

Examining the Implementation of Blood Supplement Tablet Policy as a Strategy for Stunting Prevention: Insights from High and Low Coverage Health Centers in Medan City



Nasrin Nabila¹ and Helen Andriani^{2,*}

¹Master of Public Health Study Program, Faculty of Public Health, Universitas Indonesia, Depok, Indonesia

²Department of Health Policy and Administration, Faculty of Public Health, Universitas Indonesia, Depok, Indonesia

Abstract:

Background: The program to provide and ensure a minimum of 90 blood supplement tablets (BSTs) during pregnancy has been successful in preventing and treating iron deficiency anemia among pregnant women.

Objective: This study offers critical insights into the implementation of the BST policy in Medan City as part of a broader strategy to combat stunting among pregnant women.

Methods: Through qualitative methods, including in-depth interviews, focus group discussions, and document analysis, the study identified key factors influencing policy execution: communication, resources, disposition, bureaucratic structure, and the socio-economic environment. Notably, effective communication across multiple channels emerged as a cornerstone, ensuring that stakeholders, community health workers, and pregnant women were well-informed about BST availability and usage.

Results: The research highlights the adequacy of resources, including human resources and infrastructure, but notes challenges, such as dual roles for staff and short BST expiration periods, which complicate distribution. A lack of specific standard operating procedures (SOPs) for BSTs was identified as a gap, with existing guidelines embedded within broader antenatal care frameworks. Additionally, while coordination among sectors is ongoing, data integration and reporting mechanisms remain fragmented, hampering program monitoring and evaluation. Community involvement, particularly through health cadres and field assistance, significantly influenced pregnant women's compliance with BST consumption. However, economic disparities were found to affect access, with middle-to-upper-class women often bypassing public health centers in favor of private providers, creating data collection challenges.

Conclusion : These findings underscore the need for targeted improvements, including an integrated reporting system, enhanced SOPs, and more robust coordination mechanisms. By addressing these gaps, this study provides a framework for refining health interventions, demonstrating the critical interplay between communication, resources, and community engagement in achieving sustainable policy outcomes.

Keywords: Policy implementation, Blood supplement tablets, Pregnant women, Anemia, Stunting, Antenatal care.

© 2025 The Author(s). Published by Bentham Open.

This is an open access article distributed under the terms of the Creative Commons Attribution 4.0 International Public License (CC-BY 4.0), a copy of which is available at: <https://creativecommons.org/licenses/by/4.0/legalcode>. This license permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

* Address correspondence to this author at the Department of Health Policy and Administration, Faculty of Public Health, Universitas Indonesia, Depok, Indonesia; E-mail: helenandriani@ui.ac.id

Cite as: Nabila N, Andriani H. Examining the Implementation of Blood Supplement Tablet Policy as a Strategy for Stunting Prevention: Insights from High and Low Coverage Health Centers in Medan City. Open Public Health J, 2025; 18: e18749445379272. <http://dx.doi.org/10.2174/0118749445379272250316081326>



CrossMark

Received: December 29, 2024

Revised: February 17, 2025

Accepted: February 19, 2025

Published: April 03, 2025



Send Orders for Reprints to
reprints@benthamscience.net

1. INTRODUCTION

Anemia has various causes, including iron deficiency, vitamin B12 deficiency, folic acid deficiency, infectious diseases, congenital factors, and bleeding [1]. Anemia in

pregnancy impacts the optimal growth and development of the fetus and may cause complications of pregnancy and childbirth, even the death of the mother or child. The prevalence of anemia in pregnant women is 40%

worldwide and 48.9% in Indonesia. The World Health Organization has recommended that daily blood supplement tablets (BSTs) containing 30–60 mg of iron with 400 g of folic acid be given to pregnant women during the first trimester or as soon as possible and when they attend pregnancy checks [2]. A program to provide BSTs to pregnant women began in 1990, aiming to prevent and treat iron deficiency anemia and serve as a specific intervention to accelerate stunting reduction. To prevent anemia, pregnant women are expected to consume at least 90 BSTs during pregnancy [2].

The COVID-19 pandemic has led to many changes to the implementation of health service policies, including the provision of BSTs to pregnant women during antenatal care (ANC) visits at health services [3]. According to Riskesdas data for 2018 [4], the area with the lowest proportion of pregnant women receiving BSTs was the province of North Sumatra at 56.4%. This increased in 2021 to 77.93%. The Indonesia Nutrition Status Survey (SSGI) 2021 [5] data show that the province with the lowest proportion of pregnant women receiving BSTs was also North Sumatra (80.1%).

Medan City, the capital of North Sumatra province, has the largest population among all districts and cities in Sumatera Island, Indonesia, but the lowest economic growth rate. Medan City is also one of the cities included as a focus location for integrated stunting reduction interventions set by the Minister of National Development Planning. Although the provision of BSTs in Medan City has increased, the number of maternal deaths per 100,000 live births in Medan City shows an increasing trend from 6 cases in 2016 to 19 cases in 2020 [6].

This article examines the implementation of a policy aimed at ensuring pregnant women in Medan City receive a minimum of 90 BSTs during pregnancy. Additionally, it evaluates the program's impact on preventing iron deficiency anemia and its broader role in reducing stunting. The findings are intended to guide targeted improvements in policy execution and provide insights into the interplay between communication, resources, and community involvement in public health interventions.

2. MATERIALS AND METHODS

This non-experimental research used a qualitative approach and a case study design. It focused on the implementation of the BSTs policy for pregnant women in Medan City. The research was conducted in May–June 2023 in Medan City, North Sumatra. From Medan City, a total of 21 sub-districts, including the health center with the lowest BST coverage, Medan Johor Community Health Center, and the center with the highest BST coverage, Glugur Darat Community Health Center, were selected. This selection was used to determine whether differences existed in the implementation of BST policies for pregnant women in Medan City. Informants were selected by purposive sampling, with researchers choosing individuals and places that most assisted them in achieving the research goals, relying on informants with relevant insights. In line with qualitative research principles, the

adequacy of the sample was justified by data saturation, where no new significant information emerged from additional participants.

The methods used in this qualitative research were in-depth interviews and focus group discussions (FGDs). The outcomes of these FGDs provided valuable insights into the challenges, perceptions, and experiences of the participants in accessing and utilizing BSTs within their respective areas. Interviews related to the implementation of BSTs for pregnant women were conducted with stakeholder informants, such as the Head of the North Sumatra Provincial Health Office, the Head of the Medan City Health Service, the manager of the nutrition program at the Medan City Health Office, the head of the community health center, and the coordinating midwife. FGDs were conducted with BST, nutrition cadres, and pregnant women. Document review was also carried out of the routine reports of the Medan health center and health office. The documents reviewed include those related to resources (midwives, cadres, and the BST), standard operating procedures (SOPs) for policy implementation, and reports on the implementation of the BST program. Books and regulations related to the implementation of the BST program in Medan City were also reviewed.

This study included 17 informants (6 pregnant women, 4 cadres, 2 coordinating midwives, 2 heads of community health centers, and the heads of the Medan City Health Office Nutrition Program, Medan City Health Office, and North Sumatra Provincial Health Office). The data were collected and analyzed before the researchers drew conclusions, suggestions, and policy recommendations based on the qualitative results.

The basis for selecting informants from Table 1 was adjusted to the main tasks and functions of each position. These informants are representatives of regional apparatuses who play a role in the implementation of BST policies for pregnant women in Medan City. Provincial and City Health Offices play a role as the leading sector in policy implementation. The executors implementing the policy in the field are the community health centers as the technical implementation units of the Health Offices.

In addition to in-depth interviews, the researchers conducted the FGDs, as shown in Table 2, with 10 informants, comprising 2 nutrition and family planning cadres and 3 pregnant women receiving BSTs from each of 2 selected community health center work areas: Glugur Darat and Medan Johor community health centers. The research locations were Glugur Darat Community Health Center, which had the highest BST achievement, and Medan Johor Community Health Center, which had the lowest achievement. While this selection limits the scope of data to two health centers, it provides focused and comparative insights into the factors influencing BST implementation. This approach is suitable for identifying patterns and drawing conclusions relevant to other settings with similar characteristics, acknowledging that broader generalizations may require further studies across diverse regions.

Table 1. Description of in-depth interview informants.

No	Informant Code	Position	Institution	Length of Work
1	I1	Head of Public Health	Provincial Health Office	17 years
2	I2	Head of Public Health	City Health Office	21 years
3	I3	Head of the Nutrition Health Team	City Health Office	20 years
4	I4	Head of Community Health Center	Glugur Darat	20 years
5	I5	Head of Community Health Center	Medan Johor	17 years
6	I6	Coordinator midwife	Glugur Darat	32 years
7	I7	Coordinator midwife	Medan Johor	14 years

Table 2. Description of the FGD informants.

No	Informant Code	Job	Community Health Center	Length of work/ Gestational Age
1	F1	Cadre	Glugur Darat	37 years
2	F2	Cadre & Entrepreneur	Glugur Darat	8 years
3	F3	Housewife	Glugur Darat	6 months
4	F4	Housewife	Glugur Darat	5 months
5	F5	Housewife	Glugur Darat	8 months
6	F6	Cadre & Entrepreneur	Medan Johor	1 year
7	F7	Cadre	Medan Johor	1 month
8	F8	Housewife	Medan Johor	6 months
9	F9	Housewife	Medan Johor	9 months
10	F10	Housewife	Medan Johor	6 months

3. RESULTS

The policy of giving BSTs to pregnant women in Medan City has long been implemented and was considered good by informants. The number of BSTs given to health centers was large, with a short expiry time (1 year). This sometimes led to stockpiling with cadres for distribution to mothers, including breastfeeding mothers and teenage daughters. From the pregnant women's perspective, the implementation was also deemed effective. BSTs were initially provided during early pregnancy checks at health centers. After receiving BSTs, women generally consumed them immediately. If complaints arose, they consulted health workers before resuming consumption.

"It's good, ma'am; I was given it when I first went to the health center. I was 2 weeks pregnant at that time, and then I immediately took it every day because if I didn't take it, I felt like I was dizzy, ma'am," F8.

3.1. Communication

Based on the informant interviews, the policy has been conveyed to stakeholders in stages from the center, province, city, and health center to cadres and the community. According to the informants, the information provided was good because the program has been implemented for a long time, and the strategy used was sufficient, involving cross-checking the data:

"Counseling and going to the integrated health post is always given, and information is provided. There is also a cross-check from the MCH [maternal and child health] book; whether it has been checked or not, we also check from there," I7.

The monitoring and evaluation of the policy were carried out by the community health center and the health office.

3.2. Resources

The results of the in-depth interviews and FGDs with informants revealed that human resources were sufficiently fulfilled and had good abilities, although staff were working dual roles:

"On average, we have double roles here. Human resources are not lacking, but it's just the division of work that needs to be looked at again," I7.

No specific BST cadres exist; instead, Integrated Health Post (Posyandu) cadres monitor MCH, especially toddlers. These cadres are supported by coordinating midwives at their community health centers. Cadres are selected annually by sub-districts and formalized through decrees. The BST budget is sourced from the regional income and expenditure budget, with BSTs sent directly from the province to the city health office and then to community health centers. Full authority is granted to program implementers to distribute BSTs to pregnant women, with infrastructure and availability deemed sufficient.

3.3. Disposition

According to the informants, the BST implementation does not require any more orders from the leadership because it is already running routinely:

"We don't have a disposition anymore; we already know each other's jobs", I3.

If there must be a disposition, it will not last long. Incentives for cadres are provided by the municipal government.

3.4. Bureaucratic Structure

There is no specific SOP for administering BSTs; instead, BST administration is included within the broader SOP for ANC services. Cadres operate without an SOP as the process has been long-established. Coordination occurs seamlessly across all levels of bureaucracy:

"If there is no SOP specifically for BSTs, there is only one for MCH services, ma'am (I6). The most coordination is with the community health center, ma'am", F6.

3.5. Economic, Social, and Political Environment

In general, economic status influences the consumption of BSTs. Women of middle to upper economic status tend not to have their pregnancies checked at the community health center, so it is difficult for the community health center to obtain data on their target coverage:

"Usually, the biggest obstacle is that if you are economically challenged, you don't want to tell us about your own treatment," F1.

There are no political aspects directly related to the provision of BSTs. However, during working visits, members of the Indonesian House of Representatives (DPR) usually invite the community health center to conduct counseling or outreach:

"DPR recesses usually require representatives from the health department to provide outreach to the public," I3.

5. DISCUSSION

The study employs a comprehensive approach to policy analysis, examining multiple factors, such as communication, resource adequacy, and socio-economic environment. This multidimensional framework provides a well-rounded understanding of the strengths and challenges of the policy. The long-standing implementation of the BST policy for pregnant women in Medan City has generally been viewed positively, reflecting its integration into routine healthcare practices across various touchpoints, such as health checks, education sessions, and community outreach programs.

Research at the Jepara Health Center stated that the implementation of BSTs for pregnant women experienced problems at the beginning of the COVID-19 pandemic in terms of communication, lack of support from the head of the community health center, and no SOP changes. However, in Medan City, during the pandemic, the administration of BST was still well-implemented. This was because the community health center continued to operate, and the integrated health post continued to operate according to the health protocol [7, 8]. This is in line with research that stated that ANC services and BST distribution during the COVID-19 pandemic were still carried out with certain strategies in accordance with

established policies and considering health protocols [9, 10]. The distribution of BSTs is carried out in various ways, including when pregnant women visit health services (community health centers and their networking), with due observance of health protocols. Families of pregnant women can also take the BSTs if conditions allow [11].

The obstacles faced include issues with recording and reporting, which have not been integrated. The Medan Johor Community Health Center's low BST achievement is also due to the fact that the data have not yet been entered into the system, and the data on the number of pregnant women from the Data and Information Technology Center rely on predictive data rather than real field data. This data gap makes it difficult for health workers to meet targets.

Communication is a process of conveying information from the communicator to the communicant [9]. In Medan City, the transmission of information about BSTs to pregnant women has not only been conveyed to policymakers, but also to the target group and related parties. This communication is delivered in stages from the center (Ministry of Health), Provincial Health Office, City Health Office, and community health centers to cadres and the community through both outreach and direct education. Effective communication across stakeholders, including health workers, community members, and pregnant women, is highlighted as a cornerstone of the program. This focus underscores the importance of information dissemination in public health initiatives, offering actionable insights for similar programs.

The long-standing implementation of the program, coupled with the use of strategies, such as cross-checking data, has contributed to its perceived effectiveness. However, challenges remain regarding the sustainability of these practices. While the longevity of the program has facilitated familiarity and routine among implementers, it has not fully addressed the variability in implementation effectiveness observed during the COVID-19 pandemic. Research at the Jepara Health Center highlighted that inconsistencies in program outcomes were often tied to gaps in the clarity of information and stakeholder engagement. This underscores the need for continuous improvement in communication strategies and stakeholder alignment to ensure equitable and effective policy delivery across varying contexts [12]. Socialization through mass campaigns is given to increase the compliance of pregnant women in taking iron and folic acid tablets [13, 14]. Pregnant women need to be given socialization so that they become aware and willing to take iron and folic acid tablets in accordance with the midwife's recommendations. Health workers have a duty as communicators to provide information about anemia to pregnant women [15, 16]. Communication from health workers is needed to minimize the lack of knowledge and improve the attitudes of pregnant women towards their health by providing information [12]. The BST policy has involved no change in guidelines, and is still using the old

ones from 2015. Monitoring and evaluation of this policy are carried out by the community health center and the health office [17].

While human resources were deemed competent and adequately staffed, the dual roles of staff highlight a need for improved task allocation. This aligns with existing research emphasizing the importance of optimizing workforce competence at the input stage for effective program implementation [18].

BST cadres are those who work at integrated health posts and monitor all MCH. In carrying out their duties, these cadres are accompanied by coordinating midwives at the community health center in their working area. At the city level, there are no more proposals for BST's budget because the province has already sent BSTs directly to the city health office and then forwarded them to the community health center. Almost the entire budget was refocused during the COVID-19 pandemic. This is in line with research stating that the source of funds for the BST program comes from the regional income and expenditure budget [18-20].

To enhance effectiveness of empowering community health centers and cadres, it is critical to ensure multisectoral government support and foster collaborations between the government and community stakeholders. Strengthening partnerships through evidence-based policy design can help optimize program delivery and sustainability, addressing systemic and operational challenges in maternal health initiatives [21]. This highlights the importance of grassroots engagement in achieving health policy objectives.

The infrastructure and availability of BST were considered sufficient. This is not in line with research, where the supply of BST was inadequate, facilities and infrastructure were inadequate, and counseling guidance, relevant materials, and information media were still lacking [21].

The disposition of policy implementers reflects their attitude and commitment, shaped by leadership support and incentives. The BST program operates routinely without requiring additional directives from leadership. However, the lack of specific SOPs for BST, as opposed to broader MCH services, highlights a gap in formalized procedures. This reliance on unwritten norms contrasts with studies emphasizing the need for clear SOPs to ensure consistent implementation. Furthermore, deficiencies in analysis, follow-up, and feedback mechanisms suggest opportunities for enhancing program evaluation and refinement. These insights underline the importance of structured guidance and systematic oversight for sustaining program effectiveness [21].

In general, the economic status of the people receiving BSTs affected their consumption. Middle- and upper-class status makes pregnant women reluctant to seek treatment at primary health care centers, going directly to specialists and private hospitals. The vulnerable life stages, such as the female reproductive period, childhood, and later life, and adverse socioeconomic conditions are

associated with a high prevalence of nutritional anemia, including iron deficiency [17, 21, 22]. The involvement of community leaders and religious leaders in Medan greatly influenced the success of the program. The implementation of a community-based approach increases adherence to iron and folic acid tablets [23-26].

The implementation of the BST policy for pregnant women in Medan City is influenced by numerous variables. This study used a combination of Edward III's theory alongside the theories of Van Meter and Van Horn."

Furthermore, policy implementation is influenced by resources, communication, and the environment.

Resources are influenced by communication and bureaucratic structure (coordination). These resources include human resources, budget, authorities, and facilities. The budget comes from the regional income and expenditure budget, with no need to carry out the submission process [27]. The involvement of stakeholders from across sectors is needed in implementing the policy, so each party must have clear authority. Each implementer of the policy already has their authority in accordance with their respective duties and functions.

The economic environment of middle- and upper-middle-class women usually makes them check their pregnancies at clinics and facilities other than the community health center, so officers find locating the data difficult. The social environment, in this case, the community, is the target of the policy, so good acceptance and understanding are also needed concerning related policies and programs being implemented. This can be seen from community leaders being involved in program implementation.

The integration of the BST policy into broader MCH services reflects its critical role in stunting prevention. Improvements in monitoring systems, SOP development, and resource allocation are necessary to enhance the program's effectiveness. Additionally, the involvement of community leaders and multisectoral collaboration can further strengthen adherence to iron and folic acid supplementation, ensuring sustainable outcomes in stunting reduction efforts [28-30].

The BST initiative aligns with Indonesia's national health priorities, such as reducing maternal mortality and stunting under the Indonesian National Medium-Term Development Plan and integrated stunting interventions in Medan City. It also supports global health goals, including the targets of Sustainable Development Goal 3 on maternal and child health, and complements existing maternal health programs like antenatal care and nutrition services. Strengthening this alignment through multisectoral collaboration and data integration can enhance program impact and sustainability.

This study has several limitations. It was conducted in only two community health centers in Medan City, which may limit the generalizability of the results to other regions with differing socioeconomic or health system characteristics. Additionally, the qualitative approach relies on self-reported data from informants, which may

introduce recall bias or subjective interpretations. The lack of integrated data systems and reliance on non-standardized operating procedures for BST distribution also pose challenges in drawing broader conclusions about the effectiveness of the policy. Furthermore, economic disparities and the tendency of middle- to upper-class women to seek care outside public health facilities limit the completeness of the data, potentially underestimating the true scope of BST implementation. These constraints underscore the need for integrating quantitative data caution in extrapolating the results and highlight areas for future research to validate and expand on these findings.

CONCLUSION

Although the BST policy for pregnant women in Medan City has been successfully implemented as a routine program, the need for the present study arises from critical gaps and challenges in policy execution. These include issues, such as short expiration periods of BSTs, dual roles of staff, lack of specific Standard Operating Procedures (SOPs) for BST distribution, and fragmented data integration systems. The implementation of digitalized reporting platforms and standardized protocols integrated with mobile apps for cadres to log and synchronize real-time data will ensure seamless data sharing and unified reporting across health facilities. Furthermore, economic disparities and social determinants impact BST coverage, particularly among middle- and upper-class women who often bypass public health centers. Nonetheless, the targeted recommendations for the sustainability, equity, and effectiveness of the program were optimized, ensuring that no group is left behind in accessing maternal health interventions.

AUTHORS' CONTRIBUTIONS

The authors confirm their contribution to the paper: Study conception and design: NN; data collection: NN; analysis and interpretation of results: NN and HA; draft manuscript: NN and HA. All authors reviewed the results and approved the final version of the manuscript.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

The Institutional Review Board (IRB) of Universitas Indonesia provided ethical review approval (287/UN2.F10.D11/PPM.00.02/2023).

HUMAN AND ANIMAL RIGHTS

All procedures performed in studies involving human participants were in accordance with the ethical standards of institutional and/or research committee and with the 1975 Declaration of Helsinki, as revised in 2013.

CONSENT FOR PUBLICATION

Informed consent was obtained from all subjects involved in the study.

AVAILABILITY OF DATA AND MATERIALS

Data are available upon request.

STANDARDS OF REPORTING

COREQ guidelines were followed.

FUNDING

This research was funded by the Directorate of Research and Development Universitas Indonesia, grant number NKB-211/UN2.RST/HKP.05.00/2023. The funders had no role in the design of the study, in the collection, analyses, or interpretation of data, in the writing of the manuscript, or in the decision to publish the results.

CONFLICT OF INTEREST

The authors declare no conflicts of interest.

ACKNOWLEDGEMENTS

The authors would like to acknowledge the North Sumatra Provincial Health Office, the Medan City Health Office, community health centers, the coordinating midwife, and the nutrition cadres for their valuable contributions to this study.

REFERENCES

- [1] Haemoglobin concentrations for the diagnosis of anaemia and assessment of severity. 2011. Available from: <https://www.who.int/publications/i/item/WHO-NMH-NHD-MNM-1.1.1>
- [2] Guidelines for providing iron supplements to pregnant women during the Covid-19 pandemic for health workers. 2020.
- [3] Sutanto S, Suwandi JF, Hayati K, Zuraida R, Sayekti WD. Important factors affecting the compliance of pregnant women with iron deficiency anemia during a pandemic. *Aisyah J Health Sci* 2021; 6(4): 809-16. <http://dx.doi.org/10.30604/jika.v6i4.758>
- [4] National Report of Riskesdas 2018. Health Research and Development Agency. 2018.
- [5] Pocket Book of Results of the Indonesian Nutritional Status Study (SSGI) at the National, Provincial, and Re-gency/City Levels in 2021 2021.
- [6] Medan City Regulation No. 7 of 2021 concerning the Medan City Medium-Term Development Plan for 2021-2026 *Prim Escritos* 2021; 11: 233-8.
- [7] Amieratunnisa A, Irene Kartasurya M, Zen Rahfiludin M. Analysis of the implementation of the pregnant women's blood supplement program during the covid-19 pandemic in the jepara regency health center area. *JKM* 2022; 9(2): 138-53. <http://dx.doi.org/10.31596/jkm.v9i2.735>
- [8] Hammad M, Fardoos S, Arif R, Khan AZ, Rasheed A. Factors related to anemia prevalence among women of childbearing age in the period of global pandemic. *Cureus* 2023; 15(5):e38491 <http://dx.doi.org/10.7759/cureus.38491> PMID: 37273341
- [9] Noviyana AP. Distribution of pregnant women's blood supplement tablets in the covid-19 pandemic era in banyumas regency. *NersMid J Nursing and Midwifery* 2021; 0231(1): 124-9.
- [10] Ahmed F, Al-Sumaie MA. Risk factors associated with anemia and iron deficiency among Kuwaiti pregnant women. *Int J Food Sci Nutr* 2011; 62(6): 585-92. <http://dx.doi.org/10.3109/09637486.2011.566848> PMID: 21561298
- [11] Helin TA, Lemponen M, Lahtiharju T, Koskinen M, Lassila R, Joutsu-Korhonen L. Anaemia and enhancement of coagulation are associated with severe COVID-19 infection. *Scand J Clin Lab Invest* 2021; 81(8): 653-60. <http://dx.doi.org/10.1080/00365513.2021.2001845> PMID: 34793272
- [12] Rahman FF. Introduction to Public Health Management,

- Organization and Policy. Yogyakarta: Deepublish 2020.
- [13] Beressa G, Lencha B, Bosha T, Egata G. Utilization and compliance with iron supplementation and predictors among pregnant women in Southeast Ethiopia. *Sci Rep* 2022; 12(1): 16253.
<http://dx.doi.org/10.1038/s41598-022-20614-9> PMID: 36171347
 - [14] Birhanu TM, Birarra MK, Mekonnen FA. Compliance to iron and folic acid supplementation in pregnancy, Northwest Ethiopia. *BMC Res Notes* 2018; 11(1): 345.
<http://dx.doi.org/10.1186/s13104-018-3433-3> PMID: 29848380
 - [15] Herdalen N, Rosyada A. Determinants of maternal compliance in consuming fe tablets during pregnancy in Indonesia (Secondary Data Analysis of Indonesian Family Life Survey 5). *J Public Health* 2021; 8(1): 79.
<http://dx.doi.org/10.31602/ann.v8i1.3679>
 - [16] Joe W, Patel N, Alambusha R, Kulkarni B, Yadav K, Sethi V. Coverage of iron and folic acid supplementation in India: Progress under the Anemia Mukht Bharat strategy 2017-20. *Health Policy Plan* 2022; 37(5): 597-606.
<http://dx.doi.org/10.1093/heapol/czac015> PMID: 35257147
 - [17] Nadiyah D, Dewanti LP, Mulyani EY, Jus'at I. Nutritional anemia: Limitations and consequences of Indonesian intervention policy restricted to iron and folic acid. *Asia Pac J Clin Nutr* 2020; 29 (Suppl. 1): S55-73.
[http://dx.doi.org/10.6133/APJCN.202012_29\(S1\).06](http://dx.doi.org/10.6133/APJCN.202012_29(S1).06) PMID: 33377747
 - [18] Rustiawan A, Pratiwi A. Evaluation of the Program of Giving Iron Supplement Tablets to Pregnant Women at the Gedongtengen Health Center. *Abdi Geomedisains* 2022; 2(2): 61-71.
<http://dx.doi.org/10.23917/abdiGeomedisains.v2i2.313>
 - [19] Stanworth SJ, Churchill D, Sweity S, *et al*. The impact of different doses of oral iron supplementation during pregnancy: a pilot randomized trial. *Blood Adv* 2024; 8(21): 5683-94.
<http://dx.doi.org/10.1182/bloodadvances.2024013408> PMID: 39208353
 - [20] Augustine LF, Mullapudi V, Subramanian S, Kulkarni B. Infection-iron interaction during COVID-19 pandemic: Time to re-design iron supplementation programs. *Med Hypotheses* 2020; 143110173
<http://dx.doi.org/10.1016/j.mehy.2020.110173> PMID: 33017907
 - [21] Nasir BB, Fentie AM, Adisu MK. Adherence to iron and folic acid supplementation and prevalence of anemia among pregnant women attending antenatal care clinic at Tikur Anbessa Specialized Hospital, Ethiopia. *PLoS One* 2020; 15(5)e0232625
<http://dx.doi.org/10.1371/journal.pone.0232625> PMID: 32365114
 - [22] Nimwesiga C, Murezi M, Taremwa IM. Adherence to Iron and Folic Acid Supplementation and Its Associated Factors among Pregnant Women Attending Antenatal Care at Bwindi Community Hospital, Western Uganda. *Int J Reprod Med* 2021; 2021: 1-10.
<http://dx.doi.org/10.1155/2021/6632463> PMID: 34195259
 - [23] Kamau MW, Kimani ST, Mirie W, Mugoya IK. Effect of a community-based approach of iron and folic acid supplementation on compliance by pregnant women in Kiambu County, Kenya: A quasi-experimental study. *PLoS One* 2020; 15(1)e0227351
<http://dx.doi.org/10.1371/journal.pone.0227351> PMID: 31923240
 - [24] Agegnehu G, Atenafu A, Dagne H, Dagnaw B. Adherence to Iron and Folic Acid Supplement and Its Associated Factors among Antenatal Care Attendant Mothers in Lay Armachiho Health Centers, Northwest, Ethiopia, 2017. *Int J Reprod Med* 2019; 2019: 1-9.
<http://dx.doi.org/10.1155/2019/5863737> PMID: 31275954
 - [25] Asmamaw DB, Debebe Negash W, Bitew DA, Belachew TB. Poor adherence to iron-folic acid supplementation and associated factors among pregnant women who had at least four antenatal care in Ethiopia. A community-based cross-sectional study. *Front Nutr* 2022; 91023046
<http://dx.doi.org/10.3389/fnut.2022.1023046> PMID: 36570134
 - [26] Getachew M, Abay M, Zelalem H, Gebremedhin T, Grum T, Bayray A. Magnitude and factors associated with adherence to Iron-folic acid supplementation among pregnant women in Eritrean refugee camps, northern Ethiopia. *BMC Pregnancy Childbirth* 2018; 18(1): 83.
<http://dx.doi.org/10.1186/s12884-018-1716-2> PMID: 29621996
 - [27] Van Meter DS, Van Horn CE. The policy implementation process: a conceptual framework. *Adm Soc* 1975; 6(4): 445-88.
<http://dx.doi.org/10.1177/009539977500600404>
 - [28] Rohmatin HN, Mustikanigrum F. The Relationship Between Adherence to The Consumption of Blood Supplement Tablets with the Incidence of Anemia in Pregnant Women in The Working Area of The Krebet Health Center, Madiun District. *Int J Sci Soc* 2024; 6(2): 719-31.
<http://dx.doi.org/10.54783/ijssoc.v6i2.1198>
 - [29] Esem O. Nutritional Status and Compliance with Blood Supplemental Tablets as a Cause of Anemia in Pregnant Women. *EMBRIIO* 2023; 15(2): 150-8.
<http://dx.doi.org/10.36456/embrio.v15i2.7396>
 - [30] Sharief SA, Minhajat R, Riu DS, Bukhari A, Amir H. Normocytic Anemia in Pregnant Women: A Scoping Review. *Med J Malaysia* 2024; 79(5): 646-57.
PMID: 39352168

DISCLAIMER: The above article has been published, as is, ahead-of-print, to provide early visibility but is not the final version. Major publication processes like copyediting, proofing, typesetting and further review are still to be done and may lead to changes in the final published version, if it is eventually published. All legal disclaimers that apply to the final published article also apply to this ahead-of-print version.