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Original Research Article

# Knowledge of periodontal disease and oral hygiene status (OHI-S) to periodontal disease: A cross-sectional study

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## Abstract

Periodontitis is considered the second most common dental and oral disease in the world after dental caries. The bacterium in periodontitis is *Streptococcus sanguinis* and attaches to the teeth and enters the bloodstream, causing inflammation of the walls of blood vessels. After inflammation occurs in the blood vessels, atherosclerosis will occur and then a stroke can occur. This study aims to determine the relationship of knowledge about periodontal disease and dental and oral hygiene status (OHI-S) to periodontal disease. Analytic observational research with cross-sectional design. The study was carried out on patients from the Dental Polyclinic of the Community Health Center, in the Sleman Regency area. The research sample was taken using a proportional random sampling technique, as many as 250 people. The independent variable in this study was knowledge of periodontal disease and OHI-S while the dependent variable was periodontal disease. Collecting data using a questionnaire, examination of the OHI-S index, and the Community Periodontal Index (CPI). Data analysis using Chi-Square. Knowledge of periodontal disease against periodontal disease showed that the p-value was 0.000 ( $p < 0.05$ ) and the OHI-S index for the periodontal disease had a p-value of 0.038 ( $p < 0.05$ ). There is a significant relationship between knowledge about periodontal disease and OHI-S to periodontal disease.

**Keywords** Knowledge, OHI-S, Periodontal disease

## Introduction

Oral and dental health is fundamental to general health, because the oral cavity functions in speaking, chewing food, communicating, and socializing (R R Pudentiana et al., 2021). Periodontal disease is one of the most common dental and oral diseases in the world community, especially in Indonesia. Periodontal disease can affect a person's quality of life (Ferreira et al., 2017). Based on the results of the 2018 Basic Health Research, the index of periodontal disease, especially gingivitis in the 15-24 age group was 0.69%, the 25-34 age group was 0.74, the 35-44 year age group was 0.76, the 45-54-year-old group was 0.76, aged 55-64 years as many as 0.75 and over 65 years as many as 0.73. These results show that,

the older you get, the higher the periodontal disease index (Kemenkes, 2018).

Periodontitis is an infection of the oral cavity that is often found in the community. Periodontitis is considered the number two disease in the world after dental caries (Pudentiana et al., 2021). Periodontitis tends to lead to economically disadvantaged communities or areas. The bacteria in periodontitis is *Streptococcus sanguinis* and adheres to the teeth and can enter the bloodstream and cause inflammation of the walls of blood vessels. After inflammation occurs in the blood vessels, atherosclerosis can occur and then stroke can occur (Fatima et al., 2017).

Periodontitis is a destructive inflammatory disease of the supporting tissues of the teeth caused by specific microorganisms, which results in further destruction of the periodontal ligament and alveolar bone with pocket formation, gingival recession, or both (Kononen et al., 2019). Periodontitis usually develops from preexisting gingivitis, although not all gingivitis progresses to periodontitis. Changes in the composition and pathogenic potential of plaque microorganisms against host and surrounding tissue resistance factors determine the change from gingivitis to periodontitis and the severity of periodontal tissue damage (Notohartoyo & Suratri, 2016).

Periodontal disease is commonly found in the subgingival plaque of patients with chronic periodontitis. The three bacteria are *Porphyromonas gingivalis*, *Treponema denticola* and *Bacteroides forsythus* (Ferreira et al., 2017). Examination of the condition of the periodontal tissue is carried out to determine the severity of periodontal disease, including measuring pocket depth (probing depth), clinical attachment level, and bleeding on probing (Takei et al., 2012).

WHO has determined that the Global Goals for Oral 2020 aim to minimize the impact of dental and craniofacial diseases. One of them is by promoting and reducing the impact of systemic diseases that manifest in the oral cavity, through early diagnosis, prevention, and effective management of systemic diseases. In epidemiological studies, it was reported that periodontal disease is a risk factor for cardiovascular disease, stroke, and peripheral arterial disease (Notohartoyo & Suratri, 2016).

Periodontal disease is influenced by various factors, including the maintenance of oral health is still relatively low (Bashirian et al., 2018), so it has an impact on increasing the Oral Hygiene Index Simplified Index (OHI-S) (Sari et al., 2017).

**Materials and Methods**

This study is an observational study with a cross-sectional approach. The research was conducted at the Dental Polyclinic of the Public Health Center in the Sleman Regency, DIY Province. The research sample was taken using a proportional random sampling technique, as many as 250 people. The independent variable in this study was knowledge of periodontal disease and OHI-S while the dependent variable was periodontal disease.

The data collection of periodontal disease knowledge was measured by questionnaire, and the researcher conducted a validity and reliability test. OHI-S data was measured using the OHI-S index check sheet. Periodontal disease data were measured using the Community Periodontal Index (CPI) examination sheet.

Data analysis was carried out using the SPSS statistical program, descriptive analysis to calculate variable descriptions, calculating proportions and means, and bivariate analysis with chi-square test to measure the relationship between Knowledge about periodontal disease and OHIS to periodontal disease.

**Results**

**Table 1. Description knowledge about periodontal disease and OHI-S**

Variable	Min	Max	Mean	SD
Knowledge about periodontal disease	1	8	6.43	1.488
OHI-S	1.1	3.6	2.289	0.625

Table 1. shows that the mean of knowledge of periodontal disease is 6.43 including the high category while the mean value of OHI-S is 2.289 including the high category.

**Table 2. Description of periodontal disease**

Variable	Min	Max	Mean	SD
Periodontal disease	0	4	2.43	1.020

Table 2. shows that the mean of periodontal disease (periodontal pocket) was 2.43 (high).

**Table 3. Distribution of knowledge about periodontal disease and OHI-S**

Variable	High		Low	
	n	%	n	%
Knowledge about periodontal disease	226	90.4	24	9.6
OHI-S	250	100	0	0

Table 3. shows that all respondents have high OHI-S criteria (100%) and some knowledge about periodontal disease (90.4%).

**Table 4. Distribution of knowledge about periodontal disease and OHI-S**

Periodontal disease	Pocket <3 mm		Pocket >3 mm	
	n	%	N	%
Periodontal pocket depth	101	40.4	149	59.6

Table 4. shows that most of the periodontal diseases were high as many as 149 respondents (59.65%).

**Table 5. Results of chi-square analysis between knowledge about periodontal disease and OHI-S with periodontal disease**

Variable	Criteria	Periodontal disease		p-value
		High	Low	
		n (%)	n (%)	
Periodontal disease	High	101 (40.4)	149(59.6)	0.000
	Low	0 (0)	0 (0)	
OHI-S	High	89 (35,6)	137(54,8)	0.038
	Low	12 (4,8)	12 (4,8)	

Table 5. shows that The results of the chi-square analysis of knowledge about periodontal disease and OHI-S on periodontal disease showed that the p value <0.05 means that there is a significant relationship between knowledge about periodontal disease and OHI-S on periodontal disease.

### Discussion

The results showed that the respondent's dental and oral hygiene index as measured by the OHI-S index was 3.29+0.63 and most of the respondents (59.6%) had a high OHI-S index and had high periodontal disease. The results of the analysis showed that there was a relationship between the OHI-S index and periodontal disease. According to (Astuti et al., 2021), periodontal disease can develop in individuals with poor oral and dental conditions. This is because the accumulation of debris if not cleaned can develop into plaque so that it continues to decrease salivary pH and bacteria are easy to grow and damage the periodontal tissue.

Knowledge of a person is influenced by predisposing factors, namely economic status, age, gender, and family structure (Notoatmodjo, 2010). Statistical test showed that there was a significant relationship between the level of knowledge about periodontal disease and the incidence of periodontal disease, with p-value = 0.038. These results show that there is a relationship between the level of knowledge and the occurrence of periodontal disease (Yilmaz et al., 2021). The level of knowledge about periodontal disease affects the incidence of periodontal disease in the population. Therefore, the importance of health education programs both at the formal and non-formal stages. Knowledge makes a person experience behavioral changes and these changes depend on how much a person understands about periodontal disease, so it is important to do prevention (Astuti et al., 2021).

The importance of dental and oral health is still a neglected social problem because most people do not know the impact of dental and oral health problems and this is one of them that triggers dangerous systemic diseases in the human body (Alzammam & Almalki, 2019). To be able to change a person's behavior or overt behavior, knowledge becomes one of the factors that can influence it continuously. Knowledge can make a person

more consistent to maintain good behavior and attitudes longer, than someone who does not equip himself with good knowledge. Knowledge is one of the factors that affect dental and oral hygiene in a person because the cause of dental and oral problems in the community, one of which is a behavior or attitude factor. Good knowledge will affect health behavior in improving health, especially dental and oral health (Romano et al., 2020).

Various efforts to prevent and improve health regarding cases of periodontal disease, the level of knowledge about periodontal disease is very important to be given from a young age (Almabadi et al., 2021). The limited knowledge about periodontal disease in most people is one of the causes of the low awareness to check themselves early (Astuti et al., 2021).

### Conclusions

Based on the results of the study, it can be concluded that there is a significant relationship between knowledge about periodontal disease and OHI-S on periodontal disease

### Conflict of Interest

The author hereby declares no conflict of interest.

### Ethical Clearance

The study was conducted after obtaining approval from the Ethics Committee of the Health Polytechnic of the Ministry of Health Yogyakarta No. e-KEPK/POLKESYO/0304/III/2021

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