

LEVEL OF KNOWLEDGE ABOUT THE DANGER OF SMOKING ON PERIODONTAL HEALTH AMONG SMOKERS

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ABSTRACT

Smoking habits in Indonesia is one of the health problems and becomes a socially complex problem. Nicotine content in cigarettes can damage the immune response system and cause constriction of blood vessels, including the blood vessel in the tissue around the teeth. This condition can increase pocket depth, alveolar bone loss, and tooth loss. The aim of this study was to explain the level of knowledge about the danger of smoking in smokers at Sriamur Health Center of Bekasi Regency. This study was a descriptive study with a cross-sectional design. The total samples were 100 smokers at Sriamur Health Center of Bekasi Regency. Data collection was conducted using questionnaires in Google Form. The statistical test used was univariate. The results of the study obtained those smokers at Sriamur Health Center of Bekasi Regency age 24-34 years with male at 85% and female 15%. 1% of the smokers had a low knowledge about the danger of smoking to periodontal health, 50% had a moderate knowledge, and 45% had a high knowledge. The conclusion from this study was level of knowledge about the danger of smoking on periodontal health in smokers at Sriamur Health Center of Bekasi Regency had a good knowledge.

Keywords: knowledge, smoking, periodontal health

INTRODUCTION

Smoking is a common and socially complex issue, with the number of smokers worldwide reaching 1.2 billion people, with 800 million developing countries. Indonesia is the largest producer of tobacco leaves and ranks third in male smokers and 17th for female smokers. (Kementerian Kesehatan RI, 2022; Putisari et al., 2014; Rompis et al., 2019; Widhani et al., 2022; World Health Organization, 2021) The increase in cigarette consumption in Indonesia has been attributed to household income, population growth, and education levels.⁴ Indonesia, particularly in the West Java area, has the third largest number of smokers after Bengkulu and Lampung Province. Bekasi regency, a supporting district in West Java Province, has the highest percentage of smokers in the age range of 25-34 years. (Badan Pusat Statistik Indonesia, 2019, 2021; Kementerian Kesehatan RI, 2018, 2020) Increased cigarette consumption has led to higher disease burden and increased death rates, with an estimated death rate from smoking reaching 70% in 2030. (Kementerian Kesehatan RI, 2020, 2022)

Cigarettes contain over 4,000 toxins, including poisons like carbon monoxide, toxic substances like oxidant radicals, carcinogenic substances like nitrosamines, and psychoactive addictive substances like nicotine. Smoking can increase the risk of developing all diseases and develop into various pathological conditions that cause death. Nicotine in cigarettes can damage the immune response system and cause narrowing of blood vessels, including blood vessels in the tissue around the teeth. This can cause a decrease in oxygen in the tissue and damage the immune response system, creating a favorable environment for the growth of periodontal-causing bacteria. (Suryana & Restuti, 2017)

Periodontal disease is a chronic infectious disorder caused by certain bacteria, and in Indonesia, as many as 74.1% of people suffer from periodontal disease. The most common features of periodontal diseases are increased pocket depth, alveolar bone loss, and tooth loss. Periodontal disease has two forms: gingivitis and periodontitis. Gingivitis is a reaction of the gingival tissue to the accumulation of dental plaque biofilm, while periodontitis is inflammation of the tissue supporting the teeth, accompanied by loss of connective tissue attachment and damage to the supporting bone (alveolar bone). (Kementerian Kesehatan RI, 2018; Könönen et al., 2019; Suratri & Notohartoyo, 2016) Aim of this study aim was to investigate changes in the form of knowledge in the target group regarding the dangers of smoking on periodontal health in controlling and maintaining periodontal health. This study was conducted at the Sriamur Community Health Center, Bekasi Regency, to understand the level of knowledge of the dangers of smoking on periodontal health among smokers.

METHOD

The type of research used in this study was descriptive, with a cross-sectional research design. This research was conducted at the Sriamur Community Health Center, Bekasi Regency from May 2023 to June 2023. The inclusion criteria for this study were female and male patients aged 24-34 years who smoked and received treatment at the Sriamur Community Health Center. In addition, eligible participants must have a smoking history of at least 12 months and be willing to become research subjects by providing informed consent and filling out a questionnaire form. In contrast, exclusion criteria included individuals who agreed to informed consent but did not complete the questionnaire or completed the questionnaire form despite agreeing to participate in the study. The population in this study were smokers at the Sriamur Community Health Center, Bekasi Regency. The sampling technique used in this study was non-probability sampling with a purposive sampling technique, namely determining the number of samples that fall within the predetermined inclusion and exclusion criteria, namely smoking patients at the Sriamur Community Health Center, Bekasi Regency who have smoked for at least 12 months, aged 24-34 years, and willing to be a research sample. Sampling used the Lemeshow formula because the population size was unknown, therefore the Lemeshow formula was used. The number of samples in this study was 100 respondents.

This study was carried out by creating a questionnaire to assess knowledge of the dangers of smoking on periodontal health at the Sriamur Community Health Center. The questionnaire was given via Google Form, and electronic media such as computers, cell phones and laptops were used for distribution. The data was then coded, tabulated, entered and processed using SPSS software. Univariate analysis tests were carried out, calculating one variable using descriptive and computerized statistics to calculate frequencies and percentages.

RESULTS AND DISCUSSION

This research was conducted on smokers at the Sriamur Community Health Center, Bekasi Regency in June 2023. The number of research subjects was 100 respondents who were included in the inclusion and exclusion criteria. Data collection was carried out by distributing questionnaires via Google form online regarding the level of knowledge of the dangers of smoking on periodontal health in smokers. The questionnaire is grouped into two parts, namely the first part regarding the respondent's identity such as name, age, gender. The second part of questionnaire was to measure the level of knowledge regarding periodontal health in smokers which consisted of 13 questions, for answers that were not given a score of 1, answers that did not know were given a score of 2, and answers for yes that were given a score of 3.

Out of 100 research subjects, table 1 indicates that 85 were male smokers (85%) and 15 were female smokers (15%).

Table 1. Frequency Distribution of Respondents Based on Gender

Gender	n	%
Male	85	85.0
Female	15	15.0
Total	100	100.0

Based on age, the research subjects consisted of 19 people aged 24 years (19%), 7 people aged 25 years (7%), 4 people aged 26 years (4%), 3 people aged 27 years (3%), 3 people aged 28 years old (3%), 8 people aged 29 years (8%), 9 people aged 30 years (9%), 6 people aged 31 years (6%), 5 people aged 32 years (5%), 3 people aged 33 years old (3%), 8 people aged 34 years (8%), 3 people aged 35 years (3%), 6 people aged 36 years (6%), 3 people aged 37 years (3%), and 13 people 38 years old (13%), as seen on table 2.

Table 2. Frequency Distribution of Respondents Based on Age

Age (year)	n	%
24	19	19.0
25	7	7.0
26	4	4.0
27	3	3.0
28	3	3.0
29	8	8.0
30	9	9.0
31	6	6.0
32	5	5.0
33	3	3.0
34	8	8.0
35	3	3.0
36	6	6.0
37	3	3.0
38	13	13.0
Total	100	100.0

It appears that there are 10 smokers with an elementary school education (10%), 10 smokers with a junior high school education (10%), high school consisting of 60 people (60%), D3 consisting of 3 people (3%), S1 consisted of 11 people (11%), and smokers with a final education of S2/S3 consisted of none (0%) (table 3).

Table 3. Frequency Distribution of Respondents Based on Last Education

Last Education	n	%
Elementary School	10	10.0
Junior High School	10	10.0
Senior High School	66	66.0
Diploma 3 (D3)	3	3.0
Bachelor (S1)	11	11.0
Master/Doctoral (S2/S3)	0	0.0
Total	100	100.0

In this study, there were 15 questionnaires regarding the respondent's knowledge of periodontal health. The frequency distribution of respondent’s knowledge of periodontal health answers can be seen in table 4 to table 6.

Question about ‘what is not one of the main toxins in cigarettes?’, it was known that 55 people (55%) answered ‘nicotine’, 13 people (13%) ‘carbon monoxide’, and 55 people (55%) ‘carbon dioxide’, as seen in table 4.

Table 4. Frequency Distribution of Respondents' Knowledge About Main Toxin in Cigarettes

Respondent’s Answer	n	%
What is not one of the main toxins in cigarettes?	100	
Nicotine	55	55.0
Carbon Monoxide	13	13.0
Carbon Dioxide	32	32.0

For question ‘carbon monoxide as one of the dangerous substances in cigarettes has the following properties’, the respondent’s answer was 17% answered that it ‘had no taste’, 52% answered ‘had a smell’, and 31% answered ‘at normal temperature it forms a colorless gas’ (table 5).

Table 5. Frequency Distribution of Respondents' Knowledge About Properties of Carbon Monoxide

Respondent's Answer	n	%
Carbon monoxide as one of the dangerous substances in cigarettes has the following properties:	100	
Had no taste	17	17.0
Had a smell	52	52.0
At normal temperature it forms a colorless gas	31	31.0

Below is table 6 that showed the respondent's answers to the remaining questionnaires.

Table 6. Frequency Distribution of Respondents' Knowledge of Periodontal Health in Questions Number 1-13

Question	Respondent's Answer					
	No		Didn't know		Yes	
	n	%	n	%	n	%
1. In your opinion do cigarettes contain dangerous chemicals?	7	7.0%	9	9.0%	84	84.0%
2. In your opinion, are cigarettes harmful to health?	7	7.0%	3	3.0%	90	90.0%
3. Did you know that smoking can affect dental and oral health?	4	4.0%	6	6.0%	90	90.0%
4. Did you know that cigarettes can cause bad breath?	5	5.0%	5	5.0%	90	90.0%
5. Did you know that cigarettes can cause tooth discoloration?	4	4.0%	6	6.0%	90	90.0%
6. Did you know that cigarettes can cause ulcer?	11	11.0%	15	15.0%	74	74.0%
7. Did you know that cigarettes can cause oral cancer?	10	10.0%	16	16.0%	74	74.0%
8. Did you know that cigarettes can cause plaque deposits and tartar?	7	7.0%	35	35.0%	58	58.0%
9. Did you know that cigarettes can cause gum disease?	19	19.0%	38	38.0%	43	43.0%
10. Did you know that cigarettes can cause gum bleeding?	31	31.0%	39	39.0%	30	30.0%
11. Did you know that cigarettes can cause tooth mobility?	29	29.0%	44	44.0%	27	27.0%
12. Did you know that cigarettes can cause tooth loss?	27	27.0%	48	48.0%	25	25.0%
13. Are you undergoing treatment for gum disease, if yes, did you know that cigarettes slow down the treatment for gum disease you are undergoing?	29	29.0%	44	44.0%	27	27.0%

The results of this research regarding the level of knowledge of respondents about periodontal health showed that the dominant knowledge of respondents has a high level of knowledge 45 respondents (45%), moderate 50 respondents (50%), and low level of knowledge only 1 (1%) (table 7).

Table 7. Frequency Distribution of Respondents' Level of Knowledge Regarding Periodontal Health

Level of Knowledge	n	%
Low	1	1.0
Moderate	50	50.0
High	45	45.0

This study aimed to assess the knowledge level of smokers at the Sriamur Community Health Center, Bekasi Regency, regarding periodontal health. The majority of respondents were male smokers aged 24-34 years, with a good level of education. Knowledge about cigarettes is closely related to smoking behavior, as it involves understanding the contents, dangers, and impacts of cigarettes. (Lianzi & Pitaloka, 2014; Soekidjo Notoatmodjo, 2010)^{13,14}

From this study it was found that 84% of respondents knew about the dangerous chemicals in cigarettes, and 55% of respondents correctly answered questions about the main toxins and the nature of carbon monoxide. Long-term consumption of cigarettes is a risk factor for various non-communicable diseases, such as lung disease, heart disease, and cancer. Smoking is also a risk factor for periodontal disease, as the ingredients in cigarettes can reduce blood flow, oxygen, and nutrients to the gingiva, making the gingiva susceptible to bacterial infections.¹⁵⁻¹⁶ The results showed that 90% of respondents knew that cigarettes are dangerous for health and can affect dental and oral health. This level of knowledge is high, as per research by Julaecha & Wuryandari, (2021); Rompis et al., (2019); Sinaga et al., (2014)

This study also found that 90% of respondents knew that cigarettes can cause bad breath and discoloration of teeth, which aligns with research by Sinaga et al., (2014). Additionally, 74% of respondents knew that cigarettes can cause mouth ulcers and mouth cancer, which aligns with Shimpi et al., (2018) research on patient knowledge and awareness about tobacco and alcohol consumption as an increase in the risk of oral cancer.

Tobacco has many chemicals that can be absorbed on the mucosal surface and enamel layer of smokers' teeth, leading to calculus. The high tar content in cigarettes cause tooth staining, rough tooth surface, and accelerate plaque accumulation on the teeth.(Adji, 2018; Prasetyowati et al., 2022) The results showed that 58% of respondents knew that cigarettes can cause plaque and tartar deposits. However, 35% of respondents did not know, and 2 respondents (2%) did not. This study highlights the importance of understanding the potential risks associated with smoking and its impact on dental and oral health. By providing information about the dangers of smoking and its potential health risks, smokers at the Sriamur Community Health Center can take steps to improve their oral and overall health.

Research by Rahmadani & Hutagalung (2022) found no relationship between the knowledge of active smokers and tooth stains and calculus in students, as students with good knowledge did not necessarily implement dental and oral health examinations, leading to poor oral hygiene scores. Poor oral condition is directly related to poor general health, and periodontal diseases such as alveolar bone loss, pocket formation, and tooth mobility are usually unknown. Knowledge and awareness of periodontal diseases are crucial for controlling and maintaining health periodontal.

Respondents from this study had good knowledge of periodontal health. However, the level of knowledge varies among respondents. Muniandy (2019) found that 78.5% of respondents agreed that smoking causes periodontal disease, due to efforts made by local bodies in health education and counseling campaigns.

Ashwin (2015) found that 95.7% of subjects knew that smoking had a bad impact on dental and oral health, but only 4.3% knew that smoking caused periodontal disease. Overall, the level of knowledge of respondents is good, but still need a program which focusing on knowledge and awareness of the bad effects of smoking on oral and periodontal health care. Educational programs regarding sustainable dental health campaigns and awareness programs about the relationship between smoking and periodontal disease have to be carried out periodically to strengthen public knowledge and motivate people to quit smoking. Dentists play an important role in educating and informing patients about the negative effects of smoking and motivating them to quit the habit. (Agrawal et al., 2022)

CONCLUSION

Based on the results and discussion of this study, it can be concluded that the description of the level of knowledge of the dangers of smoking on periodontal health in smokers at the Sriamur Health Center, Bekasi Regency, shows good results.

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REFERENCES

Adji, A. (2018). Analisis Risiko Pajanan Benzena Terhadap Kesehatan Pekerja Bahan Kimia Di Perusahaan Minyak Dan Gas Bumi PT. A. *IDENTIFIKASI*, 1(2), 1–20.

- Agrawal, C., Sharma, T., & Kikani, A. (2022). Assessment of Knowledge and Awareness about Periodontal Health in Smoker Patients: A Questionnaire Study. *Journal of Health Sciences & Research*, 12(2), 31–33. <https://doi.org/10.5005/jp-journals-10042-1109>
- Ashwin, C. S. (2015). Patients awareness of the relationship between smoking and periodontal diseases in Kingdom of Saudi Arabia. *Journal of Dentistry and Oral Hygiene*, 7(5), 60–63. <https://doi.org/10.5897/JDOH2015.0149>
- Badan Pusat Statistik Indonesia. (2019). *Badan Pusat Statistik: Presentase Penduduk Usia ≥ 15 yang Merokok dalam Sebulan Terakhir Menurut Kabupaten Kota dan Kelompok Umur*. <https://bekasikab.bps.go.id/statictable/2021/06/21/1786/persentase-penduduk-usia-15-tahun-ke-atas-yang-merokok-dalam-sebulan-terakhir-menurut-kabupaten-kota-dan-kelompok-umur-2019.html>
- Badan Pusat Statistik Indonesia. (2021). *Persentase Merokok Pada Penduduk Umur ≥ 15 Tahun Menurut Provinsi (Persen), 2021-2023*. <https://www.bps.go.id/id/statistics-table/2/MTQzNSMy/persentase-merokok-pada-penduduk-umur---15-tahun-menurut-provinsi--persen-.html>
- Julaecha, J., & Wuryandari, A. G. (2021). Pengetahuan dan Sikap tentang Perilaku Merokok pada Remaja. *Jurnal Akademika Baiturrahim Jambi*, 10(2), 313. <https://doi.org/10.36565/jab.v10i2.337>
- Kementerian Kesehatan RI. (2018). *Laporan Nasional RISKESDAS 2018*. Lembaga Penerbit Badan Penelitian dan Pengembangan Kesehatan. <https://repository.badankebijakan.kemkes.go.id/id/eprint/3514/1/Laporan%20Riskasdas%202018%20Nasional.pdf>
- Kementerian Kesehatan RI, I. P. D. dan I. K. K. R. (2022). *Perilaku Merokok Masyarakat Indonesia*. <https://www.kemkes.go.id/folder/view/01/structure-publikasi-pusdatin-info-datin.html>
- Kementerian Kesehatan RI, I. P. D. dan I. K. K. R. (2020). *Situasi Umum Konsumsi Tembakau di Indonesia*. <https://www.kemkes.go.id/folder/view/01/structure-publikasi-pusdatin-info-datin.html>
- Könönen, E., Gursoy, M., & Gursoy, U. (2019). Periodontitis: A Multifaceted Disease of Tooth-Supporting Tissues. *Journal of Clinical Medicine*, 8(8), 1135. <https://doi.org/10.3390/jcm8081135>
- Lianzi, I., & Pitaloka, E. (2014). Hubungan Pengetahuan Tentang Rokok Dan Perilaku Merokok Pada Staf Administrasi Universitas Esa Unggul. *Jurnal Inohim*, 2(1), 67–81.
- Muniandy, S. (2019). Knowledge on smoking and periodontal disease: A cross-sectional survey among targeted respondents. *Journal of Indian Society of Periodontology*, 23(3), 275. https://doi.org/10.4103/jisp.jisp_479_18
- Prasetyowati, S., Puspitasari, E. P., & Soesilaningtyas, S. (2022). SYSTEMATIC LITERATURE REVIEW: PENGARUH KEBIASAAN MEROKOK TERHADAP PENYAKIT JARINGAN PERIODONTAL PADA MASYARAKAT DI INDONESIA. *Jurnal Kesehatan Gigi Dan Mulut (JKGM)*, 4(1), 35–39. <https://doi.org/10.36086/jkgm.v4i1.884>
- Putisari, Hapsari, D., Khadijah, & Tarigan, I. (2014). Konsumsi Tembakau. In *Tobacco Control Support Centre-IAKMI. Bunga Rampai Fakta Tembakau dan Permasalahannya di Indonesia 2014* (5th ed., Vol. 1, pp. 23–39). Tobacco Control and Support Center - IAKMI.
- Rahmadani, L., & Hutagalung, M. H. P. (2022). Hubungan tingkat pengetahuan perokok aktif terhadap pembentukan stain serta kalkulus pada mahasiswa yang merokok. *Buletin Kedokteran Dan Kesehatan Prima*, 1(1), 26–29.
- Rompis, K., Wowor, V. N. S., & Pangemanan, D. H. C. (2019). Tingkat Pengetahuan Bahaya Merokok bagi Kesehatan Gigi Mulut pada Siswa SMK Negeri 8 Manado. *E-CliniC*, 7(2). <https://doi.org/10.35790/ecl.v7i2.24023>
- Shimpi, N., Jethwani, M., Bharatkumar, A., Chyou, P.-H., Glurich, I., & Acharya, A. (2018). Patient awareness/knowledge towards oral cancer: a cross-sectional survey. *BMC Oral Health*, 18(1), 86. <https://doi.org/10.1186/s12903-018-0539-x>
- Sinaga, C. P. A., Lampus, B. S., & Mariati, N. W. (2014). GAMBARAN PENGETAHUAN STAIN GIGI PADA PEROKOK DI KELURAHAN BAHU LINGKUNGAN V. *E-GIGI*, 2(2). <https://doi.org/10.35790/eg.2.2.2014.5761>
- Soekidjo Notoatmodjo. (2010). Ilmu Perilaku Kesehatan. *Jakarta: Rineka Cipta*, 200, 26–35.
- Suratri, M. A. L., & Notohartoyo, I. T. (2016). Smoking as a risk factor of periodontal disease. *Health Science Journal of Indonesia*, 7(2). <https://doi.org/10.22435/hsji.v7i2.5476.107-112>
- Suryana, A. L., & Restuti, A. N. S. (2017). Nitric Oxide Pada Perokok dan Bukan Perokok. *Jurnal Kesehatan Politeknik Negeri Jember*, 6–10.
- Widhani, F. D. P., Nosartika, I., Kusuma, I. A., & Prabowo, Y. B. (2022). Relationship between Knowledge of Periodontal Disease and Gingival Melanin Pigmentation and Smoking Behavior. *E-GiGi*, 10(1), 24. <https://doi.org/10.35790/eg.v10i1.37333>
- World Health Organization. (2021). *Global Adult Tobacco Survey: Indonesia Report*. <https://www.who.int/publications/m/item/2021-gats-fact-sheet-indonesia>