During pregnancy, pregnant women have higher PLI, GI, BOP, deeper periodontal pockets and more CAL in comparison with non-pregnant. These clinical signs are reduced after childbirth [31].

Gingivitis begins when dental plaque builds up for days or weeks without being disrupted or removed. Gingival inflammation caused by dental plaque is influenced by a variety of systemic and oral factors, so the appropriate intervention is crucial for the prevention of PDs [32].

The study participants attributed the plaque formation to a variety of consequences including teeth dislocation, gingival disease and teeth malformation. But teeth dislocation was the main answer of the majority of patients. High proportions of respondents in the study of [13] stated that they had never heard about dental plaque, also the majority of patients in the study of Taani [27] did not know what dental plaque cause. The majority of the participants in study done by [33] had poor knowledge regarding the etiology of PD, including the role of dental plaque. Generally, public awareness of gingival disease and particularly the role of dental plaque in relation to PD is weak, presumably due to inadequate health education concerning these conditions.

Gingival bleeding is the first symptom of PD. The use of bleeding sign rather than color changes to diagnose early gingival inflammation is advantageous, in that bleeding is a more objective sign that requires less subjective estimation by the examiner [34]. The majority of survey participants say that poor oral hygiene is the most common reason of bleeding while others believe that Vitamin C deficiency may be the cause. Another study done in Nigeria showed contrasting results as a lower percentage of patients believe that poor oral hygiene is the reason while the majority did not know the reason of bleeding. Most of patients in this study reported that gingival bleeding during brushing is normal [35]. Therefore, to prevent the development of periodontal problems, the public needs guidance in connecting the relationship between gingival bleeding and PD, so an adequate periodontal care system is extremely needed at public level and efforts need to be focused on raising this population awareness of the importance of oral hygiene and on early diagnosis of gingival and periodontal problems [12].

Gingival recession is a common condition and its extent and prevalence increase with age. Many factors including Improper brushing, Nail biting habit and periodontal disease have a role in its etiology. In this present study the majority of patients agreed that improper brushing is the commonest cause of receding gingiva. Whereas others said that nail biting habit is the cause. In another study Abdulkareem et al., [9] only 7% were able to determine the common cause for gingival recession. The opinion that faulty tooth brushing is commonly associated with gingival recession is not supported by Addy and Hunter [36].

Increased tooth mobility is a common symptom of advanced forms of plaque associated periodontal disease and may be associated with different physiologic or pathologic phenomena. The majority of study patients chose periodontal disease as the most common cause of tooth mobility, others suggested another cause like aging and diabetes mellitus .A study by Abdulkareem et al., [9] reported low level of awareness about causes of tooth mobility among their study patients.

In this section the question to the study patients was if they think that hot or cold food is treatable, the answer was " yes " by majority of them, while half of patients gave another answer. The responses to the ability of treating tooth hypersensitivity indicated a difference according to gender and education level in study by Abdulkareem et al., [9].

The present study was attended by patients of different ages, genders and regions in Basrah. And this is a logical reason for the difference observed in the answered questionnaire.

Older people's knowledge of OH and PDD differs from that of adults. This present study shows that there is no significant association between the level of awareness and the age group but higher level of knowledge among those between 30 and 45 years of age and this agreed with Hemalatha et al. [21] which reported that the group of individuals 35–50 years have higher awareness level than the other groups. In contrast to the study done among Andhra Pradesh population [37] where the age group of 18–24 years had higher awareness. This may be explained by cumulative knowledge through lifetime acquired from previous dental experiences potentially encouraging older individuals to preserve their remaining teeth.

Females and males may have different levels of awareness since females are more concerned with beauty and caring. It is important to note that knowledge and awareness about OH and periodontal conditions is

moderate generally, but it's better in female patients specifically. These results were in accordance with the results of Blaggana, [24] where females were aware more than males and findings of Hemalatha et al., [21], but in contrast to study by [11], who showed that males have better knowledge of dental health and diseases than females. There is a need to provide more health education to male subjects in Basrah to improve their OH.

In this study, there is no significant overall difference between the residency and level of awareness, but better achievement is noticed among patients from Al-Zubair discrete, followed by the center of Basrah governorate, while the lowest level of knowledge is noticed among the people of Shat Al-Arab. In contrast to the majority of studies which reported that, "urban people have better awareness and knowledge about periodontal and OH than people of rural areas". In this study good level of knowledge was reported among patients from Al-Zubair discrete. The cause of this controversial result between the current study and previous studies may be a self-related cause as these participants already came with a high level of knowledge about dental health.

### Conclusions

A majority of patients in Basrah University/College of Dentistry, which were the subjects of interest in this study, believed that oral hygiene measures are beneficial for oral health maintenance. However, social factors, living circumstances and general lifestyle continue to be strongly related to OH neglect behaviors. There also existed a poor awareness of etiology, complications, and preventable methods of the PDs. But most of the individuals show an interest in learning about the PD which should be utilized in optimizing their knowledge up to the level they can be involved in the maintenance of acceptable oral health. Today, instruction and motivation of a person, regular visits to the dental office with professional feedback and reinforcement seem to be the most successful approaches in preventing PDs and its progression.

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