JUKEKE Jurnal Kesehatan dan Kedokteran
OPEN ACCESS
JUKEKE Vol 4 No. 3 | October 2025 | ISSN: 2829-0437 (print), ISSN: 2829-050X (online), Hal 09-15

Effectiveness of TTD and MMS Supplementation in Preventing Anemia in Pregnant Women in the Working Area of the Moncongloe Community Health Center, Maros Regency

Erni Moilis[1], Hardyanty Subair[2*]
Nutrition, Faculty of Nursing and Midwifery, Megarezky University

Article History
Received : September 2, 2025
Revised : September 10, 2025
Accepted : September 18, 2025
Available Online : September 22, 2025

Corresponding author*:
hardyantysubair123@gmail.com

Cite This Article:
Subair, H., & Erni Moilis. (2025). Effectiveness of TTD and MMS Supplementation in Preventing Anemia in Pregnant Women in the Working Area of the Moncongloe Community Health Center, Maros Regency. *Jurnal Kesehatan Dan Kedokteran*, *4*(3), 09–15.

DOI:
https://doi.org/10.56127/jukeke.v4i3.2303

Abstract: Nutritional problems in pregnant women remain a major challenge in Indonesia. One of the most serious problems is anemia due to iron deficiency. According to the 2018 Riskesdas results, nearly half of pregnant women in Indonesia experience this condition. Anemia can cause various problems, such as premature birth, low birth weight, and even maternal death. The purpose of this study was to determine the comparative effectiveness of Iron Supplement Tablets (TTD) and Multiple Micronutrient Supplements (MMS) in increasing hemoglobin (Hb) levels in pregnant women. Research method This study was a quantitative observational study with a cross-sectional approach. The research design used a comparative approach, namely by comparing hemoglobin levels in pregnant women who consumed Iron Supplement Tablets (TTD) and those who consumed Multiple Micronutrient Supplements (MMS) in the first and third trimesters.The results showed that hemoglobin levels in pregnant women who consumed Multiple Micronutrient Supplement (MMS) were higher than those in the group who consumed Iron Supplement Tablets (TTD). This difference can be explained based on the nutritional content of each supplement. In conclusion, the administration of multiple micronutrient supplements (MMS) proved to be more effective in increasing hemoglobin levels in pregnant women than administering iron tablets (TTD) alone.

Keywords: Anemia, TTD, MMS

INTRODUCTION

Nutritional problems in pregnant women remain a major challenge in Indonesia. One of the most serious problems is anemia due to iron deficiency. According to the results of the Riskesdas, nearly half of pregnant women in Indonesia experience this condition. Anemia can cause various problems, such as premature birth, low birth weight, and even maternal death. According to Prof. Hardinsyah, iron requirements increase significantly during pregnancy, and if these requirements are not met, it can gradually affect fetal growth and development.

According to data from the 2023 Indonesian Health Survey (SKI), the incidence of anemia in pregnant women reached 27.7%. Compared to data from the 2018 Basic Health Research (Riskesdas), there was a decrease of 21.2%, from 48.9% to 27.7%. (SKI 2023)

Data obtained from the Maros District Health Office shows that in 2020, 92.15% of pregnant women visited health centers, with 25.8% of them experiencing anemia. In 2021, the percentage of visits by pregnant women rose to 94.8%, with anemia cases reaching 27.3%. In 2022, the number of visits by pregnant women increased again to 97.4%, and anemia cases reached 28.3% (Maros District Health Office Profile, 2022).

Based on information from the Ministry of Health, the MMS program was officially launched in 2024 and is targeted to be implemented in 209 districts/cities in 15 provinces, including South Sulawesi. A total of 1.3 million bottles of MMS, each containing 180 tablets, have been prepared for distribution to pregnant women in these areas. The selection of these areas is based on the incidence of low birth weight (LBW), pregnant women with chronic energy deficiency (CED), stunting, dense populations, and the large number of pregnant women targeted. However, there is currently no official information specifically mentioning the names of Community Health Centers (Puskesmas) in Makassar City that have implemented the Multiple Micronutrient Supplement (MMS) program for pregnant women.

The study at the Mulyorejo Community Health Center in Surabaya involved 24 pregnant women in their second trimester. The results showed that the level of compliance in consuming MMS and TTD was not significantly different. However, the level of compliance was greatly influenced by the mothers' level of knowledge and the support provided by their families. This study emphasizes that external factors are very important in the success of nutritional supplementation programs (Abidah & Sumarmi 2024).

RESEARCH METHODOLOGY

This study is a quantitative observational study with a cross-sectional approach. The research design uses a comparative approach, namely by comparing hemoglobin levels in pregnant women who consume Iron Supplement Tablets (TTD) and those who consume Multiple Micronutrient Supplements (MMS) in the first and third trimesters. This study does not provide direct treatment, but uses secondary data from the health records of pregnant women at the Community Health Center (Puskesmas).

Research Location and Time

1. Research Location

This study was conducted at the Moncongloe Community Health Center, Maros Regency.

2. Research Time

The research was conducted in July 2025.

Research Population and Sample

1.Population

The population is a collection of all objects or subjects to be studied. In this study, the population consists of all pregnant women in the working area of the Moncongloe Community Health Center, totaling 119 people.

2. Sample

The sampling technique used in this study is purposive sampling. According to Sugiyono and Lestari (2021), purposive sampling is a method of selecting samples based on specific considerations. A sample is a part of the population to be studied. To calculate the sample in this study, the Slovin formula was used. The following is the Slovin formula:

$$n = \frac{N}{1 + N(e)^2}$$

Sample size

The sample studied in this research consisted of 55 people.

3. Sample Criteria

Inclusion Criteria

1. Pregnant women in their third trimester
2. Residing in the Moncongloe Community Health Center service area
3. Have recorded hemoglobin levels in the first trimester and in the third trimester
4. Consumed one of the supplements being studied (TTD or MMS) during pregnancy

Exclusion Criteria

1. Pregnant women with a history of chronic disease
2. Pregnant women who consumed both types of supplements (TTD and MMS) simultaneously
3. Incomplete hemoglobin test data or supplement consumption records

How to determine the sample size in research based on the Slovin formula, namely:

$$n = \frac{N}{1 + N(e)^2}$$

$$n = \frac{128}{1+128\,(0,1)^2}$$

$$n = \frac{128}{1+\,128\,(0,01)} = \frac{128}{2,28} = 56,14$$

Explanation:
n = Sample Size
N = Total Population
e = Critical Value or Error Tolerance Limit

In the Slovin formula, there are two conditions for determining the error tolerance, namely:

1. Value e = 10% (0.1) if the population is large
2. Value e = 20% (0.2) if the population is small

Therefore, the sample used in this study consisted of 56 pregnant women.

RESULTS AND DISCUSSION

1. Univariate Analysis

Univariate analysis was conducted to determine the general distribution of frequencies and percentages of each variable in the study. In this study, univariate analysis was used to understand the characteristics of respondents, such as age, trimester of pregnancy, and parity.

Table 4.1 Analysis of Respondent Characteristics

Characteristics	Category	Number	Anemia (Hb <11 g/dL)	Normal (Hb ≥ 11 g/dL)	Percent %
Mother's age	<20 years	3	1	2	5.5
	20-35 years	44	20	25	81.8
	>35 years old	6	4	2	12.7%
Total		**54**	**25**	**29**	**100.0%**
Age Pregnancy	First trimester	36	2	35	67.3
	Third trimester	18	11	6	32.7
Total		**54**	**13**	**41**	**100.0%**
Parity	Primipara	30	4	26	56.4
	Multipara	22	8	14	40.0%
	Grande multipara	2	1	1	3.6%
Total		**54**	**13**	**41**	**100.0%**

Secondary data 2025

The results of the study in the table of respondent characteristics in the age column show that there were 3 pregnant women under the age of 20, 44 pregnant women aged 20-35, and 7 pregnant women over the age of 35. Of the above categories of pregnant women, the category with the most anemia was the 20-35 age group, with 20 people.

Furthermore, in the pregnancy age column, there were 36 pregnant women in their first trimester, 2 of whom had anemia, and 18 pregnant women in their third trimester, 12 of whom had anemia.

Finally, in the parity column, there were 30 primiparous pregnant women, 4 of whom had anemia, while there were 22 multiparous pregnant women, 8 of whom had anemia, and there were 2 grandemultiparous pregnant women, some of whom had normal Hb levels and some of whom had anemia.

2. Bivariate Analysis

Table 4.2 Analysis of Hb Levels in the First and Third Trimesters

Period	Supplementation	Number	Average Hb Levels	Hb Levels Minimum	Hb Level Maximum	Percent %
First trimester	TTD	27	10.53	10.0 g/dL	11.5 g/dL	26.7%
	MMS	27	11.17	9.7 g/dL	12.7 g/dL	73.3%
	Total	**54**				100.0%
Trimester 3	TTD	27	10.53	8.7 g/dL	11.6 g/dL	26.7
	MMS	27	11.64	10.9 g/dL	13.6 g/dL	73.3
	Total	**54**				100.0%

Secondary Data 2025

the bivariate analysis above, 27 pregnant women consumed iron tablets (TTD) in the first and third trimesters, with an average Hb level in the first and third trimesters of 10.53 g/dL, while 27 pregnant women consumed multiple micronutrient supplements (MMS) in the first and third trimesters, with an average Hb level in the first trimester of 11.17 g/dL and an increase in the third trimester to 11.64 g/dL.Supplement administration of TTD and MMS was based on the mother's gestational age when she visited the health center for prenatal care. Pregnant women who came for prenatal care in the first trimester were given MMS, while those who came in the second trimester were given

Conclusion

Based on the results of this study, it can be concluded that:

1. The administration of Multiple Micronutrient Supplements (MMS) has been proven to be more effective in increasing hemoglobin levels in pregnant women compared to administering Iron Tablets (TTD) alone.
2. Following MMS intervention, the number of pregnant women with normal Hb levels increased significantly, while the increase in the TTD group was smaller.
3. This study indicates that providing MMS as a supplement may be a better option in efforts to prevent anemia in pregnant women.

Recommendations

1. For Health Workers
   a It is recommended to consider administering MMS as an option or additional aid to TTD in programs to prevent anemia in pregnant women.
   b Increasing understanding of the importance of taking supplements appropriately during pregnancy.
2. For Pregnant Women
   a. It is hoped that pregnant women will follow the instructions of health workers in taking supplements, whether provided by TTD or MMS, and continue to maintain a nutritious and balanced diet.

REFERENCES

Abidah, N., & Sumarmi, S. (2024). *The effectiveness of micronutrient supplementation on hemoglobin status in second trimester pregnant women*. Surabaya: Surabaya State University.

Allen, L. H. (2000). Anemia and iron deficiency: Effects on pregnancy outcome. *The American Journal of Clinical Nutrition*, 71(5 Suppl), 1280S–1284S. https://doi.org/10.1093/ajcn/71.5.1280s

Black, R. E., Victora, C. G., Walker, S. P., Bhutta, Z. A., Christian, P., de Onis, M., ... & Uauy, R. (2013). Maternal and child undernutrition and overweight in low-income and middle-income countries. *The Lancet,* 382(9890), 427–451. https://doi.org/10.1016/S0140-6736(13)60937-X

Health Research and Development Agency. (2018). *2018 National Riskesdas Report*. Jakarta: Ministry of Health of the Republic of Indonesia.

Cunningham, F. G., Leveno, K. J., Bloom, S. L., Dashe, J. S., Hoffman, B. L., Casey, B. M., & Sheffield, J. S. (2022). *Williams Obstetrics* (26th ed.). New York: McGraw-Hill Education.

Makassar City Health Department. (2023). *Makassar City Health Profile 2022*. https://dinkes.makassarkota.go.id

Maros District Health Office. (2020). *Maros District Health Profile 2020*. https://dinkes.maroskab.go.id

Cunningham, F. G., Leveno, K. J., Bloom, S. L., Dashe, J. S., Hoffman, B. L., Casey, B. M., & Sheffield, J. S. (2018). *Williams Obstetrics* (25th ed.). New York: McGraw-Hill Education.

Ministry of Health of the Republic of Indonesia. (2015). *Guidelines for the administration of iron tablets for adolescent girls and women of childbearing age*. Jakarta: Directorate General of Nutrition and Maternal and Child Health.

Manuaba, I. B. G. (2010). *Obstetrics, gynecology, and family planning for midwifery education*. Jakarta: EGC.

Prawirohardjo, S. (Ed.). (2016). *Obstetrics*. Jakarta: Sarwono Prawirohardjo Foundation.

Scholl, T. O., & Hediger, M. L. (1994). Anemia and iron-deficiency anemia: Compilation of data on pregnancy outcome. *The American Journal of Clinical Nutrition*, 59(2 Suppl), 492S–500S. https://doi.org/10.1093/ajcn/59.2.492S

Ramakrishnan, U., Manjrekar, R., Rivera, J., Gonzales-Cossio, T., & Martorell, R. (1999). Micronutrients and pregnancy outcome: A review of the literature. *Nutrition Research,* 19(1), 103–159. https://doi.org/10.1016/S0271-5317(98)00117-2

Saifuddin, A. B. (Ed.). (2022). *Midwifery textbook*. Jakarta: Yayasan Bina Pustaka Sarwono Prawirohardjo.

Wibowo, Y., Rohmawati, A., & Fitriana, R. (2022). Effect of multiple micronutrient supplementation compared to iron–folic acid on maternal hemoglobin and birth outcomes: A study in Indonesian pregnant women. *Journal of Maternal and Child Health*, 7(2), 115–123. https://doi.org/10.26911/thejmch.2022.07.02.03

World Health Organization. (2020). *WHO antenatal care recommendations: Multiple micronutrient supplements during pregnancy*. Geneva: World Health Organization. https://www.who.int/publications/i/item/9789240007786