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The Effectiveness of Gum and Mint Candy in Quitting Smoking in Adolescents

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ABSTRACT

Background: Smoking is a bad habit that can cause various diseases for a long-term period with high frequency. Adolescents are the nation's assets and are expected to have optimal health status. Thus, it is necessary to make efforts to quit smoking, such as the use of gum and mint candy as a substitute for cigarettes to reduce the number of cigarette consumption or even stop smoking behavior in adolescents. Objective: This study aimed to determine the differences in the effectiveness of chewing gum and mint candy on quitting smoking in adolescents. Methods: This was quantitative research with a quasi-experimental design. The sample was 62 students of SMK Ma'arif 1 Kroya who were selected through a simple random sampling method. Then, survey sheets and observation books were used as the instruments. Afterward, the data were analyzed using the Wilcoxon test and Mann-Whitney test. Results: The result of the Wilcoxon test indicated that the number of cigarette consumption before and after the gum intervention was 0.001. meanwhile, the number of cigarette consumption before and after the intervention of mint candy was 0.003. It meant that both were effective in qutting smoking efforts. In addition, the result of the Mann-Whitney test was 0.070. It meant no difference in the effectiveness of gum and mint candy on qutting smoking in adolescents. Conclusion: There was no significant difference between the gum and mint candy in quitting smoking cigarettes in the adolescent.

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1. INTRODUCTION

Smoking is burning one of the tobacco products intended to be smoked and inhaled, for example kretek cigarettes, white cigarettes, cigar cigarettes or other tobacco products originating from the nicotiana tabacum, nicotiana rustica and other types of which the smoke contains nicotine and tar with or without additives (Kemenkes RI, 2013). Adolescents are residents with an age range of 10 to 19 years. Adolescence is a period of change from childhood to adulthood marked by physiological, hormonal, emotional, social and psychological changes (Elpasa et al., 2021).

Among the Indonesian population aged 10 years 33.8% are tobacco users (62.9% men, 4.8% women) (Riskesdas, 2018). According to data from the Indonesian Central Statistics Agency, the percentage of smoking in the population aged 15 years in Central Java in 2019 was 27.40% then increased to 27.70% in 2020 and 28.24% in 2021. According to Riskesdas data in 2018, the population of Cilacap Regency aged 10 years who has a smoking

habit is 32.08%. Tobacco kills about 290,000 people every year. More than 52,000 deaths are caused by exposure to secondhand smoke. Tobacco causes 59.6% of deaths from tracheal, bronchial and lung cancer, 59.3% of deaths from chronic obstructive pulmonary disease, 28.6% of deaths from ischemic heart disease, 20.6% of deaths from diabetes mellitus, and 19.7% of deaths from stroke (Global Burden of Disease (GBD) 2019, 2021).

Based on these data, government efforts are needed to suppress the use of tobacco products. Therefore, the government made PP No. 109 of 2012 concerning the safety of materials containing addictive substances in the form of tobacco products for health. Some of the efforts listed in the regulation are the availability of smoke-free areas at various points, warning labels on cigarette packaging, prohibitions on selling tobacco products to residents aged 18 years and pregnant women, and so on. However, these efforts have not been effective so it is necessary to conduct research related to other efforts that can be made to reduce the number of cigarette consumption in adolescents to prevent the occurrence of diseases caused by smoking (PP RI No 109 Tahun 2012, 2012).

Chewing gum is a bolus that produces a mechanical stimulus that causes saliva production to increase. Taste buds are located on the tongue, which is the sensation of taste. The sweet taste of chewing gum is similar to a chemical stimulus received by the sense of taste, which activates the autonomic nervous system, which further increases salivary gland secretions (Guyton & Hall, 2014). The mouth contains sensory neurons containing a protein, namely the transient receptor potential cation channel subfamily M member 8 (TRPM8). Mint contains an organic compound called menthol which binds to TRPM8, this causes ion channels to open as if the receptors were exposed to cold and relays this information to the brain (Helmenstine, 2021).

This study uses the nursing theory proposed by Nola J. Pender, namely the Health Promotion Model Theory by providing an intervention, namely the consumption of chewing gum and mint on cigarette weaning in the adolescent age group in order to improve healthy living behavior and better quality of life (Nursalam, 2017).

A preliminary study was conducted by researchers on 10 male adolescent students aged 15-17 years who are active smokers. Most of the respondents know the dangers posed by smoking but continue to practice the habit on the grounds that it is delicious, delicious, addicted and because there is no activity. Some of them have experienced complaints of coughing and shortness of breath when doing strenuous activities. Respondents who have long had a smoking habit tend to spend more cigarettes per day, which is about 7-8 cigarettes. These data make researchers feel interested in conducting research related to "The Effectiveness of Chewing Gum and Mint Candy on Cigarette Weaning in the Adolescent Age group".

2. RESEARCH METHOD

This research is a quantitative research with a quasi-experimental design. The sample of this study was the students of SMK Ma'arif 1 Kroya with a total of 62 respondents who were selected through a simple random sampling method. The research instrument used a survey sheet that was distributed at the beginning of the study and an observation book filled in by respondents for 2 weeks undergoing intervention according to their respective groups. The data analysis used was the Wilcoxon test to determine the effectiveness of each intervention on smoking weaning and the Mann Whitney test to determine the difference in effectiveness between the two interventions given to each group.

3. RESULT AND DISCUSSIONS

Respondent Characteristics

Table 1. Characteristics of Respondents by Age, Age of First Smoking, Smokers in the Family, Types of Cigarettes Consumed, BMI and Health Status (n=62)

Category	n	%
Age (Year)		
15	26	41,9
16	30	48,4
17	6	9,7
First Age Smoking (Years)		
8-10	6	9,7
11-13	31	50
14-16	25	40,3
Smokers in the Family		
There is	53	85,5
There isn’t any	9	14,5
Types of Cigarettes Consumed		
Kretek Cigarettes	2	3,2
Category	**n**	**%**
Cigarettes Filter	60	96,8

	Cigar Cigarettes	0	0
BMI			
	Thin	38	61,3
	Normal	17	27,4
	Fat	7	11,3
Health Status			
	Healthy	60	96,8
	Sick	2	3,2

Based on Table 1, it can be seen that from the age range of respondents, namely 15-17 years, the highest number is 16 years old (48.4%). Based on the age at first smoking, the highest number was in the age range of 11-13 years (50%). Based on the presence of smokers in the family as many as 53 respondents (85.5%) have family members who have a smoking habit. Based on the types of cigarettes consumed, the highest number was filter cigarettes as many as 60 (96.8%). Based on the BMI which has the highest number is BMI below normal as many as 38 respondents (61.3%). Based on the health status that has the highest number of respondents with healthy conditions as many as 60 respondents (96.8%).

Physical Health Overview

Table 2. Description of respondents' physical health based on examination of SpO2, pulse, RR, salivary pH and lip color

Category		Frequency	Presentage (%)
SpO2			
	Normal	61	98,4
	Mild Hypoxia	1	1,6
	Moderate Hypoxia	0	0
	Severe Hypoxia	0	0
Pulse			
	Slow	0	0
	Normal	19	30,6
	Fast	43	69,4
Respiratory Rate			
	Slow	0	0
	Normal	40	64,5
	Fast	22	35,5
pH Saliva			
	Normal	26	41,9
	Abnormal	36	58,1
Lips colour			
	Normal	21	33,9
	Dark	41	66,1

Based on table 2, it can be seen that the SpO2 value which has the highest number is the normal value as many as 61 respondents (98.4%). Based on the pulse examination, the highest number was rapid pulse as many as 43 respondents (69.4%). Based on the respiratory or respiratory examination, the respondents with normal breathing were 40 respondents (64.5%). Based on the examination of salivary pH which has the most amount is below the normal value as many as 36 respondents (58.1%). Based on lip color examination, the respondents with dark lips were 41 respondents (66.1%).

The Effectiveness of Chewing Gum on Weaning Cigarettes in Teenage Age Groups

Table 3.1 Number of cigarette consumption before giving chewing gum intervention

Number of Cigarettes	N	Mean	Median	Modus	S.D	Min-Max
	31	4,58	5	6	1,34	2-6

Table 3.1 shows that of the 31 respondents the average number of cigarettes consumed before the mint candy intervention was given was 4.58. The minimum number of cigarette consumption is 2 and the maximum is 6.

Table 3.2 Total cigarette consumption after chewing gum intervention

Number of Cigarettes	N	Mean	Median	Modus	S.D	Min-Max
	31	3,74	4	3	1,36	1-6

Table 3.2 shows that of the 31 respondents the average number of cigarettes consumed before the mint candy intervention was given was 3.74. The minimum number of cigarette consumption is 1 and the maximum is 6.

Table 3.3 Analysis of changes in the amount of cigarette consumption before and after the chewing gum intervention

Number of Cigarettes	Decrease	Increase	Same	Total	p-*Value*
	19 (61,29%)	1 (3,23%)	11 (35,48)	31	0,001

Non-Parametric Wilcoxon statistical test on the number of cigarette consumption before and after the chewing gum intervention was given to 19 respondents out of 31 respondents or 61.29%. P-Value = 0.001 < = 0.05, which means Ha is accepted, meaning that there is a significant difference between the number of cigarettes consumed before and after the chewing gum intervention.

The Effectiveness of Mint Candy on Cigarette Weaning in Adolescent Age Group

Table 4.1 Amount of cigarette consumption before giving mint candy intervention

Number of Cigarettes	N	Mean	Median	Modus	S.D	Min-Max
	31	3,84	4	3	1,27	2-6

Table 4.1 shows that of the 31 respondents the average number of cigarettes consumed before the mint candy intervention was given was 3.84. The minimum number of cigarette consumption is 2 and the maximum is 6.

Table 4.2 Number of cigarette consumption after being given mint candy intervention

Number of Cigarettes	N	Mean	Median	Modus	S.D	Min-Max
	31	3,23	3	3	1,33	1-7

Based on table 4.2, it shows that of the 31 respondents the average number of cigarettes consumed after the mint candy intervention was 3.23. The minimum number of cigarette consumption is 1 and the maximum is 7.

Table 4.3 Analysis of changes in the amount of cigarette consumption before and after the mint candy intervention

Number of Cigarettes	Decrease	Increase	Same	Total	p-*Value*
	14 (45,16%)	2 (6,45%)	15 (48,39%)	31	0,003

Non-Parametric Wilcoxon statistical test on the number of cigarette consumption before and after the mint candy intervention was given to respondents who experienced a decrease in the number of cigarette consumption as many as 14 people from 31 respondents or 45.16%. P-Value = 0.003 < = 0.05, which means Ha is accepted, meaning that there is a significant difference between the number of cigarettes consumed before and after the mint candy intervention was given.

Differences in Effectiveness Between Chewing Gum and Mint Gum on Cigarette Weaning in Adolescent Age Groups

Table 5. Analysis of the Differences in the Effectiveness of Chewing Gum and Mint Candy

Group	Mean Rank	Sum of Ranks	p-*Value*
Chewing Gum	35,53	1101,50	0,070
Mint Candy	27,47	851,50	

Based on the Mann Whitney Non-Parametric statistical test, the p-Value (Asymp. Sig. 2-tailed) value was 0.070 (> 0.05) so it could be concluded that Ha was rejected, which means there was no difference in effectiveness between chewing gum and mint on weaning. smoking in the adolescent age group.

DISCUSSIONS

Characteristics of Respondents

Based on Table 1, it can be seen that from the age range of respondents, namely 15-17 years, the highest number is the age of 16 years as many as 30 respondents or 48.4%. According to the theory of growth and development proposed by Erik Erikson, the age range of 12-20 years is in the fifth stage, namely the phase of adolescence or adolescence. This phase is characterized by a tendency to identity-identity confusion as an effort

to prepare for adulthood. At this point, adolescents try to form and show their identity according to their abilities (Thahir, 2018).

Meanwhile, based on the age of first smoking, the highest number was in the age range of 11-13 years as many as 31 respondents or 50%. According to the theory of growth and development proposed by Erik Erikson, the age range of 6-11 years is the school age phase or the school period which is generally elementary school. This phase is marked by an industry-inferiority tendency, at this time children are very active in learning what is in their environment (Thahir, 2018).

Based on the presence of smokers in the family as many as 53 respondents or 85.5% have family members who have a smoking habit. This is in line with research conducted by Nainggolan et al., (2020) which shows that smoking behavior in adolescents aged 15-18 years is influenced by the presence of family members who have smoking habits.

Based on the types of cigarettes consumed, the highest number were filter cigarettes as many as 60 respondents or 96.8% and the rest consumed kretek cigarettes. The amount of nicotine contained in filter cigarettes is less than non-filtered cigarettes (Muliyana & Thaha, 2013).

Based on weight and height, which is then calculated BMI which has the highest number of respondents with a BMI below normal or can be said to be thin, as many as 38 respondents or 61.3%. In a study conducted by Bagaskoro & Amelia (2020) it is assumed that adolescents who have a smoking habit have an effect on health such as changes in nutritional status.

Based on health status, the respondents with the highest number of healthy conditions were 60 respondents or 96.8%. Healthy indicators used by researchers to classify respondents into healthy or unhealthy status are based on survey sheets that have been filled out by respondents regarding the presence or absence of current complaints.

Physical Health Overview

Based on Table 2 on the description of the physical health of the respondents, it can be seen that the SpO2 value which has the highest number is the normal value as many as 61 respondents or 98.4%. This is in line with research conducted by Kodir & Margiyati (2021) that the heavier the degree of smoking, the lower the oxygen saturation value even though it is still within normal limits.

Based on the pulse examination, the highest number is a pulse that is above normal or fast as many as 43 respondents or 69.4%. A person who has a smoking habit tends to have a higher resting heart rate when compared to someone who does not have a smoking habit (Sumartiningsih et al., 2019).

Based on the respiratory or respiratory examination, the respondents with normal breathing were 40 respondents or 64.5%. Average respiration is the number of breaths in one minute. The average respiration is grouped into normal, fast and slow, while the respiration characteristics include rhythm, depth of sound, and ease of breathing. In this study, most of the respondents' respiration rates were normal.

Based on the examination of salivary pH using saliva samples measured using a pH indicator, the highest number is abnormal salivary pH or below the normal value as many as 36 respondents or 58.1%. This is in line with research conducted by Qalbi et al., (2018) which states that smoking is one of the things that causes a decrease in salivary flow rate which also has an impact on a decrease in salivary pH.

Based on lip color examination, the respondents with dark lips were 41 respondents or 66.1%. This is in line with research conducted by Revien et al., (2020) which states that most smokers experience a disorder called melanosis (change in the color of gingival pigmentation).

The Effectiveness of Chewing Gum on Weaning Cigarettes in Adolescent Age Groups

Xylitol is a five carbon polyalcohol, xylitol is metabolized in the liver and converted to D-xylulose and glucose by polyol dehydrogenase. The degree of sweetness of xylitol is almost the same as that of sucrose. Oral bacteria, namely Streptococcus mutans, when in contact with xylitol, will form xylitol-5-phosphate, which can inhibit the glycolysis process (a process that results in the conversion of one glucose molecule into two pyruvate molecules). The habit of consuming xylitol gum as a substitute for cigarettes also has another advantage, namely it can reduce the accumulation of plaque on the teeth compared to people who do not have the habit of consuming xylitol gum (Guyton & Hall, 2014).

Chewing gum causes the chewing reflex to occur. Chewing gum is a bolus that can result in a mechanical stimulus that can stimulate an increase in salivary secretion, while the spicy taste sensation produced by chewing gum is a chemical stimulus that can increase salivary secretion. The tongue is the sense of taste that has taste buds. The sweet taste produced by xylitol gum is likened to a chemical stimulus received by the taste buds, which activates the autonomic nervous system which then stimulates the secretion of the salivary glands. Chewing gum movement is a mechanical activity, which involves the physiology of blood circulation, nerves, masticatory muscles, temporomandibular joints and teeth that participate in activating autonomic nerves to secrete saliva (Guyton & Hall, 2014).

One of the functions of saliva is as a buffer that can prevent a decrease in the pH value of saliva or an increase in acid in the mouth because it is related to viscosity (viscosity) or volume (Wirawan & Puspita, 2017).

Saliva is expelled at a flow rate of 20 ml/hour at rest, one of the things that can cause changes in the salivary flow rate is exposure to cigarette smoke. Stimuli given in the form of sweet, sour, spicy and bitter tastes will activate the speed of salivary secretion. Giving xylitol gum with the right dose on a regular basis can dilute the viscosity of saliva. The increase in salivary flow is directly proportional to the increase in pH levels in saliva and the buffering ability of saliva (Asmalinda et al., 2021).

Based on the description of the discussion above, the researchers concluded that the consumption of xylitol gum is very beneficial for health when consumed in the right amount or dose. Besides being able to help reduce the desire to smoke xylitol gum, it can also reduce the accumulation of plaque on the teeth of children and adolescents or adults. This is caused by an increase in mechanical activity in the mouth and teeth, thereby increasing the salivary flow rate so that the pH in saliva increases compared to when smoking cigarettes.

The Effectiveness of Mint Candy on Cigarette Weaning in Adolescent Age Group

Mint candy is candy that contains peppermint, a type of plant from the genus Mentha as a mint flavoring agent. The mouth contains sensory neurons containing a protein, namely the transient receptor potential cation channel subfamily M member 8 (TRPM8). TRPM8 is an ion channel, which regulates the flow of ions between cellular membranes like a water channel that regulates the transit between water bodies. Cold temperatures allow Na+ and Ca2+ ions to cross channels and enter nerve cells, changing their electrical potential and causing neurons to send signals to the brain that are interpreted as cold sensations (Helmenstine, 2021).

Mint contains an organic compound called menthol which binds to TRPM8, this causes ion channels to open as if the receptors were exposed to cold and relays this information to the brain. Menthol makes neurons sensitive to effects that don't go away when you expel mint or stop chewing mint. When drinking cold water afterwards, the temperature will feel very cold (Helmenstine, 2021).

Mint leaves which contain menthol and mentone are effective for controlling anxiety because these compounds can activate the nervous system so that it has an antidepressant or calming effect. The sensation of cold felt and a calming aroma causes a distraction that can forget the desire to consume cigarettes (Purnomo et al., 2021).

Based on the description of the discussion above, the researcher concludes that the consumption of mint candy containing menthol and mentone is effective for calming so that respondents do not need other media such as cigarettes to find peace. Mint candy also has a cooling sensation when it binds to TRPM8 in the mouth, thus mint candy is very beneficial when consumed in the right amount or dose.

Differences in Effectiveness Between Chewing Gum and Mint Gum on Cigarette Weaning in Adolescent Age Groups

Based on the results of research conducted by researchers that chewing gum and mint are effective in weaning cigarettes in the adolescent age group. This is evidenced by a significant decrease in the number of cigarette consumption in each group, namely before and after being given the cigarette substitution media intervention in the form of chewing gum and mint candy. However, when the Mann Whitney test was conducted to determine whether or not there was a difference in each intervention, the results showed that there was no significant difference between the chewing gum group and the mint candy group in weaning cigarettes in the adolescent age group.

Xylitol gum is a sugar-free gum that contains xylitol as a natural sugar substitute. Xylitol is a five carbon polyalcohol, xylitol is metabolized in the liver and converted to D-xylulose and glucose by polyol dehydrogenase. The degree of sweetness of xylitol is almost the same as that of sucrose. Oral bacteria, namely Streptococcus mutans, if cashed with xylitol will form xylitol-5-phosphate, which is able to inhibit the glycolysis process (a process that results in the conversion of one glucose molecule into two pyruvate molecules) (Guyton & Hall, 2014).

Mint candy is candy that contains mint. Mint leaves which contain menthol and mentone are effective for controlling anxiety because these compounds can activate the nervous system so that it has an antidepressant or calming effect. The sensation of cold felt and the calming aroma causes a distraction that can forget the desire to consume cigarettes. From this, it can be concluded that mint and chewing gum have their respective contents that can reduce the desire to smoke .

Xylitol is a five carbon polyalcohol, xylitol is metabolized in the liver and converted to D-xylulose and glucose by polyol dehydrogenase. The degree of sweetness of xylitol is almost the same as that of sucrose. So there is no significant difference between the sweetness produced by sucrose and xylitol. Xylitol candy also contains mint flavoring, so it can be concluded that the presence of the same content between chewing gum and mint resulted in no significant difference in weaning cigarettes between the chewing gum group and the mint candy group.

4. CONCLUSION

Based on the most age, respondents aged 16 years were 30 respondents or 48.4%. Based on the age at first smoking, the highest number was in the age range of 11-13 years as many as 31 respondents or 50%. Based on the presence of smokers in the family as many as 53 respondents or 85.5% have family members with smoking habits. Based on the types of cigarettes consumed, the highest number was filter cigarettes as many as 60 respondents or 96.8. Based on BMI, the respondents with BMI below normal were 38 respondents or 61.3%. Based on health status, the respondents with the highest number of healthy conditions were 60 respondents or 96.8%.

Based on the results of the physical examination, most of the respondents had normal SpO2 and respiration values. As for the examination of pulse frequency, salivary pH and lip color, most of the respondents had abnormal values.

There is a significant change between the amount of cigarette consumption before the intervention and the amount of cigarette consumption after the intervention in the group given the chewing gum intervention, which means that chewing gum is effective in reducing the number of cigarette consumption.

There was a significant change between the amount of cigarette consumption before the intervention and the amount of cigarette consumption after the intervention in the group given the mint candy intervention, which means that mint candy is effective in reducing the number of cigarette consumption.

There was no difference in effectiveness between smoking weaning before and after the intervention between chewing gum and mint candy.

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REFERENCES

Asmalinda, W., Sapada, E., & Agustin, Y. (2021). Peningkatan pH Saliva Perokok Aktif Menggunakan Permen Karet Xylitol. *Jurnal Kesehatan*, *12*(3), 427–434.

Bagaskoro, A., & Amelia, V. L. (2020). Hubungan Antara Konsumsi Rokok Dengan Status Nutrisi Pada Remaja. *Jurnal Keperawatan Muhammadiyah*, *5*(2), 1–5.

Elpasa, G., Lina, D. A., & Pasaribu, J. (2021). Faktor-faktor yang Berhubungan Dengan Perilaku Merokok pada Remaja di Nanga Bulik. *I Care Jurnal Keperawatan STIKes Panti Rapih*, *2*(1), 58–65.

Global Burden of Disease (GBD) 2019. (2021). *Seattle, WA : Institute for Health Metrics and Evaluation(IHME)*. University of Washington.

Guyton, & Hall. (2014). *Text Book Physiology Medicine* (11th ed.). EGC.

Helmenstine, A. M. (2021). *Why Does Mint Make Your MOuth Feel Cold?* https://www.thoughtco.com/why-mint-makes-mouth-feel-cold-607450

Kemenkes RI. (2013). *Pencantuman Peringatan Kesehatan dan Informasi Kesehatan pada Kemasan Produk Tembakau*. Kemenkes RI.

Kodir, & Margiyati. (2021). Hubungan Derajat Merokok Dengan Saturasi Oksigen Pada Mahasiswa Akper Kesdam IV/Diponegoro Semarang. *Jurnal Pengabdian Kepada Masyarakat Sisthana*, *3*(2), 16–20.

Muliyana, D., & Thaha, I. leida M. (2013). Faktor Yang Berhubungan Dengan Tindakan Merokok Pada Mahasiswa Universitas Hasanuddin Makassar. *Jurnal MKMI*, 109–119.

Nainggolan, O., Dharmayanti, I., & Kristanto, A. Y. (2020). Hubungan Antara Perilaku Merokok Anggota Rumah Tangga Dengan Perilaku Merokok Remaja di Indonesia (Analisis Data Riskesdas Tahun 2018). *Buletin Penelitian Sistem Kesehatan*, *23*(2), 80–88. https://doi.org/10.22435/hsr.v23i2.3104

Nursalam. (2017). *Metodologi Penelitian Ilmu Keperawatan* (2nd ed.). Salemba Medika.

PP RI No 109 Tahun 2012. (2012). *Pengamanan Bahan yang Mengandung Zat Adiktif Berupa Produk Tembakau bagi kesehatan*.

Purnomo, S. D., Oktariani, M., & Wulanningrum, D. N. (2021). Pengaruh Terapi Slow Deep Breathing Dengan Aromatherapi Peppermint terhadap Sindrom Burnout Pada Mahasiswa Tingkat Akhir Dalam Menyelesaikan Skripsi Di Universitas Kusuma Husada Surakarta. *Universitas Kusuma Husada Surakarta*, 1–9.

Qalbi, Z. M., Irramah, M., & Asterina. (2018). *Perbedaan Derajat Keasaman (pH) Saliva Antara Perokok dan Bukan Perokok Pada Siswa SMA PGRI 1 Padang*. *7*(3), 1–6.

Revien, I., Supit, A. S. R., & Anindita, P. S. (2020). *Kebiasaan Merokok dan Terjadinya Smoker's Melanosis*. *8*(2), 44–53. https://doi.org/10.35790/eg.8.2.2020.29903

Riskesdas. (2018). *Lembaga Penerbit Badan Penelitian dan Pengembangan Kesehatan*. Kemenkes RI.

Sumartiningsih, S., Lin, H.-F., & Lin, J.-C. (2019). *Cigarette Smoking Blunts Exercise-Induced Heart Rate Response Among Young Adult Male Smokers*. *16*(6), 1–9.

Thahir, A. (2018). *Psikologi Perkembangan*. Aura Publishing.

Wirawan, E., & Puspita, S. (2017). The Effect of Saliva pH and Buffer Capacity on DMF-T and DEF-T in The Mixed Teeth Children (6-12 Years Old). *Insisiva Dental Journal*, *6*(1), 25–30.