

Conference Paper

Effect of Patient's Knowledge and OHI-S on Periodontal Disease Among Age Group 19–64 Years in the Dental Clinic at the Community Health Centre, Bareng, Malang

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Periodontal disease, also known as gum disease, is a combination of several inflammatory conditions accumulated from supporting tissues in the teeth that result from bacterial infections. Periodontal disease develop gradually and become increasingly severe, so maintaining good periodontal health is important. The patient's level of knowledge about periodontal disease can directly affect their periodontal health. It is generally caused by poor oral hygiene. Nevertheless, dental and oral hygiene values can be measured by the Simplified Oral Hygiene Index (OHI-S). This cross-sectional study included patients visiting the Dental Care and Orthodontic Health Clinic at the Community Health Centre in Bareng, Malang, aged between 19 and 64 years. The research instrument used was a questionnaire and patients' medical records.. The results showed a significant relationship between the level of knowledge and the OHI-S with periodontal disease using the contingency coefficient test, with p -value = 0.026 on the variable level of knowledge and p -value = 0.045 on the OHI-S variable. A significant relationship was also seen between the level of knowledge and periodontal disease (p = 0.026) and between OHI-S and periodontal disease (p = 0.045). Further study of the stronger effect between the two is needed.

Keywords: the level of knowledge, Oral Hygiene Index Simplified (OHI-S), periodontal disease

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Published: 25 March 2021

Publishing services provided by
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Selection and Peer-review under the responsibility of the ISMoPHS 2020 Conference Committee.

1. Introduction

The prevalence of periodontal disease in the world has been confirmed to be at least 82% among young people while 50% of them are adults [1]. The most common periodontal disease in the world is gingivitis or gingival inflammation. The prevalence of dental and oral health disorders in Indonesia based on the Indonesian Basic Health Research

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or *Riset Kesehatan Dasar* (RISKESDAS) data revealed in 2013 were 25.9%. The number was reported to increase continuously until 2018 to 57.6%. The most common dental and oral health problems in Indonesia are periodontal diseases including gingivitis and periodontitis, the same cases go with the world [2]. The prevalence of periodontal disease sufferers in Malang according to observations and interviews at the Malang City Health Office were obtained on certain data; the periodontal disease sufferers reached 2,759 cases. It was obtained that the data collected with the highest prevalence was in the Community Health Centre. The highest vulnerable age range as sufferers is 19-64 years.

Clinical symptoms of periodontal disease include bad breath, swollen gums, bleeding gums, pain when chewing, tooth loss and others [3]. In other conditions periodontal disease can develop without causing symptoms appeared in the sufferers [4]. Periodontal disease in general can also be caused by conditions of teeth and mouth that are less clean, this can be determined by conducting an assessment of dental and oral hygiene by referring to the value of the Oral Hygiene Index Simplified (OHI-S) which includes the assessment of debris (DI-S) and calculus (CI-S). Both values of DI-S and CI-S will be used to determine the value of dental and oral hygiene or OHI-S. In this case the assessment is only done on certain tooth surfaces and not on all teeth of the sufferers [5]. In addition, the purpose of the OHI-S assessment can also be used to find out and determine on how the epidemiology of periodontal disease happens [6].

According to Ratmini, periodontal disease will gradually experience worse progress and more severe if it is not carried out to dentists due to routine checks; and it will cause tooth loss consequently [7]. In the study of Kasiha, et al. [8], it is said that the level of knowledge also affects oral health. The knowledge about periodontal can affect the health of periodontal tissue. Periodontal knowledge becomes important to prevent and maintain health in periodontal tissue. By improving the health of periodontal tissues, it is possible to minimize the risk of someone suffering from periodontal disease later on [9].

Periodontal disease begins with gingivitis and chronic periodontitis. The symptoms occur when untreated gingivitis develops to the loss of gingiva, bones, and ligaments. They are the characteristic of this disease and can eventually lead to tooth loss if they are untreated [10]. Worse complications of periodontal disease besides tooth loss are the increased risk of heart attack or stroke as well as complications of other health problems [11]. Based on these problems the researchers intend to conduct a study entitled "The Level of Knowledge and Oral Hygiene Index Simplified (OHI-S) and Their Effect on Periodontal Disease Among the Age Group of 19-64 Years in the Dental Care

and Orthodontic Health Clinic at the Community Health Centre in Bareng, Malang City". The research is expected to determine the relationship between parameters which are the level of knowledge and OHI-S on periodontal disease.

2. Material and Method

This research is a quantitative correlational study using a cross sectional approach. This research was conducted in February 2020 in the Community Health Centre in Bareng, Malang City. The dependent variables in this study were periodontal disease while the independent variables in this study were the level of knowledge and the Oral Hygiene Index Simplified (OHI-S). The instruments used in this study were questionnaires and medical records of patients. The data collecting was done using interview techniques. Analysis of the data used were univariate and bivariate data analysis. Univariate analysis includes the frequency distribution or description of periodontal disease variables, the level of knowledge and the OHI-S. Bivariate analysis in this study used the Contingency Coefficient statistical test.

The sampling technique used was purposive sampling. The sample size calculation used the Slovin formula and the Lemeshow hypothesis of two-sided test formula. The samples of respondents based on the calculation results were 60 samples. The inclusion criteria in this study were patients aged 19 to 64 years and patients who have visited the dental care and orthodontic health clinic at the Community Health Centre in Bareng, Malang City in February. Whereas the criteria for the exclusion were patients within 19-64 years old who had limited hearing, reading or writing and were not willing to participate as research respondents.

3. Results

3.1. Overview of periodontal disease cases in Malang

The following is an overview of periodontal disease cases in the dental care and orthodontic health clinic at the Community Health Centre in Bareng, Malang City:

TABLE 1: Overview of periodontal disease cases.

Periodontal disease	Frequency	Percentage
Sufferer	26	43.3%
Not Sufferer	34	56.7%
Total	60	100%

Based on Table 1, it is known that the frequency distribution of the number of respondents known to suffer from periodontal disease was 26 (43.3%) of total respondents, while those who are not suffered from periodontal disease amounted to 34 (56.7%).

3.2. Characteristics of respondents due to periodontal disease

Below is a description of the characteristics of the age, sex, education and occupation of research respondents as samples who were giving their consent in the dental care and orthodontic health clinic at the Community Health Centre in Bareng, Malang City:

TABLE 2: Overview of respondent's age range.

Age range category	Frequency	Percentage
Late teenagers	22	36.7%
Early adults	11	18.3%
Late adults	12	20.0%
Early elderly	10	16.7%
Late elderly	5	8.3%
Total	60	100%

Based on Table 2, it is known that the most respondents were in the late teenager's category, namely those who are aged 17-25 years old; there were 22 respondents (36.7%). The description of the age characteristics of respondents in the early adult category were among 26-35 years; there were 11 respondents (18.3%). In the late adult category (36-45 years), there were a total of 12 respondents (20.0%). In the early elderly category (46-55 years), there were a total of 10 respondents (16.7%). In the late elderly category (56-65 years), there were a total of 5 respondents (8.3%). The least category having periodontal cases was late elderly.

TABLE 3: Overview of respondent's gender.

Gender	Frequency	Percentage
Male	24	40.0%
Female	36	60.0%
Total	60	100%

Based on Table 3, the most representative gender characteristics of the respondents were female; there were 36 female respondents (60%). Otherwise the male respondents were 24 out of 60 of total respondents (40%). Female respondents were higher than the male ones.

Based on Table 4, the most common description of the educational characteristics of the respondents is that they who were graduated from high school (SMA / MA / SMK),

TABLE 4: Overview of respondent's educational background.

Educational background	Frequency	Percentage
Elementary school graduates	5	8.3%
Junior high school graduates	10	16.7%
Senior high school graduates	41	68.3%
Diploma/Bachelor/Master	4	6.7%
Total	60	100%

namely 41 people (68.3%). Whereas there were 5 elementary school (SD / MI) graduates (8.3%), 10 junior high school (SMP / MTs) graduates (16.7%), and 4 diploma/bachelor / master (6.7%).

TABLE 5: Overview of respondent's occupation.

Occupation	Frequency	Percentage
Household assistant	1	1.7%
Lecturer	1	1.7%
Teacher	1	1.7%
Housewife	19	31.7%
National company employee	1	1.7%
Private company employee	6	10.0%
Students	16	26.7%
Honorary employee	1	1.7%
Pensioner	1	1.7%
Civil servant	2	3.3%
Entrepreneur	8	13.3%
State force	1	1.7%
Unemployed people	2	3.3%

Based on Table 5, the description of the occupational characteristics of research respondents is quite large. The respondents who were occupied as housewives were 19 people (31.7%). Meanwhile, there were 1 household assistant (1.7%), 1 lecturer (1.7%), 1 teacher (1.7%), 1 national company employee (1.7%), 6 private company employees (10%), 16 students (26.7%), 1 honorary employee (1.7%), 1 pensioner (1.7%), 2 civil servants (3.3%), 8 entrepreneurs (13.3%), 1 state force (1.7%), and 2 unemployed people (3.3%) as respondent.

3.3. Overview of respondent's level of knowledge

Below is a description of the level of knowledge of respondents based on data obtained from the questionnaires spread during the study conducted in Barend, Malang City:

TABLE 6: Distribution of correct answer in questionnaires.

No	Knowledge on periodontal disease	N = 60	
		N	%
1.	Periodontal disease knowledge	36	60%
2.	Risk factors on periodontal disease	11	18.3%
3.	Risk factors on periodontal disease	20	33.3%
4.	Signs and symptoms of periodontal disease	48	80%
5.	Signs and symptoms of periodontal disease	47	78.3%
6.	Complication cases of periodontal disease	22	36.7%
7.	Examination and diagnostics of periodontal disease	17	28.3%
8.	Examination and diagnostics of periodontal disease	13	21.7%
9.	Healing and care of periodontal disease	33	55%
10.	Prevention of periodontal disease	39	65%

Based on Table 6, it is known that the frequency distribution of answers to questions on the questionnaires is determined to measure the level of knowledge. The data in the Table 6 explains that the respondent who answers correctly is mostly found in question number 4; there were 48 respondents (80%) in question number 4. Meanwhile the least correctly answered question was happened in question number 2; there were 11 respondents (18.3%).

TABLE 7: Overview of the respondent's level of knowledge.

Level of knowledge	Sufferer		Non-sufferer		Total	
	N	%	N	%	N	%
Very Low	9	15%	3	5%	12	20%
Low	12	20%	14	23.3%	26	43.3%
Sufficient	5	8.3%	15	25%	20	33.3%
High	0	0%	2	3.3%	2	3.3%
Total	26	43.3%	34	43.3%	60	100%

Based on Table 7, it is known that the levels of knowledge of research respondents for periodontal disease were mostly categorized in the low category with the number of 26 people (43.3%). Meanwhile, there were 12 people (20%) who were categorized in the low level of knowledge, 20 people (33.3%) who were categorized in the sufficient level of knowledge, and 2 people (3.3%) who were categorized in the high level of knowledge. Low level of knowledge is the most commonly owned by respondents who suffer from periodontal disease, while those who do not suffer from periodontal cases have sufficient knowledge about periodontal disease.

3.4. Overview of respondent's Oral Hygiene Index Simplified (OHI-S)

Below is the description on respondent's Oral Hygiene Index Simplified (OHI-S) based on doctor's examination and diagnostics on dental care and orthodontic clinic in Malang:

TABLE 8: Overview of respondent's Oral Hygiene Index Simplified (OHI-S)

OHI-S	Sufferer		Non-sufferer		Total	
	N	%	N	%	N	%
Good	5	8.3%	8	13.3%	13	21.7%
Moderate	12	20%	23	38.3%	35	58.3%
Bad	9	15%	3	5%	12	20%
Total	26	43.3%	34	56.7%	60	100%

Based on Table 8, it is known that most respondents have moderate OHI-S examination score; there were 35 respondents (58.3%). Meanwhile, there were 13 respondents (21.7%) who have good OHI-S examination score and there were 12 respondents (20%) who have bad OHI-S examination score. Respondents with periodontal cases have mostly moderate OHI-S examination score yet respondents who didn't experience periodontal disease have mostly moderate OHI-S examination score. Both show the same number of respondents.

3.5. Effect analysis of the level of knowledge on periodontal disease

Below is the effect analysis results on the level of knowledge on periodontal disease in respondents who have visited dental care and orthodontic clinic in Bareng, Malang:

TABLE 9: The relationship between the level of knowledge and periodontal disease.

Level of knowledge	Periodontal disease				Total		Significance value	P- value
	Sufferer		Non-sufferer		N	%		
	N	%	N	%				
Very low	9	15%	3	5%	12	20%	0.026	
Low	12	20%	14	23.3%	26	43.3%	0.286	
Sufficient	5	8.3%	15	25%	20	33.3%	0.111	
High	0	0%	2	3.3%	2	3.3%	0	
Total	26	43.3%	34	43.3%	60	100%		

Based on Table 9, it is known that the statistical test results using the Contingency Coefficient test between the level of knowledge variable with the incidence of periodontal disease is determined to have a considerable relationship (significant) because at $\alpha = 0.05$ and 95% confident interval, the obtained p-value was 0.026. From the calculation of Prevalence Ratio (PR), it is known that the level of knowledge is a preventative factor for someone suffering from periodontal disease because the value of $PR < 1$. Both have significant relationship.

3.6. Effect analysis of the Simplified Oral Hygiene Index (OHI-S) and periodontal disease

Below is the effect analysis results between the Oral Hygiene Index Simplified (OHI-S) and periodontal disease respectively on patients, which are presented in Table 10:

TABLE 10: The relationship between dental hygiene care and periodontal disease.

OHI-S examination score	Periodontal disease				Total		Significant P-value	P-value
	Sufferer		Non-sufferer		N	%		
	N	%	N	%				
Good	5	8.3%	8	13.3%	13	21.7%	0.045	
Moderate	12	20%	23	38.3%	35	58.3%		0.835
Bad	9	15%	3	5%	12	20%		4.800
Total	26	43.3%	34	56.7%	60	100%		

Based on Table 10, it is known that the results of the statistical test analysis using the Contingency Coefficient test between the variable Oral Hygiene Index Simplified (OHI-S) with periodontal disease have a considerable relationship (significant) because at $\alpha = 0.05$ and 95% confident interval, the obtained p-value was 0.045. A good OHI-S examination score is a preventative factor for someone suffering from periodontal disease due to $PR < 1$. While a bad OHI-S category is a risk factor for someone suffering from periodontal disease due to $PR > 1$.

4. Discussion

4.1. The effect analysis of the level of knowledge on periodontal disease

The statistical test shows that there is a significant relationship between the level of knowledge about periodontal disease and the incidence of periodontal disease, with

the result of p -value = 0.026. Based on the results of the analysis, the value of Prevalence Ratio (PR) at the low level of knowledge is 0.286, the PR value at the level of knowledge is quite high at 0.111 and the value of PR at the high level of knowledge is 0, so it can be said that the level of knowledge is a factor inhibitors / prevention of someone suffering from periodontal disease because the PR value <1 . The significant factor affecting is ruled in periodontal disease.

In other studies that are also in accordance with the results of this study are research conducted by Gholami, et al. [12] states that, there is a significant relationship between knowledge about periodontal with periodontal status, with p value = 0.001 and El-Qaderi & Ta'ani research which states that there is a significant relationship between patients' knowledge about periodontal with the incidence of periodontal disease in patients [9].

The importance of oral health is still a neglected social problem because some people do not know the impact of dental and oral health problems and it is one of which triggers a dangerous systemic disease in human body [13]. Therefore, sufficient awareness and knowledge will maintain oral health [13]. To be able to change a person's behaviour or overt behaviour, knowledge becomes one of the factors that can influence it persistently. Knowledge can make someone more consistent to maintain good behaviour and attitude for longer, than someone who does not equip themselves with good knowledge [14].

Knowledge is one of the factors that affect dental and oral hygiene in a person [15]. The cause of dental and mouth problems in the community one of which is a behaviour or attitude factor [15]. Good knowledge will affect health behaviour in improving health, especially dental and oral health [15]. Knowledge becomes one of the factors, influencing someone to come for an examination as at the level of knowledge that is getting better. Then, someone will have better understanding on how important it is to check self-health services in a routine schedule [16]. Knowledge about periodontal disease is very important to have in order to prevent and also maintain health in periodontal tissue to avoid serious illness later [12].

Based on the results of research in general, it was found that the younger age group had more symptoms of gingivitis (inflammation of the gums), so it is a new fact, that periodontal disease is more common in the younger age group. This is in line with research by El-Qaderi & Ta'ani [9] which also has many young respondents who suffer from periodontal disease. Whereas in the younger age group they have better awareness and alertness compared to the older group, therefore the level of knowledge of periodontal disease provide an important role for preventing periodontal disease from a young age since early stage of adulthood.

As an effort to prevent and promote health about periodontal disease cases, the level of knowledge and attitude about periodontal disease is very important to give in such a young age [17]. It has been proven that high knowledge level scores in some populations influence the incidence of periodontal disease in that population [17]. Adequately, this is supported by a proper health education program in formal and non-formal stage [17]. Knowledge makes a person to have changes in behaviour and these changes depend on how much a person understands about periodontal disease, so it is important to do prevention [12]. Knowledge of periodontal disease provides an important role to prevent periodontal disease from a young age [9]. Limited knowledge about periodontal disease in most societies is one of the causes of low awareness to get checked out earlier [9].

4.2. The effect analysis of Oral Hygiene Index Simplified (OHI-S) on periodontal disease

The results of the statistical test analysis using the contingency coefficient test found that between the variable Oral Hygiene Index Simplified (OHI-S) with periodontal disease there was a significant relationship because at $\alpha = 0.05$ and 95% confident interval, it is obtained that the p-value was 0.045. A good OHI-S examination score is a preventative factor for someone suffering from periodontal disease due to $PR < 1$. While a bad OHI-S category is a risk factor for someone suffering from periodontal disease due to $PR > 1$ respectively on both factors.

Research that is also in line with this research is the research conducted by Sukanti at SMP PSM Kota Bukittinggi, stating that there is a significant relationship between the status of dental and oral hygiene (OHI-S) on the status of gingiva (gingivitis), with p value = 0,000 [18]. Meanwhile, a study conducted in Semarang City stated that there was a significant relationship between the status of dental and oral hygiene (OHI-S) with the incidence of periodontal disease, with a p value = 0.001 [1].

The main etiological factor of periodontal disease is bacterial plaque [6]. The main cause of gingivitis or periodontitis is due to plaque build-up of the mouth [19]. Plaque build-up on teeth is caused by improper brushing techniques daily, interdental cleaning with poor dental floss and irregular dental visits [20]. It is known that the accumulation of microorganisms in plaques in large numbers is the beginning of the destructive periodontal disease [6]. The speed of plaque accumulation is related to the process of gingivitis. Furthermore, it is known from the results of the average plaque score that rises and the average score of gingivitis which also rises [6]. Which can facilitate the accumulation of plaque is debris and calculus material that is in the teeth, so that dental

and oral hygiene checks with OHI-S can find out determine on how much debris and calculus are contained in teeth [19]. To prevent or reduce plaque accumulation / plaque removal, plaque cleaning is a fundamental part of periodontal tissue health. If a person can maintain regular oral and dental hygiene, then she or he can limit the risk of more severe periodontal disease because the prevalence of periodontal disease increases with increasing age and almost close to 100% due to conditions of poor oral hygiene accumulated [19].

A proper and good maintenance of dental health can be done by cleaning plaque and tartar once every two to three months [6]. Due to this dental and oral care, we can reduce the risk of periodontal disease in the community [6]. Dental and oral health is very important, if we do not maintain dental and oral hygiene, it can increase the risk of gingivitis, which is the beginning of periodontitis [6]. The risk of periodontitis will increase about two to five times because of poor dental and oral hygiene assist can occur in individuals of all ages [6, 20]. A poor oral hygiene is a risk factor for periodontal disease [20]. Dental and oral hygiene is a problem that needs attention and is important to consider in wider campaign. One of the effects of poor oral hygiene is to trigger various diseases in the oral cavity, especially periodontal disease [21].

Good habits of caring for teeth and mouth as dental and oral care, such as brushing teeth properly, and doing regular scaling and dental examinations, can improve oral and dental hygiene [3]. The state of the oral cavity which is always controlled for hygiene will be able to reduce the occurrence of periodontal disease. Consequently, it can be said that the state of dental and oral hygiene has a close relationship with the incidence of periodontal disease [22].

5. Conclusion

Based on the results of the research that has been described, it can be concluded that there is a significant relationship between the level of knowledge with periodontal disease among the age group of 19-64 years in the dental care and orthodontic health clinic at the Community Health Centre in Bareng, Malang City, with a p-value <0.05 (0.026). Meanwhile, there is a significant relationship between the Oral Hygiene Index Simplified (OHI-S) examination variable with periodontal disease with a p-value <0.05 (0.045). Most periodontal disease sufferers have a low level of knowledge and moderate OHI-S examination score.

Acknowledgement

We would like to thank the lecturers of Universitas Negeri Malang who help us for validating the instruments and the research participants in the data collection. Also, we would like to express our greatest gratitude to Universitas Negeri Malang for funding the study.

Conflict of Interest

The author declare that they have no conflict of interest.

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