

Innovation in Anemia Prevention Among Adolescents, Women of Childbearing Age, Pregnant Women, Postpartum Women, And Toddlers With Jupalof (Ambon Banana Smoothies Mixed with Low-Fat Milk)

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ABSTRACT

Background: Anemia is associated with cognitive and motor development disorders in infants and children; in adolescents and WUS, it reduces quality of life, educational effectiveness, and reproductive health. Therefore, prevention methods that can improve iron levels offer benefits to communities and families in both the short and long term. JUPALOF, a mixture of Ambon banana juice and low-fat milk, is a functional food designed to prevent anemia. The JUPALOF formulation must balance the ratio of ascorbic acid (vitamin C) to calcium content by adding additional fortification and selecting low-fat milk. Clinical studies show that iron absorption can be significantly improved with vitamin C. **Purpose:** This community service was carried out with the aim of addressing the problem of anemia found in the TPMB Enok Siti Roiyatul area. **Method:** The method used in this community service involves lectures, discussions, and demonstrations. This study targets pregnant women with anemia in the TPMB Enok Siti Roiyatul area. **Result:** From the results of community service activities, mothers understand that JUPALOF is a banana drink with low-fat milk that can prevent anemia if consumed regularly and accompanied by a healthy diet and adherence to iron supplements as recommended by health workers. **Conclusion:** Based on an evaluation conducted after providing education on banana juice with low-fat milk, pregnant women gained increased knowledge about anemia, its impact on health, and the importance of balanced nutrition. The JUPALOF innovation, as a nutritious beverage alternative, was considered easy to make, easy to obtain, and acceptable as a beverage that can prevent anemia when consumed regularly.

Keywords: Anemia; Banana; Nutrition Education; Pregnant Woman

Introduction

Iron deficiency anemia remains a significant public health problem. It most often affects vulnerable groups such as adolescents, women of childbearing age (WCA), pregnant women, postpartum women, and toddlers. As shown by national and regional health surveys, these groups are still very common. Therefore, effective, affordable, and community-friendly preventive interventions should be a top priority in efforts to reduce the burden of disease associated with anemia(3).

The WHO states that approximately 36.5% of pregnant women worldwide suffer from anemia(4). In Indonesia, however, the 2022 Indonesian Nutrition Status Survey (SSGI) found that 48.9% of pregnant women suffer from anemia(5). The World Health Organization reports that in 2023, 30.7% of women of reproductive age (15–49 years) and 35.5% of pregnant women suffer from anemia(6). In addition, the prevalence of anemia in children aged 6–59 months worldwide reaches 39.8%. This shows that anemia remains a major problem worldwide.

The number of women of childbearing age who are not pregnant in Depok City in 2024 is 339,226, with 6,868 prospective brides suffering from anemia (512 cases) and 350 suffering from malnutrition. At the Pancoran Mas Community Health Center, there are 18,534 women of childbearing age, including 96 prospective brides, 7 of whom suffer from anemia, and 7 others who are malnourished.

In pregnant women, anemia increases the risk of premature birth, low birth weight, and maternal complications, among the clinical and social effects of anemia in vulnerable populations. Anemia is associated with cognitive and motor development disorders in toddlers and children; in adolescents and WUS, it reduces quality of life, educational effectiveness, and reproductive health. Therefore, prevention methods that improve iron status offer benefits to communities and families in both the short and long term(1). Ambon bananas (*Musa paradisiaca*) are recognized for their rich nutritional profile, including moderate levels of carbohydrates, proteins, and essential minerals which are crucial for health(4). They contain micronutrients beneficial for individuals with anemia, notably iron and vitamin C which enhances iron absorption (7). A study highlighted the positive effects of consuming Ambon bananas, resulting in increased hemoglobin levels among pregnant women consuming them regularly(8). The synergistic effect of these bananas, when

consumed as a part of a balanced diet, suggests they could serve as a valuable dietary intervention for anemia (7,8)

In addition, the utilization of banana-derived fibers has been investigated for their roles in improving food products, such as yogurt, thereby enhancing nutrient delivery while maintaining low-fat content(9). The fibers extracted from bananas can contribute to health benefits through improved gut health and nutrient absorption, making them a beneficial option for diets aimed at preventing anemia.

JUPALOF, a mixture of Ambon banana juice and low-fat milk, is a functional food designed to prevent anemia. JUPALOF is based on several nutritional principles, such as: bananas contain vitamin C and many minerals and fiber; vitamin C is known to increase the absorption of non-heme iron by reducing the ferric form of iron, which is more easily absorbed; milk can improve overall nutritional status, thereby supporting iron metabolism; and the calcium minerals and casein components contained in bananas can increase absorption. To reduce the inhibitory effect on absorption, the JUPALOF formulation must balance the ratio of ascorbic acid (vitamin C) to calcium content by adding additional fortification and selecting low-fat milk. Clinical studies show that iron absorption can be significantly improved with vitamin C (2).

Based on the latest data at TPMB Enok Siti Roiyatul in 2025 for the period January-October 2025, there were 720 pregnant women who underwent pregnancy check-ups, some of whom had complications, namely 195 mothers with anemia, 112 with chronic energy deficiency, 10 with hypertension, and 28 with grande multipara. There were a total of 117 deliveries, including 2 cases of placenta retention, 5 cases of KPD, 1 case of hemorrhage, and 7 cases of anemia. Among postpartum mothers, including those who had undergone cesarean sections, 150 mothers were monitored at the Enok TPMB, 25 of whom suffered from anemia, 2 from mastitis, and 10 from chronic energy deficiency. For toddler visits, there were a total of 370 visits, among which there were 2 cases of anemia, 25 cases of underweight, and 15 cases of stunting. Among adolescent girls, there were a total of 10 visits, with 3 cases of anemia, 1 case of chronic energy deficiency, and 2 cases of menstrual disorders. For women of childbearing age, namely non-pregnant women aged 15-49 years and prospective brides, there were a total of 41 visits, including 8 with menstrual disorders, 2 with infertility, 20 with vaginal discharge, and 10 with anemia.

As a result of searching the KIA service register data and hemoglobin test results in the target group, Midwife Enok Siti Roiyatul found that anemia still exists in various

vulnerable groups. Because anemia is still a real health problem at the independent midwifery service level, innovative, sustainable, and easy-to-use preventive measures are needed for all target groups. Therefore, as proof of our commitment to the community, we will introduce our new product called JUPALOF, which stands for Ambon Banana Juice and Low Fat Milk.

Method

This community engagement activity employs the Focus Group Discussion (FGD) method to identify potential solutions to the issue of Anemia. The program included educational lectures on anemia, including its symptoms, prevention strategies, and intervention approaches. It introduces banana smoothies with low-fat milk as an innovative alternative to prevent anemia, using a quasi-experimental one-group pretest-posttest design, in which the knowledge of 15 pregnant women at the TPB Bidan Enok Siti midwifery clinic was measured before and after community intervention to assess the increase in knowledge about anemia.

Results

As part of the educational content, this discussion also highlighted JUPALOF as a nutrient-rich beverage. The discussion covered the nutritional value of JUPALOF and introduced innovative approaches to beverage processing, specifically transforming bananas and milk into beverages to increase their appeal to pregnant women by enriching the flavor and preventing boredom with the beverage. The session continued with a live demonstration explaining the step-by-step process of making JUPALOF, a banana juice drink with low-fat milk, which was then followed by a pretest before the education session and a posttest after the demonstration session to compare knowledge. Based on the results of measurements of 15 respondents Adolescents, Women of Childbearing Age, Pregnant Women, Postpartum Women, and Toddlers, the pretest score had an average value of 68.33 and the posttest score had an average value of 95.33. The t-test results showed that the average posttest score was significantly higher than the average pretest score. Thus, there is a statistically significant difference between the pretest and posttest scores after the intervention was given ($p < 0.05$).

Discussion

Complementary therapy based on evidence-based practices for stunting prevention at TPMB Enok Siti Roiyatul, Jakarta. Complementary therapy applied during community service activities at TPMB Enok Siti Roiyatul is based on evidence-based practices regarding

its effectiveness in preventing stunting. This approach is supported by findings from a study entitled “Low-fat banana milk (JUPALOS)” conducted at the Enok Siti Roiyatul Midwife Clinic in Pancoran District, Depok, in 2025. This study used purposive sampling and involved 15 pregnant women. This study used a quasi-experimental design with a one-group pretest-posttest approach, with an intervention provided. Based on the results of measurements of 15 respondents, the pretest score had an average value of 68.33, and the posttest score had an average value of 95.33. The t-test results showed that the average posttest score was significantly higher than the average pretest score. Thus, there is a statistically significant difference between the pretest and posttest scores after the intervention was given ($p < 0.05$).

The results of the paired t-test prove that the intervention provided in this study had a significant effect on increasing the respondent's score, with an increase in pregnant women's knowledge of nutrition can be considered an effective complementary strategy to prevent anemia in pregnant woman particularly in clinical and community health settings.

Conclusion

The community service activity entitled “Innovation in Anemia Prevention among Adolescents, Women of Childbearing Age, Pregnant Women, Postpartum Women, and Toddlers with JUPALOF (Ambon Banana Juice Mixed with Low-Fat Milk)” was successfully carried out at TPMB Bidan Enok Siti Roiyatul, Pancoran Mas District, Depok City, and received positive responses from the community.

Through this activity, participants gained increased knowledge about anemia, its impact on health, and the importance of balanced nutrition as a preventive measure against anemia. The JUPALOF innovation, as a nutritious beverage alternative, is considered easy to prepare, uses readily available ingredients, and is acceptable to various target groups. JUPALOF The combined consumption of Ambon bananas and low-fat milk represents a promising dietary strategy for the prevention of anemia, particularly in vulnerable groups such as pregnant women. The nutritional synergies observed suggest that incorporating these foods can lead to improved hemoglobin levels and better overall health outcomes. Future studies should pursue in-depth explorations into how different dietary patterns including these components could holistically address nutritional deficiencies associated with anemia.

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Conflict of Interest

The authors declare no conflicts of interest regarding this manuscript.

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