Indonesia Berdaya, 5(4) 2024: 1479-1486
https://doi.org/10.47679/ib.20241038

P-ISSN 2502-4825
E-ISSN 2502-9495

# Efforts to Increase Hemoglobin Levels Through the Administration of Snakehead Fish Nuggets in Postpartum Mothers in Sereh Village, Sentani District, Jayapura Regency

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Published online: 22 October 2024

**ABSTRACT**

This Community Service aims to improve the knowledge of postpartum mothers about protein-rich nutrition and factors that can inhibit iron absorption. The methods used include counseling, teaching the preparation of snakehead fish nuggets, and health examinations. This activity was conducted in Sereh Village, Sentani, from May to November 2023, with stages including leaflet distribution, nutritional counseling, and hemoglobin level checks before and after consuming nuggets for 14 days. Prior to the main activities, a trial for nugget preparation was conducted, followed by home visits for observation and evaluation. The hemoglobin level checks revealed that 10 (38.46%) postpartum and breastfeeding mothers experienced mild anemia, while 16 (61.54%) did not have anemia, with an average hemoglobin level of 10.196 g/dl. After consuming 100 grams of nuggets daily for 14 days, changes in hemoglobin levels were observed, with mothers who previously experienced mild anemia transitioning to a non-anemic status. The average hemoglobin level after consuming snakehead fish nuggets was 12.308 g/dl, with an average increase of 2.116 g/dl before and after nugget consumption. The conclusion of this community service activity indicates that postpartum mothers experienced an increase in knowledge regarding the importance of protein-rich nutrition and factors that can inhibit iron absorption.

Keywords: Hemoglobin, Snakehead Fish Nuggets, Postpartum Mothers

## INTRODUCTION

Anemia is a condition characterized by a deficiency of red blood cells (erythrocytes) in a person's blood. Anemia occurs due to a lack of hemoglobin, which also means insufficient oxygen delivery to the entire body. When oxygen levels decrease, the body becomes weak, lethargic, and unmotivated (Retnaningtyas & Siwi, 2020). The impact of anemia during the postpartum period can lead to subinvolution of the uterus, resulting in postpartum hemorrhage, increased susceptibility to puerperal infections, sudden cardiac decompensation after delivery, decreased breast milk production, and a higher risk of breast infections (Haryanti, 2019).

The causes of iron-deficiency anemia include dietary practices during the postpartum period, such as restrictions on consuming animal foods, as well as economic factors that lead to poor dietary patterns. Not all communities can afford to consume animal protein in every meal. However, animal foods are a significant source of highly absorbable iron (Lipoeto et al., 2020).

For breastfeeding mothers, the need for nutrients, including vitamins and minerals, increases. These nutrients are necessary not only for the mother's recovery after childbirth but also to meet the nutritional needs of the newborn. Infants aged 0-6 months require support from the

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nutrients consumed by their mothers. Therefore, it is crucial that every food or beverage consumed contains adequate and balanced nutrients to ensure the production of high-quality breast milk in sufficient quantities (Mochtar, 2012).

Pharmacological therapy to increase hemoglobin levels involves the administration of iron supplements. These supplements require nutritional intake to aid absorption in the body, one of which is protein. Protein plays a vital role in the transportation of iron within the body. A deficiency in protein intake can hinder iron transport, leading to iron deficiency. Iron deficiency results in lower hemoglobin (Hb) levels in the blood, which is classified as anemia (Haryanti, 2019).

Snakehead fish contains the highest level of albumin compared to other fish. Albumin is a type of protein that plays a crucial role in the transportation of iron within the body. A deficiency in protein intake can hinder iron transport, leading to iron deficiency (Rahmanda, 2014). One hundred grams of fresh snakehead fish contains 69 kcal; 25.2 g of protein; 1.7 g of fat; 0.9 mg of iron; 3.86 mg of zinc; 62 mg of calcium; 176 mg of phosphorus; 15 IU of vitamin A; 0.04 mg of vitamin B; and 69 g of water (Fajri, 2020).

The content of snakehead fish nuggets that will be given to postpartum mothers who are breastfeeding includes 9.12 g of carbohydrates, 18.66 g of protein, 2.28 g of albumin, 13.76 g of fat, 81.59 mg/kg of calcium, 2.95 mg/kg of iron, and 6.70 mg/kg of zinc per 100 grams. The protein in snakehead fish nuggets has a high nutritional value, is easily digestible, and can assist in the formation of muscle tissue. The protein from snakehead fish also contributes to improving breast milk quality (Dayanthi, 2020).

In line with research conducted by Fajri (2020) at RSUD Hj. Anna Banjarnegara titled "Extract of Snakehead Fish (Channa Striata) to Increase Hemoglobin Levels in Postpartum Mothers with Anemia," the study found that 1000 mg of snakehead fish extract over 14 days increased the average hemoglobin level by 1.08 g%.

Preliminary survey results at Sentani Health Center showed that in 2021 there were 322 postpartum mothers (Dinkes Kab. Jayapura 2021). The findings from this survey indicate that postpartum mothers are more vulnerable to anemia; out of 22 mothers who underwent hemoglobin testing in Sereh Village, Sentani District, Jayapura Regency, 8 mothers were found to be anemic, with an average hemoglobin level of 10 g/dL.

Generally, postpartum anemia occurs due to chronic iron deficiency, and a slight deficiency is a normal condition for mothers after childbirth. The process of delivery and vaginal bleeding during the postpartum period can lead to significant iron depletion in many mothers (Fajri, 2020).

If the nutritional intake is insufficient, anemia can occur after childbirth. Iron is essential for the production of hemoglobin, which functions to store and transport oxygen in red blood cells. Low iron levels can affect mood, making it difficult for mothers to bond with their babies. Maternal emotions may become unstable, leading to irritability and increased vulnerability to postpartum depression. Cognitive abilities may decline, resulting in forgetfulness, and fatigue from anemia can make it harder for mothers to breastfeed.

Based on the above discussion, this community service aims to provide knowledge (Transfer Knowledge) about the importance of nutritional intake rich in protein and various factors that can inhibit iron absorption. Additionally, it aims to teach postpartum mothers how to prepare snakehead fish nuggets for easy storage and daily consumption to meet their protein needs.

## IMPLEMENTATION METHOD

The method used in this community service activity involves counseling about protein-rich nutritional intake and factors that can inhibit iron absorption. This activity also includes teaching

postpartum mothers how to prepare snakehead fish nuggets, making this product easy to store and practical for daily consumption to meet protein needs. The implementation stages include: (a) distributing leaflets about the importance of nutritional intake during the postpartum period, (b) providing counseling to postpartum mothers regarding protein-rich nutrition and factors that inhibit iron absorption, (c) teaching how to prepare snakehead fish nuggets, and (d) conducting blood pressure and hemoglobin level checks in postpartum mothers before and after consuming the nuggets for 14 days, observed using food frequency/food recall questionnaires. The procedure begins with a case study and initial survey in Sereh Village, Sentani District, Jayapura Regency, to determine the number of postpartum mothers and conduct hemoglobin checks. The community service implementation starts with counseling, blood pressure checks, hemoglobin checks, teaching how to make nuggets, and distributing the nuggets to anemic postpartum mothers for consumption over 14 days. Monitoring is conducted using food frequency/food recall questionnaires, and evaluation is performed by measuring the hemoglobin levels of postpartum mothers after the consumption of snakehead fish nuggets. The activities in this community service include education (counseling), the use of media such as leaflets, demonstrations of nugget preparation, and hemoglobin checks for postpartum mothers. The evaluation design includes: (a) the community service team from the Jayapura Applied Bachelor Midwifery Program conducting counseling on the importance of protein-rich nutritional intake and factors that inhibit iron absorption to prevent or address anemia in postpartum mothers, and (b) attendance records of participants in the activities.

This community service activity is relevant to efforts to increase knowledge about the importance of protein-rich nutrition and factors that inhibit iron absorption for postpartum mothers, aiming to meet the nutritional needs of mothers to address and prevent anemia. With this community service, it is hoped that postpartum mothers will understand the importance of nutritional intake during the postpartum period and learn how to obtain more practical and easily consumable sources of protein daily to fulfill their nutritional needs and prevent or address anemia.

The implementation location is in Sereh Village, Sentani, from May to November 2023. The schedule includes preparation, implementation, and reporting of results. The preparation stage began in April 2022 with a case study and proposal drafting. Trials for nugget preparation were conducted on May 11 and June 2, 2023, followed by the actual nugget preparation on July 20-21. The implementation of activities began on July 26, 2023, with counseling by Endang Trisnawati, followed by health checks and nugget preparation training. Home visits and observations were conducted on August 2, 9, 16, 23, and 30 to check hemoglobin levels and collect data. The evaluation of the activities was carried out on September 14, 2023, concluding with the completion letter for the community service on November 22.

## RESULTS AND DISCUSSION

The community service conducted from May to November 2023 was successful in achieving its objectives, which aimed to provide knowledge (Transfer Knowledge) about the importance of protein-rich nutritional intake and the factors that can inhibit iron absorption, as well as to teach postpartum mothers how to prepare snakehead fish nuggets for easy storage and daily consumption to meet their protein needs.

The target of this community service activity was 26 postpartum mothers in Sereh Village, Sentani District, Jayapura Regency. The implementation began with counseling sessions, blood pressure checks, hemoglobin level assessments for postpartum mothers, teaching how to prepare nuggets, and distributing nuggets to anemic postpartum mothers for consumption over 14 days (100 grams/day). Monitoring was carried out using food frequency/food recall questionnaires, followed by evaluations by measuring the hemoglobin levels of mothers who had been given snakehead fish nuggets.

a. Knowledge Level About the Importance of Nutritional Intake to Prevent Anemia During the Postpartum and Breastfeeding Periods

**Table 1**
**Frequency Distribution Based on the Knowledge Level of Postpartum Mothers About the Importance of Nutritional Intake to Prevent Anemia**

| | Good | % | Poor | % |
|---|---|---|---|---|
| Before Counseling | 6 | 21 | 22 | 79 |
| After Counseling | 26 | 93 | 2 | 7 |

Source: Primary Data 2023

Based on Table 1, the knowledge level of postpartum mothers regarding the importance of nutritional intake to prevent anemia before counseling showed that 6 mothers (21%) had good knowledge, while 22 mothers (79%) had poor knowledge. After counseling, the number of mothers with good knowledge increased to 26 (93%), and those with poor knowledge decreased to 2 (7%). This indicates that the community service was very beneficial, as it significantly improved the knowledge of postpartum mothers about the importance of nutritional needs to prevent anemia during the postpartum and breastfeeding periods.

b. Hemoglobin Levels in Postpartum Mothers

**Table 2**
**Hemoglobin Levels of Postpartum and Breastfeeding Mothers in Sereh Village, Sentani District, Jayapura Regency**

| No | Hemoglobin Level Before Receiving Snakehead Fish Nuggets | Category | Mean | Hemoglobin Level After Receiving Snakehead Fish Nuggets | Mean | Average Increase |
|---|---|---|---|---|---|---|
| 1 | 10.9 | Mild Anemia | 10.192 | 11.9 | 12.308 | 2.116 |
| 2 | 10.0 | Mild Anemia | | 12.0 | | |
| 3 | 10.2 | Mild Anemia | | 12.5 | | |
| 4 | 10.5 | Mild Anemia | | 13.0 | | |
| 5 | 9.8 | Mild Anemia | | 12.0 | | |
| 6 | 9.9 | Mild Anemia | | 11.0 | | |
| 7 | 10.8 | Mild Anemia | | 13.0 | | |
| 8 | 10.0 | Mild Anemia | | 12.5 | | |
| 9 | 9.8 | Mild Anemia | | 12.8 | | |
| 10 | 10.6 | Mild Anemia | | 13.0 | | |
| 11 | 11.0 | Not Anemic | | 13.0 | | |
| 12 | 11.0 | Not Anemic | | 12.2 | | |
| 13 | 11.0 | Not Anemic | | 13.0 | | |
| 14 | 12.0 | Not Anemic | | 12.0 | | |
| 15 | 12.5 | Not Anemic | | 12.5 | | |
| 16 | 13.0 | Not Anemic | | 13.0 | | |
| 17 | 12.0 | Not Anemic | | 12.0 | | |
| 18 | 11.0 | Not Anemic | | 11.0 | | |
| 19 | 12.0 | Not Anemic | | 12.0 | | |
| 20 | 12.0 | Not Anemic | | 12.0 | | |
| 21 | 13.0 | Not Anemic | | 13.0 | | |
| 22 | 12.0 | Not Anemic | | 14.0 | | |
| 23 | 11.0 | Not Anemic | | 11.0 | | |
| 24 | 12.0 | Not Anemic | | 12.0 | | |
| 25 | 11.0 | Not Anemic | | 13.5 | | |
| 26 | 13.0 | Not Anemic | | 13.0 | | |

Iron deficiency anemia is defined as a condition where the hemoglobin level in the blood, hematocrit, or erythrocyte count is lower than normal due to a deficiency of one or more essential iron components. Mild anemia in pregnant women is indicated by a hemoglobin level of 10.9 g/dL to 10 g/dL, moderate anemia from 9.9 g/dL to 7.0 g/dL, and severe anemia below 7.0 g/dL.

Based on Table 2, the hemoglobin examination revealed that 10 (38.46%) postpartum and breastfeeding mothers experienced mild anemia, while 16 (61.54%) did not experience anemia, with an average hemoglobin level of 10.196 g/dL. After consuming 100 grams of nuggets daily for 14 days, changes in hemoglobin levels were observed in the anemic postpartum mothers, with average hemoglobin levels increasing to 12.308 g/dL, resulting in an average increase of 2.116 g/dL.

The impact of anemia on postpartum mothers can hinder their mobility and ability to fulfill their responsibilities as new mothers, threaten the continuity of breastfeeding (especially exclusive breastfeeding), disrupt nutritional status, and affect the interaction between mother and baby due to fatigue, weakness, and pallor. Postpartum anemia is associated with postpartum depression, lactation failure, and infectious diseases. Previous research indicates a difference in hemoglobin levels before and after normal delivery in anemic postpartum mothers, showing a decrease of 0.7 g%. This is attributed to blood loss during the delivery process (Fajri, 2020).

The daily iron (Fe) requirement for postpartum mothers is 2 mg; however, in cases of anemia, a higher iron intake is necessary to restore hemoglobin levels to normal and subsequently meet daily nutritional needs. In this community service activity, the provision of snakehead fish nuggets at a rate of 100 grams/day for 14 days, which contains 2.95 mg of Fe per 100 grams, can help increase hemoglobin levels and meet the nutritional needs of anemic postpartum mothers.

c. Demonstration of Making Snakehead Fish Nuggets

**Figure 1. Demonstration of Making Snakehead Fish Nuggets**

Snakehead fish has the highest albumin content compared to other fish. Albumin is a type of protein that plays an important role in transportation within the body. A lack of protein intake can hinder iron transport, leading to iron deficiency.

The composition of the snakehead fish nuggets provided to postpartum mothers who are breastfeeding per 100 grams includes: Carbohydrates 9.12 g, Protein 18.66 g, Albumin 2.28 g, Fat 13.76 g, Calcium 81.59 mg/kg, Iron 2.95 mg/kg, and Zinc 6.70 mg/kg. The protein contained in

snakehead fish nuggets is highly nutritious, easily digestible, and can aid in muscle tissue formation. Protein from snakehead fish also helps improve the quality of breast milk.

**Figure 2. Process of Making Snakehead Fish Nuggets**

The following ingredients are needed to make snakehead fish nuggets:

1) Snakehead fish 60 grams
2) Wheat flour 10 grams
3) Red beans 20 grams
4) Egg white 10 grams
5) Breadcrumbs 5 grams
6) Salt to taste (¼ tsp)
7) Chicken egg 5 grams
8) Carrot 10 grams
9) Garlic 5 grams
10) Green onions 3 grams
11) Shallots 5 grams
12) Celery 3 grams
13) Oil 7 grams

Instructions:

1) Clean the snakehead fish and steam it. While steaming, collect the fish extract. Once cooked, remove the flesh and separate it from the bones.
2) Mix in grated carrot, mashed red beans, wheat flour, minced shallots and garlic, chopped green onions, egg, egg white, and salt.
3) Prepare a steamer, pour the nugget mixture into a greased mold, and steam for about 20 minutes.

4) Cut the nuggets into 50 g pieces, then roll the nugget pieces in breadcrumbs. The nuggets are now ready to be fried; to prolong their shelf life, store them in the refrigerator.

## Outcomes Achieved

1. Outcomes

   The expected outcomes from this community service project are:

   a. Mandatory Outcomes

      1. Scientific article published in the national journal of Community Service, Gemassika.
      2. Increased understanding and skills within the community.

   b. Additional Outcomes

      Intellectual property, patents, copyrights, trademarks, trade secrets, industrial design, and product protection.

2. Achievement Targets

The target for this activity is to enhance knowledge about protein-rich nutritional intake and factors that can inhibit iron absorption. Additionally, participants will learn how to make snakehead fish nuggets that are easy to store and practical for daily consumption to meet the protein needs of postpartum mothers.

## CONCLUSION

The conclusion of this community service project indicates that postpartum mothers have improved their understanding of the importance of protein-rich nutritional intake and the factors that can inhibit iron absorption. Additionally, the provision of snakehead fish nuggets for 14 days has proven effective in increasing hemoglobin levels in postpartum mothers experiencing anemia. This activity also empowers these mothers to independently make snakehead fish nuggets, making the product more practical, easy to store, and consumable daily to meet their protein needs.

The recommendation from this study is for health workers to provide adequate information to postpartum mothers regarding nutritional fulfillment during the postpartum and breastfeeding periods, particularly concerning iron needs to prevent anemia. Furthermore, postpartum and breastfeeding mothers are encouraged to pay more attention to the nutritional value of the foods they consume to optimally meet their nutritional needs.

## DAFTAR PUSTAKA

Dayanthi, D. P. N. P. (2020). Pengaruh Pemberian Nugget Ikan Gabus terhadap Kadar Haemoglobin (Hb) pada Ibu Menyusui di Wilayah Kerja Puskesmas Mandala Medan. *Dspace Respository*, *10*(1), 54–75.

Fajri, N. umi ; dkk. (2020). Ekstrak Ikan Gabus (Channa Striata) untuk Meningkatkan Kadar Hemoglobin pada Ibu Nifas Anemia di RSUD Hj.Anna Lasmanah Banjarnegara. *Medsains*, *6*(02), 37–41. https://www.jurnal.polibara.ac.id/index.php/medsains/article/view/183/120

Haryanti, S. Y. (2019). Anemia Dan Kek Pada Ibu Hamil Sebagai Faktor Risiko Kejadian Bayi Berat Lahir Rendah (Bblr) Di Wilayah Kerja Puskesmas Juwana Kabupaten Pati. *Jurnal Kesehatan Masyarakat (e-Journal)*, *7*(1), 322–329.

Lipoeto, N. I., Masrul, & Nindrea, R. D. (2020). Nutritional contributors to maternal anemia in Indonesia: Chronic energy deficiency and micronutrients. *Asia Pacific Journal of Clinical Nutrition*, *29*(December), 9–17. https://doi.org/10.6133/APJCN.202012_29(S1).02

Retnaningtyas, E., & Siwi, R. P. Y. (2020). Analisis Kejadian Anemia Dan Kek Pada Ibu Hamil Terhadap Kejadian Bblr Di Rsud Gambiran Kediri. *... on Innovation and ...*, *Ciastech*, 1073–1080. http://publishing-widyagama.ac.id/ejournal-v2/index.php/ciastech/article/view/2010