

Public knowledge about smoking as a triggering factor for oral cavity cancer

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ABSTRACT

Smoking habits in Indonesia are still very high. Approximately 80-90% of oral cancers are caused by smoking, cigars, pipes, and chewing gum. Ignorance of the negative impacts of smoking is considered to be the root of this contradictory situation. The purpose of this study was to determine how the knowledge of rural communities about smoking as a cause of oral cancer has changed. This study aimed to determine how the knowledge of rural communities about smoking as a triggering factor for oral cancer. This study was descriptive and observational with a cross-sectional design. Respondents totaling 171 residents of Margaluyu Village, Pangalengan District, Bandung Regency were selected based on inclusion and exclusion criteria. Data were collected using questionnaires completed during the study and processed using SPSS. The study showed that the majority of residents had low knowledge about smoking as a triggering factor for oral cancer. This can be seen from 92.4% of respondents having a score below 55%, 6.4% of respondents having a sufficient score of 56% - 74%, and 1.2% of respondents having a score above 75%. This study concludes that in Margaluyu Village, Pangalengan District, Bandung Regency, public knowledge about cigarettes as a cause of oral cancer is generally still low.

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INTRODUCTION

The World Health Organization (WHO) states that cancer is a disease that attacks adjacent parts of the body or spreads to other organs (Purba & Banjarnahor, 2025),(Rahayuwati et al., 2020). Cancer is a group of diseases characterized by uncontrolled cell growth accompanied by abnormal proliferation caused by external or internal factors. According to data from the Global Burden of Cancer in 2018, it is estimated that there were around 354,864 new cases of oral cancer and 177,384 deaths due to oral cancer. 1,2,3 Oral cancer is a malignancy in the lip area, oral cavity, oropharynx,

hypopharynx, gingiva, tongue, and all other oral mucosa, but does not include cancer of the nasopharynx and major salivary glands (Ardhiansyah, 2023),(Permasutha, 2021). Oral cancer cases are more common in men. In 2018, the prevalence of oral cancer in men was 246,420 cases and in women 108,444 cases. 2,4 Cases of oral cancer in Indonesia were reported to have reached 5,078 cases and 2,326 deaths due to oral cancer. According to the 2018 Basic Health Research (Riskesmas), the incidence of oral cancer in Indonesia was 5.6% of all cancer cases and 0.1%. 5 (Amtha et al., 2022),(Pramesti et al., 2024).

The main risk factors for oral cancer are alcohol consumption, smoking, human papillomavirus infection, betel quid chewing, and smokeless tobacco (Dohude & Audria, 2022),(Ridzuan, 2009)It is known that 29.8% of the Indonesian population smokes, 3.3% drink alcohol, and 33.8% use smokeless tobacco. Individuals who do not quit smoking after undergoing oral cancer therapy are at risk of recurrence. 4,5 (Salsabila et al., 2022),(Cindy Vania Kristanto & Stephanie Lowis Putri, 2025).

The primary cause of oral cancer is tobacco use. Approximately 80-90% of oral cancers are caused by smoking cigarettes, cigars, pipes, and chewing tobacco. This is because all tobacco products contain toxic substances, carcinogens (cancer-causing agents) and nicotine (an addictive substance), so all tobacco products are associated with an increased risk of oral cancer, namely cigarettes, cigars, pipes, and chewing tobacco (Prayoga, nd),(Hermawati et al., 2023). In addition, age, gender, lower socioeconomic status, lack of fruit and vegetable consumption, exposure to ultraviolet light, poor oral hygiene, and chronic wounds caused by dentures are some of the known risk factors for oral cancer (Oktalevia & Purnamasari, 2025),(Febriani, 2022).

Smoking is a habit that has significant health impacts. The WHO states that smoking not only has systemic effects but can also lead to pathological conditions in the oral cavity (Fadillah & Haryani, 2022),(Adiba & Arsanti, 2023). Teeth and soft tissues of the oral cavity are areas that can be damaged by smoking. Periodontal disease, caries, tooth loss, gingival recession, precancerous lesions, oral cancer, and implant failure are all conditions that can arise from smoking (Tiatanti, 2023),(Lestari, 2025).

Smoking is a common habit in Indonesia. Survey data shows that the prevalence of smoking in Indonesia continues to increase annually, among both men and women (Suri et al., 2023),(Listyorini, 2023). The prevalence of smoking in the population aged ≥ 15 years who smoke tends to increase, this can be seen from the Riskesdas data in 2007 at 34.2%, in 2010 at 34.7% and in 2013 to 36.3%. 9 Cigarettes are one of the tobacco products that are intended to be burned and inhaled, including clove cigarettes, white cigarettes, cigars or other forms produced from the *Nicotiana tabacum*, *Nicotiana rustica* plants, and other species or synthetics whose smoke contains nicotine and tar. 10 White cigarettes contain 14-15 mg of tar and 5 mg of nicotine while clove cigarettes contain around 20 mg of tar and 44-45 mg of nicotine(Puspasari, 2024).

Knowledge is the result of a person's knowledge of an object through their senses, including sight, hearing, smell, taste, and touch. Research conducted by Novitasari states that factors that can influence knowledge include age, education, occupation, experience, interests, environment, and information (So'o et al., 2022). Adolescents' knowledge of cigarette ingredients and the potential impacts and dangers they can cause to teeth and mouth can influence their smoking habits. Respondents' knowledge of the health risks of smoking can also be developed through non-formal education at home, as it is common for parents to forbid their children from smoking, even for various reasons (Santi & Karliana, 2024).

Knowledge is one factor that can influence health status, including dental health. Public knowledge and awareness of the importance of dental and oral hygiene due to smoking are still very low. This is demonstrated by the continued high number of people who smoke. The causes are low knowledge, social interactions, easy access to cigarettes, and cultural influences, all of which will impact dental and oral health (Nurlina, 2024). Knowledge influences a person's attitude about smoking. Lack of knowledge about the dangers of smoking tends to cause someone to smoke

and has an impact on continuing smoking, because smoking is considered not to pose a health risk. The results of statistical tests in this study showed a p-value ($0.000 < 0.05$), meaning there is a relationship between the level of knowledge and the motivation to quit smoking. This indicates that the higher the level of knowledge, the higher the motivation to quit smoking (Nia et al., 2022).

Margaluyu Village is a rural area with a majority of adults who are active smokers and have a low level of education so that residents are less aware of the impact of continued smoking.¹⁷ The lack of research conducted in Margaluyu Village, especially regarding dental and oral health, as well as education and socialization applied to the surrounding community, is the reason for conducting this research, namely to determine the community's knowledge about smoking as a risk factor for oral cancer and it is hoped that the data obtained can be useful and used by dental clinicians.

RESEARCH METHOD

This study is a descriptive observational study with a cross-sectional design. Data collection was conducted through a survey using two methods: direct questionnaires and Google Forms. The research population was the residents of Margaluyu Village starting from adolescence, totaling 6,120. Samples were taken from each age range referring to the Ministry of Health in 2009. The minimum sample was obtained from calculations using the Slovin formula, resulting in 171 respondents.

Data processing techniques in this study include: editing, coding, scoring, and tabulation. Data processing techniques were carried out using computational calculations in the SPSS 23 (Statistical Product and Service Solution) program. The analytical method used in this study is descriptive analysis, this method is used to examine the variables in the study, namely the level of community knowledge (X) and risk factors for oral cancer in Margaluyu Village (Y).

This research has been submitted to the Research Ethics Commission of the Faculty of Dentistry, Maranatha Christian University, taking into account the basic principles of research ethics, namely: respect for persons, benefit (beneficence), not harming research subjects (non-maleficence), and justice.

RESULTS AND DISCUSSIONS

The majority of respondents based on age characteristics are in the age range of 17-25 years, amounting to 28.1% and the minority age is in the age range >65 years, amounting to 2.3%. The high number of respondents with an age range of 17-25 years provides an illustration that the indication of smoking behavior among the people of Margaluyu Village, Pangalengan District, Bandung Regency tends to be high. Late adolescence is psychologically a transitional stage towards adulthood so it is not surprising that during this period individuals will be more active in searching for identity so they will be more interested in trying new things such as smoking. Therefore, the smoking behavior of most people in Margaluyu Village, Pangalengan District, Bandung Regency is more due to curiosity to try new things that eventually become a habit.

The majority of respondents, based on gender characteristics, were male at 94.7%, and the remaining 5.3% were female. The high male prevalence from the gender analysis indicates that smoking tends to be more popular among men. This is due to rural environments where women consider smoking taboo, while smoking among men is considered normal behavior or does not violate social norms. The majority of respondents based on educational level characteristics were at the elementary school level, namely 46.8% and the minority education level was at the D III level, namely 2.3%. This illustrates that the people of Margaluyu Village, Pangalengan District, Bandung Regency tend to have poor access to information about the impact of smoking on health considering their low academic ability which has an impact on smoking behavior among the people of Margaluyu Village, Pangalengan District, Bandung Regency.

The majority of respondents, based on their occupational characteristics, were laborers (48.5%), and a minority were livestock breeders (2.3%). This illustrates that the workplace environment for farm laborers generally does not prohibit smoking during working hours, leading to a more dominant smoking behavior among respondents with laborer occupations. The high prevalence of laborers in the Margaluyu Village community, Pangalengan District, Bandung Regency, will certainly impact their ability to meet their financial needs, which can be said to be less than optimal. This is a major factor in people feeling stressed in meeting their living needs, so they resort to smoking as a way to relieve stress, as people consider it a calming activity.

The majority of respondents based on the characteristics of cigarette type were kretek cigarettes, namely 53.8% and the minority type of cigarette was filter cigarettes, namely 37.4%. This illustrates that the people of Margaluyu Village, Pangalengan District, Bandung Regency tend to be strong cigarette addicts so that when smoking filter cigarettes they are considered less noticeable. The choice of kretek cigarettes is also closely related to the geographical conditions of cold temperatures and the type of work as farm laborers, which are factors that encourage people to prefer kretek cigarettes because they are considered more delicious and more economical than filter cigarettes. Smoking is the act of inhaling tobacco and exhaling smoke through the mouth and nose. Smoking is closely related to the environment, as it is a repetitive activity and generally accepted by society. To measure smoking habits in Margaluyu Village, Pangalengan District, Bandung Regency, five questions were used.

Discussion

Based on Figure 1, it can be seen that the people of Margaluyu Village, Pangalengan District, Bandung Regency tend to have a high smoking habit, this can be seen from the community's smoking habits at every moment. The majority of smoking behavior occurs after eating, namely 81.9% and the minority smoking behavior occurs when gathering with family, namely 59.1%. Smoking behavior after eating is the highest smoking behavior carried out by respondents, because the body's metabolism and hepatic blood flow rate increase when eating, thereby reducing nicotine levels from the body. The reduced nicotine levels in the body encourage individuals to smoke to restore these nicotine levels, therefore respondents tend to smoke after eating because it is considered more enjoyable.

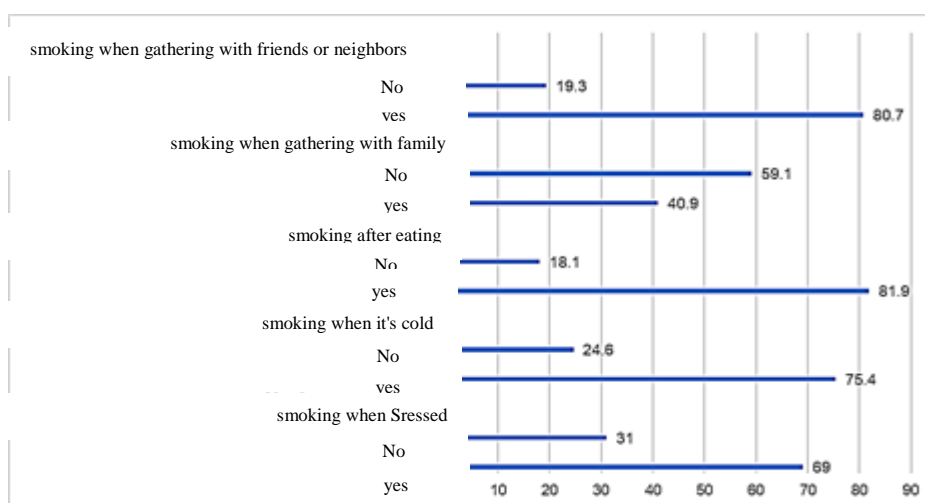


Figure 1. Respondents' answers regarding smoking habits

Knowledge about the dangers of smoking is closely related to the environment and norms held by an individual or group, which in turn impacts their behavior. Knowledge aligns with the

intensity of attention paid to an object, resulting from the sensory process. The knowledge of the people of Margaluyu Village, Pangalengan District, Bandung Regency, was measured using six questions.



Figure 2. Respondents' answers regarding knowledge of the dangers of cigarettes

Based on Figure 2, it can be seen that the people of Margaluyu Village, Pangalengan District, Bandung Regency tend to have low knowledge, this is seen from the tendency of people to provide inappropriate answers to research questions with srok. In general, the low knowledge of respondents was found in the question of inhaled cigarette smoke being harmful to health where incorrect answers reached 95.9% and a minority answer was found in the question of clove cigarettes being more dangerous to oral and dental health with incorrect answers of 74.9%. This illustrates that the people of Margaluyu Village do not have knowledge related to the dangers of cigarette smoke that can impact oral and dental health, even most people of Margaluyu Village, Pangalengan District, Bandung Regency do not know that exposure to cigarette smoke contains dangerous substances. This lack of knowledge has an impact on the assessment of cigarettes, which in general all types of cigarettes are considered not to affect oral and dental health and exposure to cigarette smoke inhaled by others is not harmful to health. The large number of people who do not know about the level of danger of cigarettes shows that people have never received information about the dangers of cigarettes, either intentionally, such as through health socialization, or unintentionally, such as from health advertisements, so that most people think that cigarettes are not dangerous because they are not really inhaled, considering that cigarette smoke is released again when smoking.

Knowledge of triggers of oral cancer refers to the beliefs of the people of Margaluyu Village, Pangalengan District, Bandung Regency regarding the negative effects of smoking behavior which has become their habit, measurement of knowledge regarding smoking as a trigger of oral cancer is measured through three questions.

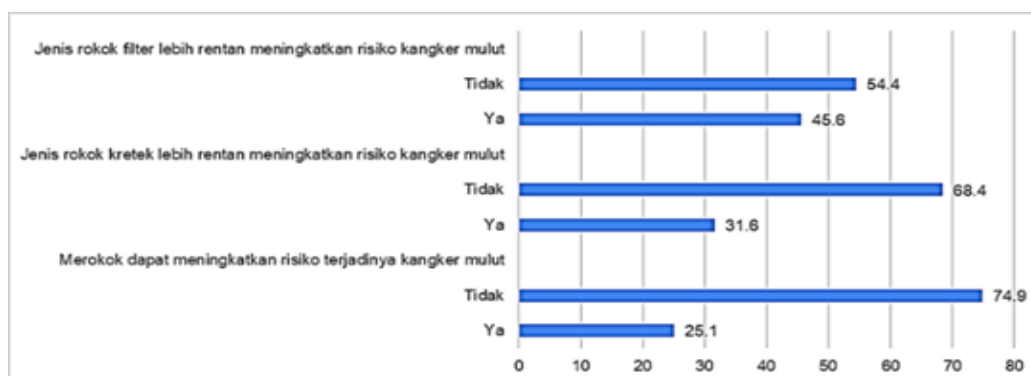


Figure 3. Respondents' answers regarding knowledge of triggering factors for oral cavity cancer

Based on Figure 3, it can be seen that the people of Margaluyu Village, Pangalengan District, Bandung Regency tend to have low knowledge regarding the triggers of oral cancer. This is seen from the community's answers which tend to be inaccurate in answering questions in the study. The majority of respondents' low knowledge was found in the question of smoking can increase the risk of oral cancer, where the incorrect answer reached 74.9% and the minority answer was in the question of filter cigarettes being prone to increasing the risk of oral cancer, with an incorrect answer of 54.4%. This illustrates that respondents are not aware of oral cancer because they have never received information about it. Oral and dental health complaints refer to conditions of declining oral and dental health that are often experienced by most individuals, but are considered trivial. In this study, oral and dental complaints were measured through the following six questions.



Figure 4. Respondents' answers regarding oral and dental health complaints

Based on Figure 4, it can be seen that the residents of Margaluyu Village, Pangalengan District, Bandung Regency tend not to experience oral and dental health complaints. The majority of complaints about oral and dental problems experienced by respondents were bleeding when brushing their teeth (41.5%), and a minority complaint was experiencing red or white spots that did not heal on their own (11.1%). The results of the descriptive analysis indicate that the highest oral and dental health complaint experienced by the residents of Margaluyu Village, Pangalengan District, Bandung Regency, was bleeding when brushing their teeth. Clinically, bleeding when brushing teeth is caused by inflammation or infection due to poor oral and dental hygiene and unhealthy behaviors such as smoking, which will exacerbate the problem. However, the complaint of bleeding when brushing teeth, according to respondents, is not the impact of smoking behavior, but rather caused by the type of hard food and brushing teeth too hard, which injures their gums. This belief is in line with the low level of public knowledge regarding the dangers of smoking because so far most people have not received information about the dangers of smoking, either formally or informally.

Overall, the knowledge of the people of Margaluyu Village, Pangalengan District, Bandung Regency is carried out through calculating the total score where the correct answer has a score of 1 and incorrect has a score of 0. Furthermore, from the total score, the percentage will be sought which is then entered according to the following categories according to Budiman (2013): (1) High knowledge ($\geq 75\%$); (2) Sufficient knowledge (56% - 74%); (3) Low knowledge ($\leq 55\%$). The results of the analysis of public knowledge about smoking as a triggering factor for oral cavity cancer are as follows.

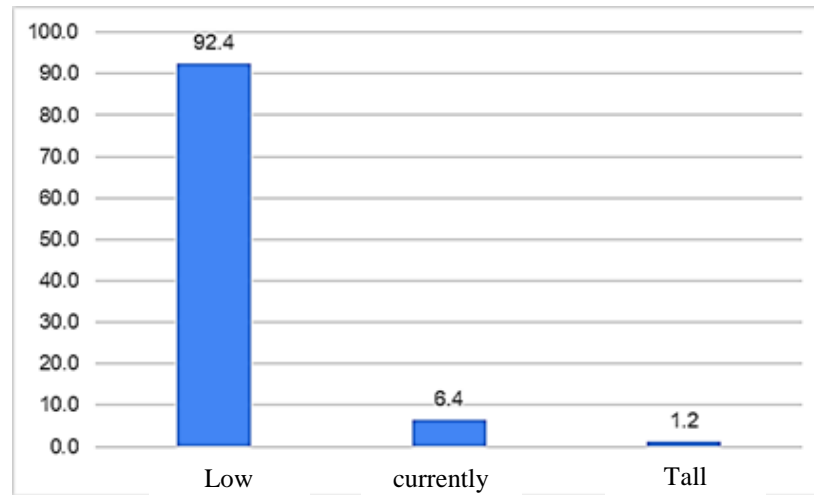


Figure 5. Respondents' answers regarding knowledge of smoking as a triggering factor for oral cavity cancer

Based on Figure 5, it can be seen that the majority of the people of Margaluyu Village, Pangalengan District, Bandung Regency have low knowledge about smoking as a triggering factor for oral cancer. This can be seen from 92.4% of respondents who scored below 55%, 6.4% of respondents had a sufficient score of 56% - 74%, and 1.2 respondents had a score above 75%. This illustrates that the people of Margaluyu Village, Pangalengan District, Bandung Regency have not received information regarding the dangers of smoking to health, so most people do not know that cigarettes contain substances that are harmful to health and that smoking can be a triggering factor for oral cancer.

Knowledge can be understood as the result of sensing an object or phenomenon, thus allowing one to remember material obtained from information. Sensing occurs through the five senses of sight, hearing, smell, taste, and touch, and some human knowledge is obtained through sight and hearing. Knowledge about smoking as a trigger for oral cancer is closely related to a person's age, education, and behavior. It is expected that the higher the age and education, the broader the person's knowledge and healthier lifestyle.

The results of the study indicate that knowledge of smoking as a triggering factor for oral cancer in the majority of residents of Margaluyu Village, Pangalengan District, Bandung Regency is in the low category. This low level of public knowledge regarding smoking as a triggering factor for oral cancer can be seen in the community's smoking habit, which occurs in almost every situation, especially after eating. Medically, smoking after eating is considered to interfere with the absorption of food nutrients because the body will absorb nicotine more quickly. However, this information was not conveyed to respondents, and even smoking after eating was considered more enjoyable, so that after eating, smoking behavior was almost unavoidable by respondents. This is in accordance with the results of Azzizah's research, which stated that there is a relationship between the level of knowledge and motivation to quit smoking.¹⁶

In addition to the respondents' high-intensity smoking habits, the respondents' low knowledge about smoking as a triggering factor for oral cancer can also be seen from their low knowledge of the dangers of smoking to health, especially regarding the information that inhaled cigarette smoke is dangerous for health. The people of Margaluyu Village, Pangalengan District, Bandung Regency, believe that inhaled cigarette smoke does not have a negative impact on health, especially oral and dental health because they feel that if the cigarette smoke is released again, it does not enter the body.

Furthermore, respondents' low knowledge of smoking as a trigger for oral cancer can be seen from their knowledge of triggering factors for oral cancer. Respondents believe that smoking does not increase the risk of oral cancer as long as oral and dental hygiene are maintained. This misperception is further reinforced by the low number of complaints related to oral and dental health experienced by respondents. The most common complaint experienced by respondents was bleeding when brushing their teeth, but this is not believed to be a negative impact triggered by smoking. Respondents believe that bleeding when brushing teeth is more caused by errors in brushing teeth.

Respondents' low knowledge about smoking as a trigger for oral cancer is closely related to their age and education level. In terms of age, the majority of respondents were teenagers, who at that time lacked experience, including information about the dangers of smoking. Experience is a learning process and the development of behavioral potential, both through formal and non-formal education. It can be interpreted as a process that leads someone to better behavioral patterns. Therefore, when young individuals tend not to have gone through many processes, their knowledge will be low due to the lack of information in their memory.

Besides age, education level is also closely related to knowledge because formal and informal educational activities focus on the teaching process, with the aim of changing behavior, namely from not knowing to knowing, from not understanding to understanding. Education is a learning process that means there is a process of growth, development, or change towards a more mature, better, and more mature individual. The results of the descriptive analysis showed that the majority of respondents' education level was elementary school, this provides an illustration that the ability to access information from respondents is still very limited so it is difficult to obtain information about the dangers of smoking which ultimately leads to low knowledge of respondents regarding smoking as a triggering factor for oral cancer.

CONCLUSION

Based on the analysis and descriptions described above, the conclusion of this study is that the knowledge of the people of Margaluyu Village, Pangalengan District, Bandung Regency, regarding smoking as a trigger for oral cancer tends to be low. Further research should investigate effective educational and training strategies to increase the participation of students, interns, and faculty members in oral cancer prevention activities.

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