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ABSTRACT

Background: Periodontal disease is an infection in the oral cavity that is often found in the community and is considered as the number two disease in the world after dental caries. The higher the age, the higher the index of periodontal disease and if no prevention is carried out it can affect a person's quality of life. This study aims to determine the relationship between risk factors and the occurrence of periodontal disease.

Method: This type of research is observational with a cross-sectional design. The sample in this study was taken by proportional random sampling and it was obtained as many as 250 patients aged 15-55 years. The risk factors studied were: OHI-S index, instantaneous blood sugar, knowledge of periodontal disease, dental and oral health maintenance behavior, food selection behavior, smoking habit, and utilization of health services. Measurement of periodontal disease based on the state of gingival infection and the data were analysed using the chi-square test.

Result: The results of the chi-square test obtained the OHI-S index, knowledge of periodontal disease, dental and oral health maintenance behavior, food selection behavior, personal blood sugar, and utilization of dental health services ($p < 0.05$). The relationship between smoking habits and the occurrence of periodontal disease was $p > 0.05$

Conclusion: the risk factors: OHI-S, knowledge of periodontal disease, dental and oral health maintenance behavior, food selection behavior, instantaneous blood sugar levels, and utilization of dental and oral health services are significantly associated with the occurrence of periodontal disease.

INTRODUCTION

Dental and oral health is fundamental for our general health because oral cavity serves as an important function in speaking, digesting food, communicating, and socializing. Periodontal disease is one of oral and dental diseases which is found in the community and can affect individual's quality of life.¹

The periodontal disease index, especially the gingivitis index, in the age range between 15-

24 years is 0,69%, 25-34 years 0,74%, 35-44 years 0,76%, 45-54 years 0,76%, 55-64 years 0,75% and above 65 years 0,73%.² The report on the result of national basic health research 2018 shows that as age increases, the higher the periodontal disease index which tends to occur in people with low income will be.³

Bacteria in periodontitis are *Streptococcus Sanguinis*. They attach to teeth and can enter bloodstream, causing inflammation in blood vessel

wall. Once inflammation occurs in the blood vessels, atherosclerosis can occur and in turn become stroke disease.³

Periodontal disease is a type of destructive inflammation disease in dental support issues caused by specific microorganism which cause further damage in periodontal ligament and alveolar bone as indicated by the existence of pocket, gingival recession, or both. Periodontitis is often developed from existing gingivitis, although not all gingivitis can develop into periodontitis. Changes in composition and pathogenic potency from plaque microorganisms on a host's resistance factors and surrounding tissues determine the change from gingivitis into periodontitis and the severity of damage in periodontal tissues⁴. Periodontal disease can often be found in patients' subgingival plaque with chronic periodontitis. Three bacteria causing it are *Porphyromonas gingivalis*, *Treponema denticola* and *Bacteroides forsythus*.¹ Examinations on the condition of periodontal tissues which are performed to determine the degree of severity of a periodontal disease are probing depth, clinical attachment level, and bleeding on probing.⁵

One of efforts to reduce impacts of systemic diseases manifested in oral cavity is to conduct early diagnosis, prevention, and effective management to systemic diseases. A study in epidemiology reports that periodontal disease becomes one of factors which causes cardiovascular diseases, stroke, and peripheral artery diseases.⁴ In order to increase the promotional efforts of dental health, risk factors which cause periodontal disease must be identified.

Therefore, this study aimed to identify the relationship between risk factors and periodontal disease.

RESEARCH METHOD

This study was observational with the analytical cross-sectional design. The population of study consisted of patients being treated at dental health clinics in community health centres, Sleman regency, during April-Juni 2021. The samples consisted of dental patients with age range between 15-55 years in six community health centres in Sleman regency, The Special Region of Yogyakarta. The samples, consisting of 250 respondents, were acquired with the proportional random sampling method. The inclusive criteria for respondents are 1) male and female patients with age range between 15-55 years, 2) respondents' willingness to become samples of the study, and 3) not pregnant (for females). The exclusive criteria are respondents are unable to participate or get sick when the study is being conducted.

The study was conducted by measuring respondents' periodontal diseases: the conditions of gingivitis infection and periodontal pocket were examined. The risk factors being measured were the oral and dental hygiene (OHI-S) index according to Green and Vermilion, the knowledge of periodontal disease, the dental and oral health maintenance behavior, the food selection behavior, the instantaneous glucose levels, the smoking habit, and the utilization of health service.

The research instruments were; 1) periodontal disease measurement sheets for measuring gingiva inflammation and depth of periodontal pocket, 2) the OHI-S index, with degrees as follows: high: 3,1-6, moderate: 0,13-3,0, and low: 0-1,12 (Green and Vermilion), 3) the questionnaires regarding periodontal disease which consisted of 8 question items and score indications as follows: high: 5-8, low :1-4, 4) the questionnaires regarding oral and dental health maintenance behavior which consisted of 10

question items and score indications as follows high: 26-40 and low: 10-25, 5) the questionnaires regarding food selection behavior which consisted of 4 question items and score indications as follows high:11-16 and low:4-10, 6) the instantaneous blood sugar level where it is considered high if it is more than 200 mg/dl and low if it is less than or equal to 200 mg/dl, 7) the check-lists regarding the smoking habit, with smoking means high score while not smoking means low score, 8) the check-lists regarding the utilization of dental health services, with check-ups more than two times a year means high score while check-ups less or equal to twice a year means low score, and 9) the periodontal diseases

in this study if gingivitis and periodontal pocket depth were more than 3 mm. the study was conducted after the researchers received the permission from the Committee of Ethics and Research of Health Polytechnic of Health Ministry Yogyakarta no: No. e-KEPK/POLKESYO/0304/III/2021.

RESEARCH RESULT

Table 1 shows that the dominant characteristics of respondents are 1) female, within age range of 15-25 years, have senior high school education, housewives, and whose household incomes were lesser than Rp2.500.000.

Table 1. Distribution of characteristics of respondents

Characteristics of respondents	n	%
Gender		
Male	96	38,4
Female	154	61,6
Age range		
15-25 years	90	36
26-35 years	70	28
36-45 years	59	23,6
46-55 years	31	12,4
Education		
Not schooled	0	0
Elementary School (SD)	9	3,6
Middle School (SMP)	25	10
Senior High School (SMU)	127	50,8
Diploma	13	5,2
Higher education	76	30,4
Occupation		
Housewife	83	31,2
Farmer	35	2,0
Merchant	46	4,0
Private employee	39	15,6
Government employee	47	14,4
Income		
More than Rp5.000.000	39	15,6
Rp2.500.000 - Rp5.000.000	64	25,6
Lesser than Rp2.500.000	147	58,8

Table 2. Description of risk factors of periodontal disease

Risk factors of periodontal disease	Minimum	Maximum	Average	SD
OHI-S	1,1	3,6	3,29	0,63
Knowledge of periodontal disease	1	8	6,43	1,49
Oral and dental health maintenance behavior	10	40	29,88	4,09
Food selection behavior	7	16	12,04	1,81
Instantaneous blood sugar level	80	265	147,06	46,19
Smoking habit	1	2	1,82	0,39
Utilization of oral and dental health services	1	2	1,42	0,49

Note: SD: Standard Deviation

Table 3. The result of chi-square analysis between risk factors and periodontal disease

Risk factors	Criteria	Periodontal disease		p-value (sig)	X ²
		Low n (%)	High n (%)		
OHI-S	High	101(40,4)	149(59,6)	0,000*	0,00
	Low	0(0,00)	0(0)		
Knowledge of periodontal disease	High	89 (35,6)	137(54,8)	0,038*	0,317
	Low	12(4,8)	12(4,8)		
Oral and dental health maintenance behavior	High	99(39,6)	147(58,8)	0,001*	0,696
	Low	2(0,8)	2 (0,8)		
Food selection behavior	High	98(39,2)	146(58,4)	0,036*	0,631
	Low	3(1,2)	3 (1,2)		
Smoking habit	Smoking	14(5,6)	31(12,4)	0,182	0,156
	Not smoking	87(34,8)	118(47,2)		
Instantaneous blood sugar level	High	25(1,0)	51(20,4)	0,012*	0,107
	Low	76(30,4)	98(39,2)		
Utilization of oral and dental health services	High	45(18,0)	59(23,6)	0,041*	0,436
	Low	56(22,4)	90(36,0)		

Note: * = there is a significant relationship (p < 0,05)

In this study, periodontal diseases were determined by measuring the condition of gingiva. It was obtained that 101 respondents (40%) had a low criteria (healthy gingiva) and 149 respondents (58,65%) had high criteria (gingivitis).

DISCUSSION

The results of study (Table 2) show that the mean value of respondents' oral and dental hygiene measured with the OHI-S index is 3,29±0,63 (high). Many respondents (59,6%) have high OHI-S index and high periodontal diseases (see Tables 2 and 3). The high value of the OHI-S index was determined by the oral and dental health

maintenance behavior, meal pattern, and poor teeth brushing method.⁶

The mean value of the knowledge of periodontal disease is 6,43±1,49 (high). Many respondents have high level of knowledge and periodontal disease (54,8%) (Tables 2 and 3). Individual's knowledge is influenced by predisposition factors such as economics status, age, gender, and family structure. The population's level of knowledge of periodontal disease influences the occurrence of periodontal disease in the population. Therefore, a good health education program both in formal or informal phases are necessary.⁷

Based on Table 2, the mean values of oral and dental health maintenance and food selection behaviors are $29,88 \pm 4,09$ (high) and $12,04 \pm 1,81$ (high). The results are in accordance with the chi-square analysis (Table 3), where many respondents (58,8%) have high values in the oral and dental health maintenance behavior and periodontal disease. The same goes for the food selection behavior: many respondents (58,4%) have high values in the food selection behavior and periodontal disease (see Table 3). The high level of food selection behavior was influenced by the high level of knowledge.⁷ The results were also influenced by the level of education of respondents which in this study was also high, diploma (5,2%) and higher education (30,2%) (see Table 2).

The result of measurement of blood sugar level showed a mean value of $147,06 \pm 46,19$ (low). 39,2% respondents had low glucose level and high periodontal disease. Physical activities or regular exercises can decrease and maintain blood sugar to normal level. Basically, one does not have to perform intense exercises. Light exercise or other physical activities are sufficient for maintaining health. Exercises can increase the usage of glucose.⁸

The mean value of the smoking habit criteria in this study was $1,8 \pm 0,39$. 47,2% respondents did not smoke and had high periodontal disease (see Table 3). This shows that smoking is still one of dominant behaviors in communities. The prevalence of smoking in Indonesia is considered high. More men tend to smoke compared to women. The data provide by the Report on the Result of National Basic Health Research 2018 shows that the percentage of smokers with ages above 15 years is 33,8%. The percentage of total number of male smokers is 62,9% while the percentage of total number of female smokers is 4,8%. The increase in the

number of smokers is accompanied by the increase in diseases caused by smoking such as hypertension, stroke, diabetes, heart attack, and cancer.²

The mean value of utilization of oral and dental health services is $1,4 \pm 0,49$. This means that every year, respondents had oral and dental check-up once (see Table 2). The low level of utilization of oral and dental health services causes a high level of oral and dental diseases in the community.⁹ Other factors which influence the utilization of oral and dental health services is perception towards the need for certain health service and assessment towards the need for or benefits of such service.¹⁰

The chi-square analysis result shows that there is a relationship between the OHI-S index and periodontal disease ($p < 0,05$). Periodontal disease can develop in individuals with poor oral and dental conditions. The disease is caused by the accumulation of debris which, if not being cleaned soon, can transform into plaque. In turn, the plaque will reduce pH in saliva, making it easier for the bacteria to develop and damage periodontal tissues.¹¹

A significant relationship is found between the knowledge level of periodontal disease and the occurrence of periodontal disease with $p\text{-value} = 0,038$. This result shows that there is a relationship between the knowledge level and the occurrence of periodontal disease.¹² Knowledge allows individuals to change their behavior. The change depends on the level of comprehension they have regarding the periodontal disease. Therefore, prevention can be conducted.¹³ The importance of oral and dental health is still ignored because some people do not know that oral and dental problems can cause dangerous, systemic diseases in their bodies.¹⁴ In order to change individual's behaviors or overt

behaviors, knowledge can be used to influence it constantly. Knowledge can help individuals to be consistent in maintaining their behavior and attitude longer than those who do not possess such knowledge. Knowledge of periodontal disease is one of factors which can influence individuals' oral and dental health because most oral and dental problems in the community are caused by their behavior and attitude. Good knowledge will influence healthy attitude towards health improvement, especially in the oral and dental area.¹²

The chi-square analysis result shows that there is a significant relationship in the occurrence periodontal disease ($p < 0,05$). Periodontal disease in patients with type 2 diabetes is generally in form of chronic inflammation.¹³ Many studies report that there is a two-way relationship between periodontal disease and the high level of blood sugar among diabetic patients.¹⁴ An epidemiology study shows that diabetic patients with uncontrolled blood levels have high risk of having periodontal diseases.¹³ The high level of blood sugar in patients of diabetes mellitus changes the responses of periodontal tissues towards local factors, increasing the rate of bone loss and prolonging the duration of treatment.¹⁴ In diabetic patients, there is increase in the attachment loss and the pocket depth which is accompanied with periodontitis.^{5,13} A greater prevalence of gingivitis can be caused by the difference of a subject's condition and exposure of other risks.¹⁶

The analysis result of risk factors regarding the smoking habit on periodontal disease is $p = 0,182$. The result shows that the smoking habit does not significantly influence the occurrence of periodontal disease. It is because some respondents in this study had higher education (50,85%). The smoking habit is

influenced by the level of education. The higher the level of education one has, the easier they can acquire knowledge or information. Acquiring information from various sources widens one's knowledge.¹⁷

The motivation for visiting dentists will emerge once one has unwanted experiences from their oral and dental disease.¹⁸ They will have better understanding on the importance of dental health maintenance if they conduct dental examination frequently.¹⁹ While visiting a dentist, the dentist will provide knowledge regarding periodontal diseases. Early prevention can be conducted if any cause or symptom of periodontal disease can be identified as early as possible, therefore avoiding a worse condition.^{14,20} Prevention and health improvement regarding periodontal disease are better performed at young ages.²¹ Limited knowledge regarding periodontal disease in most citizens is one of factors that causes their low awareness to have early dental examination.⁶

CONCLUSION

Based on the research result and discussion, the risk factors of the OHI-S index, the knowledge of periodontal disease, the oral and dental health maintenance behavior, the food selection behavior, the instantaneous blood sugar level, and the utilization of oral and dental health services are related to the occurrence of periodontal disease.

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REFERENCES

1. Ferreira MC, Diaz-Ferreira MC, Branco-de-Almeida LS, Martins CC, Paiva SM. *Impact of periodontal disease on quality of life: a systematic review*, Journal of Periodontal Research, 2017; 52(4), 651–665.
2. Kemenkes. *Riset Kesehatan Dasar 2018*, Badan Penelitian dan Pengembangan Kesehatan, 2019
3. Fatima G, Ahtar MJ, Navee N, Ahmd, M, Tariq, M, Khawaja AR. *Diabetic Patients and Periodontitis: a Study*, Pakistan Oral & Dental Journal, 2017; 37(2), 290–294.
4. Schmalz G and Ziebolz D, *Special Issue, Oral Health and Systemic Diseases*, J. Clin. Med, 2020; 9, 3156.
5. Newman MG, Takei HH, Klokkevold PR, Carranza FA. *Newman and Carranza's, Clinical Periodontology* 13th Edition. Philadelphia: Elsevier; 2013, 55-396.
6. Andari I, Astuti RWG, Yunus M. *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*, ISMoPHS 2020 The 2nd International Scientific Meeting on Public Health and Sports, 2021.
7. Choi E, and Jung D. *Factors Influencing Oral Health-Related Quality of Life in Older Adults in Rural Areas: Oral Dryness and Oral Health Knowledge and Behavior*, Int. J. Environ. Res. Public Health, 2021; 18, 4295.
8. Chua SS., and Chan SP. *Medication adherence and achievement of glycaemic targets in ambulatory type 2 diabetic patients*. Journal of Applied Pharmaceutical Science, 2011; 1(4): 55-59.
9. Penmetsa GS, Praveen G and Venkata RA. *Impact of Periodontal Knowledge and Attitude on The Status of The Periodontium: A Profile on West Godavari District, Andhra Pradesh, India*. Indian Society of Periodontology, 2019; 23(4): 362–366.
10. Gambhir RS, Brar P, Singh G, Sofat A, Kakar H. *Utilization of dental care: An Indian outlook*. J Nat Sci Biol Med. 2013; 4:292–7.
11. Sari R, Herawati D, Nurcahyanti R, Wardani PK. *Prevalensi Periodontitis pada Pasien Diabetes Mellitus (Studi Observasional Di Poliklinik Penyakit Dalam RSUP Dr.Sardjito*.
Majalah Kedokteran Gigi Indonesia.,2017; 3(2): 98-104.
12. Alzammam, N dan Almaliki A. *Knowledge and awareness of periodontal diseases among Jordanian University students: A cross-sectional study*, Journal of Indian society of periodontology. 2019; 23 (6) Page : 574-579.
13. Jourdain ML, Velard F, Pierrard L, Sergheraert J, Gangloff SC, Braux J. *Cationic antimicrobial peptides and periodontal physiopathology: A systematic review*. J. Periodontal Res. 2019; 54, 589–600.
14. Bathla S. *Textbook of Periodontics*. New Delhi: Jaypee Brother Medical Publishers. 2017:129, 145, 330-1
15. Madianos PN, Koromantzios PA, *An update of the evidence on the potential impact of periodontal therapy on diabetes outcomes*. J. Clin. Periodontol. 2021, 45: 188–195.
16. Rusdani, Esmirald N. *Hubungan Tingkat Pendidikan dengan perilaku Merokok pada karyawan laki-laki Universitas Batam*. Zona Kedokteran. 2019; 9 (3) .
17. Hajek A, Kretzler B. and König HH. *Factors Associated with Dental Service Use Based on the Andersen Model: A Systematic Review*. Int. J. Environ. Res. Public Health. 2021; 18 2491
18. Halvari AEM, Hallgeir H H, Edward L D, Geoffrey CW. *Motivation and anxiety for dental treatment and dental attendance: The roles of the locus of causality personality and treatment styles*. J Appl Soc Psychol. 2020; 50:133–144.
19. Pamunarsih P, Santoso B and Sukini, S. *Factors Affecting The Low Utilization of Dental Polyclinic in Karanganyar II Community Health Center on Demak*. Jurnal Kesehatan Gigi Politeknik Kesehatan Kemenkes Semarang. 2018; 8 (1):8-15
20. Pengpid S and Peltzer K. *Prevalence and correlates of dental service utilisation among a national general adult population sample in Sudan*. 2021; 21:61
21. Eman S, Almadadi, Bauman A, Akhter R, Gugusheff J , Joseph VB, Sankey M, Janet E.P, David J, Kavanagh, Gregory J, Seymour, Cullinan MP, and Eberhard J. *The Effect of a Personalized Oral Health Education Program on Periodontal Health in an At-Risk Population: A Randomized Controlled Trial*. Int. J. Environ. Res. Public Health. 2021;18: 846.

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