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Effect of Crushed Binahong (Anredera cordifolia) Leaves on Oral Health Among Pregnant Women

Adetia Pratama[1], Dewi Yuliana[1], Santi Oktavia[1]
[1]Department of Nursing, Universitas Mitra Indonesia, Indonesia

Correspondence author: Dewi Yuliana
Email: Oadepo7@gmail.com
Address: Jl. ZA Pagar Alam no 7 Gedong Meneng Bandar Lampung, Indonesia 082180076697
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ABSTRACT

Introduction: Pregnancy is a common event in a woman's life. It is a physiological state accompanied by hormonal changes, which affect not only general health but also dental and oral health. A pre-survey conducted by researchers on October 14, 2025, of five pregnant women revealed that two reported using binahong leaves as a mouthwash in addition to using toothpaste to brush their teeth. Three had never used binahong as a mouthwash.
Objective: The purpose of this study is the effect of boiled binahong leaves (Anredera cardifolia) on maintaining oral health in pregnant women at the Usmalanah Saddam Tanjung Senang Health Center in Bandar Lampung in 2025.
Method: This research was conducted from December 18-24, 2025, at the Usmalanah Saddam Tanjung Senang Health Center in Bandar Lampung. The population consisted of 30 pregnant women. The total sampling method was used, resulting in a total sample of 30 respondents. Data collection used a salivary pH observation sheet. The statistical test used was the dependent t-test.
Result Based on the data analysis, the α value was 0.000. α value <0.05. This means that boiled binahong leaves (Anredera cardifolia) have an effect on maintaining oral health in pregnant women at the Usmalanah Saddam Tanjung Senang Health Center in Bandar Lampung in 2025.
Conclusion: Therefore, planting binahong leaves at home is recommended, as they are very beneficial for health, especially in maintaining personal hygiene.

Keywords: binahong leaves, oral health, pregnant women

Introduction

Pregnancy is a common occurrence in a woman's life. It is a physiological state accompanied by hormonal changes, which affect not only general health but also dental and oral health. The increased risk of oral disease in pregnant women can be caused by several factors, such as the gag reflex, nausea and vomiting, which can increase the risk of dental caries, a fear of brushing teeth due to gingival inflammation during pregnancy, and even changes in behavior or habits, such as neglecting oral hygiene, which can increase the frequency of caries and periodontal disease (Tampubolon et al., 2025).

Each year, an estimated 21 million girls aged 15–19 in developing countries become pregnant, and approximately 12 million of them give birth. Globally, the Adolescent Birth Rate (ABR) has decreased from 64.5 births per 1,000 women (aged 15–19 years) in 2000 to 41.3 births per 1,000 women in 2023. Oral diseases encompass a wide range of diseases and conditions, including dental caries, periodontal (gum) disease, tooth loss, oral cancer, oro-dental trauma, noma, and birth defects such as cleft lip and palate. Oral diseases are among the most common non-communicable diseases worldwide, affecting an estimated 3.5 billion people, including those during pregnancy. More than 70% of these oral health problems occur in low-income countries. Gingivitis remains a major oral health problem, reaching 85% by 2024. Although the global oral health burden continues to rise, particularly in low- and middle-income countries, the overall burden of oral health services is likely to continue to increase due to population growth and aging (WHO, 2024).

Oral health problems among pregnant women in Indonesia, recognized by the Ministry of Health, include gingivitis, caries (cavities), and pregnancy-related tumors, caused by hormonal changes (increased estrogen and progesterone levels) and poor oral hygiene. These disorders can worsen pregnancy outcomes due to lack of nutrition and pain, and even pose risks to the fetus if infections are left untreated. Poor oral health can increase the risk of certain diseases, such as heart disease, lung disease, arthritis, and pregnancy-related abnormalities. The most common problems are tooth decay, cavities, and pain (45.3%), and gum problems (swollen gums/abscesses) at 14%. These disorders are also common in pregnant women and are related to pregnancy-related conditions, such as increased hormones that trigger caries. (Ministry of Health, 2024).

One of the main agendas of the SDGs is to reduce maternal and child mortality rates. Regular, high-quality antenatal care during pregnancy will determine the health status of both the mother and the baby. To date, the Maternal Mortality Rate (MMR) remains at around 305 per 100,000 live births, far from reaching the target of 183 per 100,000 live births by 2024. Likewise, we still need to save infants and toddlers from death. The Ministry of Health will gradually fulfill the need for ultrasounds in all community health centers (Puskesmas) in Indonesia. Dental and oral problems remain a significant issue related to the health of pregnant women. Tooth decay, cavities, and pain are recorded at 40.8%, and gum problems (swollen gums/abscesses) reach 23%. These disorders are also common in pregnant women and are related to pregnancy conditions, such as increased hormones that trigger caries (Ministry of Health, 2023).

Antenatal Care (ANC) visits are a series of regular examinations carried out by pregnant women at health facilities (community health centers, clinics, hospitals) to monitor the health of the mother and fetus. The main purpose of ANC visits is to detect health problems in pregnant women early, prevent complications, prepare for childbirth, and provide education about pregnancy and childbirth. The number of ANC visits in Lampung Province in 2024 reached 77.4%. Coverage of health services for pregnant women, women in labor, and

postpartum mothers in regencies/cities throughout Lampung Province in 2022 was 160,016 pregnant women. Meanwhile, in Bandar Lampung City, the number of pregnant women was 19,592 pregnancies. Dental and oral problems in pregnant women in Lampung are common due to hormonal changes, which can increase the risk of gingivitis and decrease salivary pH, which triggers dental problems. There were 2,864 cases of dental and oral disorders recorded in 2024. This was slightly higher compared to 2,343 cases in 2023. A total of 842 cases of dental and oral disorders were found in Bandar Lampung in 2024 (Lampung Provincial Health Office, 2024).

Oral health is a condition that occurs in the oral cavity, including hygiene and health, as well as disorders and abnormalities in the oral cavity, characterized by bad breath, toothache, swollen gums, canker sores, and excessive saliva production (Wijaksana, 2024). Poor oral health in pregnant women can impact the health of the fetus and mother, increasing the risk of premature birth, low birth weight (LBW), and preeclampsia. Bacterial infections from the mouth can spread through the bloodstream, causing pregnancy complications, disrupting fetal growth and development, and even causing mental and physical health problems in the mother, such as difficulty eating and pain (Tampubolon et al., 2025).

Oral health disorders can be managed pharmacologically with medications such as Kenalog in Orabase, Minosep, Paracetamol, ibuprofen, lidocaine, Benzydamine, Riamcinolone acetonide, Chlorhexidine solution, and Triamcinolone acetonide. Indonesians generally use traditional medicine as a complement to medical medications, and some still believe it is an alternative treatment for various diseases. Traditional medicine is defined as a concoction consisting of ingredients obtained from plants, animal sources, minerals, and extracts, mixed and prepared for consumption. These concoctions have been traditionally believed by people to have curative effects for various ailments. Traditional medicine is also called herbal medicine because the ingredients used are derived from natural sources (Dillasamola et al., 2023).

Our bodies require essential substances to protect them, one of which is antioxidants, which can protect the body from free radical attacks by reducing the negative effects of these compounds. From ancient times to the present, many people have used medicinal plants in traditional ancestral recipes to treat illnesses due to the abundance of diverse plants in Indonesia. This leaves some people unaware of the many beneficial plants around them.

One plant with potential as a free radical scavenger is the binahong leaf (Anredera cordifolia). Binahong leaves contain various secondary metabolites, such as flavonoids, alkaloids, polyphenols, and saponins, which have significant health benefits. Flavonoids, as active compounds, play a crucial role as antibiotics by inhibiting the function of microorganisms, including bacteria and viruses. From a pharmacological perspective, flavonoids also function as anti-inflammatories, analgesics, and antioxidants (Amin et al., 2022). The binahong leaf herb, which grows rapidly in humid and cool areas, has great potential for development in tropical climates, such as Indonesia. In general, people use this plant as a medicine for various conditions, including external wounds, internal wounds, gastritis, cholesterol-lowering, diabetes, cancer, and various other diseases (Hakim, 2021).

The role of nurses in the oral health of pregnant women includes oral health education, nutritional counseling, monitoring the condition of teeth and gums, and referrals to dentists for more complex treatments. Nurses provide an understanding of the importance of brushing teeth twice daily, using dental floss, and how to manage nausea and vomiting to protect the health of the teeth and gums of both mother and fetus. This involves the following steps: (1) Explaining the importance of maintaining oral health; (2) Providing oral hygiene

guidance; (3) Encouraging a healthy diet; and (4) Providing tips for managing nausea and vomiting. Nurses also play a role in monitoring and referrals, including monitoring dental and gum health, encouraging regular dental checkups, providing guidance on safe treatment, and limiting the use of x-rays (Wihardja & Djuwantono, 2021).

Oral health care for pregnant women includes home care such as brushing twice daily with fluoride toothpaste, flossing, and using alcohol-free mouthwash, as well as professional care that is safe for pregnant women, such as scaling, fillings, and emergency treatment. It is also important to maintain a healthy diet by limiting sugary foods and consulting a dentist before undergoing invasive medical procedures, such as x-rays or tooth extractions (Malawat & Rosmalia, 2025).

Objective

The purpose of this study is the effect of boiled binahong leaves (Anredera cardifolia) on maintaining oral health in pregnant women at the Usmalanah Saddam Tanjung Senang Health Center in Bandar Lampung in 2025.

Method

This research was conducted from December 18-24, 2025, at the Usmalanah Saddam Tanjung Senang Health Center in Bandar Lampung. The population of this study was all 30 pregnant women at the Usmalanah Saddam Tanjung Senang Pre-natal Care Center (PMB) in Bandar Lampung. Total sampling was used, with the entire population being taken as a sample, with 30 respondents. The study began with a visit to the respondents, both at the PMB and at their homes. The researchers explained the purpose and objectives and then asked them to sign a consent form. The researchers then measured the respondents' salivary pH as a pre-test. Afterward, they were given boiled binahong leaves. They were then asked to gargle twice daily, upon waking and before going to bed. On the seventh day, the researchers returned to measure the respondents' salivary pH as a post-test. The total sampling method was used, resulting in a total sample of 30 respondents. Data collection used a salivary pH observation sheet. The statistical test used was the dependent t-test. In this study, the calculation of the difference test was carried out using a statistical test application, namely the p value, then compared with $\alpha = 0.05$. If the p value $< \alpha = 0.05$ then there is an influence between the two variables. If $p > \alpha = 0.05$ then there is no influence between the two variables.

Result

Table 1. Frequency distribution of respondents' occupations

Ages	Frequency	Percent
< 20 years	0	0
20-35 years	30	100
> 35 years	0	0
Total	**30**	**100**

Based on Table above, data shows that 0 respondents were aged <20 years (0%). There were 30 respondents aged 20-35 years (100%), and 0 respondents aged >35 years (0%).

Table 2. Frequency distribution of respondents' occupations

Occupation	Frequency	Percent
Government/private employee	8	26.7
Interpreneur	7	23.3
Housewife	15	50.0
Total	**30**	**100.0**

Based on Table above, data shows that 8 respondents (26.7%) were government/private employees. 7 respondents (23.3%) were self-employed. 15 respondents (50.0%) were housewives.

Table 3. Frequency distribution of respondents' education

Education	Frequency	Percent
Junior High School	1	3.3
Senior High School	16	53.3
University	13	43.3
Total	**30**	**100.0**

Based on Table above data shows that 1 respondent had a junior high school education (3.3%), 16 respondents had a high school education (53.3%), and 13 respondents had a college education (43.3%).

Table 4. Frequency Distribution of Average Saliva pH

	Mean	***N***	***Std. Deviation***
Ph Before	5.46	30	1.022
Ph After	6.83	30	.669

Table shows that the average salivary pH before binahong leaf intervention was 5.46, and after binahong leaf administration, it increased to 6.83. It appears that binahong leaves normalized salivary pH, increasing salivary pH to a more normal level, from its initial approach to acidity.

Table 5. Bivariate Analysis

	Mean	***Std. Deviation***	***Std. Error Mean***	***p-value***
Ph b efore - Ph after	.577	.568	.104	.000

Based on the data analysis in Table 4.3, the mean salivary pH before and after measurement was 0.577, with a deviation of 0.568 and a deviation error of 0.104. The α-value was 0.000. α-value <0.05. Therefore, it can be interpreted that boiled binahong leaves (Anredera cardifolia) have an effect on maintaining oral health in pregnant women at the PMB Usmalanah Saddam Tanjung Senang Bandar Lampung in 2025.

Discussion

Based on data analysis, the average salivary pH before binahong leaf intervention was 5.46, and after binahong leaf administration, it increased to 6.83. Binahong leaves appear to

normalize salivary pH, increasing it to a more normal level, from its original approach to acidity.

According to (Malawat & Rosmalia, 2025), oral health refers to a condition that occurs in the oral cavity, affecting both cleanliness and health, as well as any disorders or abnormalities. The mouth consists of the upper and lower lips, gums, tongue, inner cheeks, and palate. The lining of the gums, cheeks, and palate is always moist and slimy; therefore, the surfaces of these membranes are called mucous membranes. Thus, there are mucous membranes of the gums, palate, and cheeks (Wijaksana, 2024). The functions of teeth are: 1) for speech, 2) for chewing food. According to the shape of the teeth, incisors cut and shear food, canines tear food, and molars grind and grind food, and 3) for beauty. The mouth also contains gums that cover the necks of the teeth and the jawbone.

In line with the theory (Restuning, 2022), improving dental health requires health education with several objectives, including: First, achieving behavioral changes in individuals, families, and communities by fostering and maintaining healthy behaviors and a healthy environment, as well as an active role in efforts to achieve optimal health. Second, developing healthy behaviors in individuals, families, and communities that align with the concept of a healthy lifestyle, both physically, mentally, and socially, thereby reducing morbidity and mortality. Third, changing individual and/or community behavior in the health sector.

In line with the theory (Yulianty et al., 2021) in maintaining oral health, binahong leaves contain flavonoids that act as anti-inflammatory, antibacterial, analgesic, and antioxidants. Flavonoids are the largest group of phenolic compounds. They are effective in inhibiting the growth of viruses, bacteria, and fungi. Flavonoid compounds generally have antioxidant properties and are widely used as components of pharmaceutical raw materials. Another benefit of flavonoids is protecting the body's cell structure.

A study conducted (Aulia et al., 2025) examined the oral hygiene status and periodontal health of pregnant women living in coastal areas: a cross-sectional study. The results showed that pregnant women living in coastal areas had poor OHI-S scores. The CPITN results for pregnant women were: healthy periodontal 1.4%; calculus 81.9%; pockets 4-5 mm 9.7%; and pockets 6 mm 6.9%.

Based on this analysis, the researchers assumed that binahong has a positive impact on oral health. The content of binahong leaves, which is useful in eradicating infection-causing microorganisms, is beneficial for oral health, which contains many bacteria. The resulting effects include the elimination of bad breath and the prevention of dental and oral problems. The data obtained showed a α value of 0.000, with a α value <0.05. This indicates that boiled binahong leaves (Anredera cardifolia) have an effect on maintaining oral health in pregnant women at the Usmalanah Saddam Tanjung Senang Bandar Lampung PMB in 2025.

According to (Hakim, 2021), applying binahong leaves to the oral area acts as an antibacterial, one of the effects of flavonoid compounds. Flavonoids have antioxidant, anti-inflammatory, antimutagenic, and anticarcinogenic properties, supported by their ability to modulate the function of key cellular enzymes. Flavonoids also act as potent inhibitors of several enzymes, such as xanthine oxidase (XO), cyclooxygenase (COX), lipoxygenase, and phosphoinositide 3-kinase (Panche, Diwan, and Chandra, 2016). Flavonoids in binahong leaves act as anti-inflammatory agents by inhibiting leukotriene production, which can suppress the inflammatory process by preventing excessive neutrophil accumulation, resulting in a decrease in the average area of TNF-α expression.

The results of this study align with research conducted by (Welliam, 2020) on the Effect of Gargling with Binahong Leaf Decoction (Anredera cordifolia) on Salivary pH. The results

showed a significant increase in salivary pH after gargling with binahong leaf solution ($p = 0.000$; $p < 0.05$), indicating a statistically significant difference between pre- and post-test measurements. In conclusion, gargling with binahong leaf decoction has a significant effect on increasing salivary pH and can serve as a non-pharmacological alternative to support oral health.

Based on the discussion presented, the researchers conclude that binahong leaves are excellent for maintaining oral hygiene, particularly in maintaining stable salivary pH. The presence of flavonoids and other beneficial substances is key to the efficacy of binahong leaves in maintaining hygiene, acting as antibacterials, antimicrobials, and anti-inflammatory agents. Therefore, the researchers hope that the public, especially pregnant women, can apply this therapy, given that binahong leaves are readily available and inexpensive.

Conclusion

The majority of respondents (30 people) were aged 20-35 years. The majority of respondents (100%) were housewives (15 people) (50.0%). The majority of respondents (16 people) had a high school education (53.3%). The average salivary pH before the binahong leaf intervention was 5.46.The average pH after the binahong leaf intervention was 6.83.

The α-value was 0.000. α-value <0.05. This indicates that boiled binahong leaves (Anredera cardifolia) have an effect on maintaining oral health in pregnant women at the 2025 Usmalanah Saddam Tanjung Senang Bandar Lampung Pre-natal Care Program.

Conflict of Interest

No declare.

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Authors' contribution

Each author contributed equally in all the parts of the research. All authors have critically reviewed and approved the final draft and are responsible for the content and similarity index of the manuscript.

Conflict of interest

The authors declare that there is no conflict of interest regarding the publication of this paper. This research was conducted independently without any financial, commercial, or personal relationships that could be construed as a potential conflict of interest. All processes, including study design, data collection, analysis, and manuscript preparation, were carried out objectively and without external influence.

Ethical consideration

Not applicable.

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