Health Dynamics
eISSN: 3006-5518
Publisher: Knowledge Dynamics
DOI: https://doi.org/10.33846/hd30202

Review

Determinants of Iron Supplementation Adherence in Pregnancy and Their Implications for Maternal Health Outcomes: A Systematic Literature Review

Diza Ulya Nurfaizah[1], Jayanti Dian Eka Sari[1,2,*] and Endang Lestari[1]

[1]Public Health Study Program, Faculty of Health, Medicine, and Life Sciences, Universitas Airlangga, Banyuwangi, East Java 68425, Indonesia
[2]Research Group for health and well-being of Women & Children, Universitas Airlangga, Banyuwangi, East Java 68425, Indonesia

Article history
Received: 25 January 2026
Revised: 23 February 2026
Accepted: 26 February 2026
Published Online: 28 February 2026

***Correspondence:**
Jayanti Dian Eka Sari
Address: Public Health Study Program, Faculty of Health, Medicine, and Life Sciences, Universitas Airlangga, Banyuwangi, East Java 68425, Indonesia
Email: jayantidian@fkm.unair.ac.id

How to cite this article: Nurfaizah DU, Sari JDE, Lestari E. Determinants of Iron Supplementation Adherence in Pregnancy and Their Implications for Maternal Health Outcomes: A Systematic Literature Review. *Health Dynamics*, 2026, 3(2), 48-55. https://doi.org/10.33846/hd30202

ABSTRACT

Background: Maternal and infant mortality remain major global health challenges, particularly in developing countries. The World Health Organization (WHO) reported that in 2017, approximately 817 women died daily due to pregnancy-related causes, while UNICEF estimated 2.5 million infant deaths before one month of age in 2020. In Indonesia, the Maternal Mortality Rate (MMR) is still high and projected to reach 183 per 100,000 live births by 2024, which remains above the Sustainable Development Goals (SDGs) target. One of the main contributing factors to maternal mortality is anemia during pregnancy, which is prevalent in developing countries. **Methods:** This study used a systematic literature review approach based on the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. Articles were collected from PubMed and Web of Science databases using relevant keywords, with predetermined inclusion and exclusion criteria. **Results:** A total of 5 eligible articles were included in this review. The findings consistently showed that low compliance in consuming iron tablets among pregnant women was associated with a higher risk of anemia, which can increase the risk of maternal complications and mortality. **Conclusion:** Compliance in consuming iron tablets plays an important role in preventing anemia during pregnancy and reducing the risk of maternal mortality. Strengthening health education and monitoring of iron supplementation is essential to improve maternal health outcomes.

Keywords: Pregnant women; maternal death; iron tablets consumption

1. INTRODUCTION

Maternal and infant mortality is one of the health problems faced by all countries in the world. The measure of success of health interventions carried out by the government can be seen from the MMR and IMR rates. MMR is the number of maternal deaths due to complications of pregnancy, childbirth, and the postpartum period per 100,000 live births,[(1)] while IMR is the number of infant deaths aged 0 to 12 months per 1,000 live births.[(2)] The maternal mortality rate worldwide based on data from the World Health Organization (WHO) in 2017 is 817 deaths per day. Based on UNICEF data in 2020, the infant mortality rate (IMR) worldwide reached 2.5 million deaths before the age of one month.[(3)] Maternal and infant mortality mostly occur in developing countries.[(2)] The Maternal Mortality Rate (MMR) in Indonesia is still categorized as high for Southeast Asia.

In 2020, the Ministry of Health estimated that by 2024, the MMR in Indonesia would reach 183/100,000 live births and by 2030, it would be 131/100,000 live births, which is still far from the Sustainable Development Goals (SDGs) target.[4] The main factor causing maternal morbidity and mortality in developing countries is anemia.[5] The World Health Organization (WHO) states that the prevalence of anemia in pregnant women is 14% in developed countries and 51% in developing countries. Among several developing countries, India has the highest prevalence of anemia.[6] Several other factors causing maternal mortality are hemorrhage at 28%, eclampsia at 24%, and infection at 11%.[7]

Every day in 2017, approximately 810 women died from causes related to pregnancy and childbirth. Between 2000 and 2017, the maternal mortality rasio (MMR, number of maternal deaths per 100,000 live births) decreased by approximately 38% worldwide. 94% of all maternal deaths occurred in low- and lower-middle-income countries. The high maternal mortality rates in some regions of the world reflect inequities in access to quality health services and highlight the gap between the rich and the poor. The MMR in low-income countries in 2017 was 462 per 100,000 live births, while in high-income countries it was 11 per 100,000 live births. The main complications that cause nearly 75% of all maternal deaths are severe bleeding after childbirth, infection after childbirth, high blood pressure during pregnancy (pre-eclampsia and eclampsia), complications from unsafe delivery and abortion.[8]

Furthermore, the WHO states that most maternal deaths are preventable, as healthcare solutions to prevent or manage complications are widely known. All women need access to high-quality care during pregnancy, and during and after childbirth. It is crucial that all births are assisted by professional healthcare providers, as timely care and treatment can make the difference between life and death for both the mother and her baby. In the context of the Sustainable Development Goals (SDGs), countries have united behind a new target to accelerate the reduction of maternal mortality by 2030. SDG goal 3 includes the ambitious target of reducing global MMR to less than 70 per 100,000 births, with no country having a maternal mortality rate more than twice the global average.[8] High MMR can be prevented if pregnancy complications are detected early and receive appropriate and prompt medical assistance. The provision of quality antenatal care is estimated to reduce MMR by up to 20%.[9]

Therefore, this study aims to analyze factors associated with maternal health outcomes, particularly those related to preventable conditions such as anemia and access to quality antenatal care, as key determinants of maternal and infant mortality. Understanding these factors is essential to support the development of effective, evidence-based interventions to reduce MMR and IMR, especially in developing countries like Indonesia. The findings of this study are expected to contribute to strengthening maternal health programs, improving early detection of pregnancy complications, and supporting policy-making to achieve the Sustainable Development Goals (SDGs) targets related to maternal and child health.[10-12]

2. METHODS

2.1 Study Design

The research method used was a Systematic Literature Review (SLR), with data sources in the form of journals, articles, or research results in electronic databases published on the Web of Science and PubMed portals.

2.2 Data Source and Extraction

Inclusion criteria for the study included articles or journals that were relevant to the research topic, used Indonesian or English, were published in the last 5 years (2020-2025), and were accessible in full text. Articles or journals that are not accessible in full text will be excluded from the study. Sampling was conducted by the first author, then reviewed by the authors using the PRISMA diagram to select articles or journals that meet the inclusion criteria of the study. In addition, the selection process also took into account the research questions that had been set. If an article did not answer one of the research questions, the authors agreed to exclude it.

2.3 Search Strategy

The search strategy uses keywords on Web of Science ("iron supplementation" OR "iron folic acid") AND ("pregnant women" OR pregnancy) AND ("maternal mortality" OR "maternal death") and also using keywords on PubMed is ("Iron Supplements"[Mesh] OR "Iron, Dietary"[Mesh] OR "iron supplementation" OR "iron folic acid") AND ("Pregnant Women"[Mesh] OR "Pregnancy"[Mesh] OR pregnant women) AND ("Maternal Mortality"[Mesh] OR "maternal death" OR "maternal mortality risk").

2.4 Articles Selection

Search for articles and journals based on keywords found 128 in the range of years (2020 -2025). The author selected articles that met the criteria, resulting in 5 international articles that met the criteria and were read in full on Web of Science and PubMed. The following Figure 1 is the database search flow diagram used in this study in accordance with the PRISMA method.

3. RESULTS

After doing an article search in the database using keywords that has been determined. Then the researcher search for articles that match the criteria defined eligibility previously. There are 5 matching articles left and can be used as literature review in this study (Table 1).

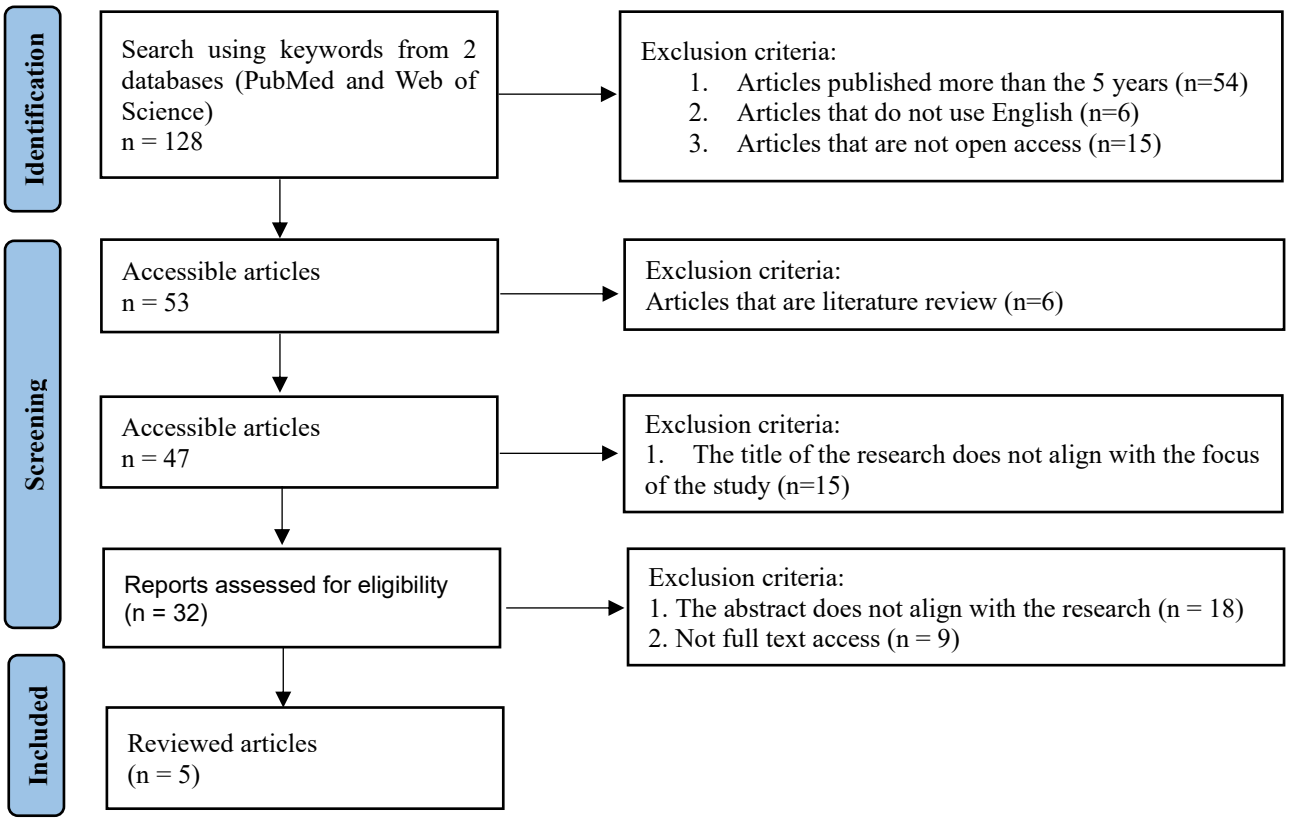

Figure 1. PRISMA flow diagram that used for literature selection

Table 1. Included studies and the review findings

Title	Author(s), year	Sample	Method	Result
Pooled prevalence and determinants of antenatal care visits in countries with high maternal mortality: A multi country analysis[13]	Dagmawi Chilot, Daniel Gashaneh Belay, Tigist Andargie Ferede, Kegnie Shitu, Melaku Hunie Asratie, Sintayehu Ambachew, Yadelew Yimer Shibabaw, Demiss Mulatu Geberu, Melkamu Deresse and Adugnaw Zeleke Alem (2023)	The study utilized national survey data with a sample size of pregnant women who met the inclusion criteria (women who received or consumed IFA tablets during pregnancy).	Using a cross-sectional study design to analyze compliance with iron and folic acid supplementation among pregnant women and the factors that influence it. Data were analyzed using bivariate and multivariate logistic regression approaches to identify determinants significantly associated with compliance, with a significance level of $p <$ 0.05.	The results of the study show that the level of compliance with iron-folic acid tablet consumption is still not optimal. Factors significantly associated with increased compliance include higher maternal education levels, adequate antenatal care (ANC) visits, access to health information, better economic status, and counseling from health workers. Conversely, low education, limited access to health services, and lack of exposure to health information are associated with low compliance.

(*continued on next page*)

Table 1. (*continued*)

Title	Author(s), year	Sample	Method	Result
Compliance level and factors associated with iron–folic acid supplementation among pregnant women in Dangila, Northern Ethiopia: A cross-sectional study[14]	Abiyot Wolie Asres, Woldeamilak Adamu Hunegnaw, Addisu Gasheneit Ferede, Tamene Wolie Azene (2022)	The research sample consisted of 589 pregnant women who had consumed iron-folic acid (IFA) tablets for at least 3 months, selected using multi-stage sampling techniques	Data were collected through structured questionnaires with direct interviews, then analyzed using Epi Info 7 and SPSS version 23 with bivariate and multivariable logistic regression tests at a significance level of $p < 0.05$.	The results showed a compliance rate of 76.9% with an average consumption of 5.3 tablets per week. Factors that increased compliance included distance to health facilities ≤30 minutes, having ≤4 children, attending ANC conferences, starting IFA in the first trimester, receiving ≤30 tablets per visit, and receiving counseling. Meanwhile, mothers who worked as government employees had lower compliance rates.
Spatial distribution and determinants of iron supplementation among pregnant women in Ethiopia: a spatial and multilevel analysis[15]	Chilot Desta Agegnehu, Getayeneh Antehunegn Tesema, Achamyeleh Birhanu Teshale, Adugnaw Zeleke Alem, Yigizie Yeshaw, Sewnet Adem Kebede, Alemneh Mekuriaw Liyew (2023)	A total weighted sample of 7589 women was included for analysis.	For spatial analysis, ArcGIS version 10.6 and SaTScan version 9.6 were used to examine geographical distribution and identify hotspots for iron supplementation in Ethiopia. To analyze determinants, researchers used multilevel logistic regression to identify factors at the individual and community levels associated with iron supplementation. Model fit and model comparison were assessed using Deviance, Median Odds Ratio (MOR), and Intra-class Correlation Coefficient (ICC). Variables with a p-value < 0.2 in bivariate analysis were included in multilevel multivariate analysis. In the final analysis, Adjusted Odds Ratio (AOR) with 95% Confidence Interval (CI) was used to determine significant factors.	The spatial distribution of iron supplementation was significantly varied across the country with Global Moran's index value of 0.3 ($p < 0.001$, RR=1.35). ANC visit (AOR =3.66, 95%CI: 3.21, 417), community education [AOR = 1.31, 95%CI, 1.07, 1.59), media exposure (AOR =1.33, 95%CI: 1.15, 1.53), distance to health facility (AOR = 1.32, 95%CI: 1.16, 1.50), region and household wealth index were statistically significant determinant factors of iron supplementation
The Incidence, Complications and Treatment of Iron Deficiency in Pregnancy[16]	Ashley E. Benson, MD, MA, MSc, Joseph J. Shatzel, MD, MCR, Kim S. Ryan, MD1, Madeline A. Hedges, Kylee Martens, MD, Joseph E. Aslan,	Phase III clinical trials involving 2,018 pregnant women with iron deficiency anemia. A large-scale cohort study involving more than 500,000	Review observational studies, randomized controlled trials, large-scale cohort studies, and meta-analyses.	The results of the study show that iron deficiency and iron deficiency anemia are very common conditions during pregnancy, with a global prevalence of 30–60%, increasing to around 75% in the third trimester. In terms of maternal health, iron deficiency is associated with an increased risk of premature delivery, cesarean section,

(*continued on next page*)

Table 1. (*continued*)

Title	Author(s), year	Sample	Method	Result
	PhD2, Jamie O. Lo, MD, MCR (2023)	infants and nearly 300,000 mothers to assess the relationship between prenatal anemia and neurological developmental disorders. Observational studies involving hundreds of pregnant women in evaluating the effectiveness of various intravenous iron formulations. A postpartum meta-analysis covering more than 2,000 postpartum mothers.		postpartum hemorrhage, blood transfusion requirements, intensive care, and an increased risk of maternal mortality. In addition, this condition is also associated with a decline in quality of life and an increased risk of postpartum depression. In fetuses and infants, maternal iron deficiency is associated with an increased risk of low birth weight, small for gestational age, neurological developmental disorders, and an increased risk of autism spectrum disorders if anemia occurs before 30 weeks of gestation. Iron deficiency can also affect neonatal iron stores and potentially have long-term effects on cognitive function. In terms of therapy, oral iron supplementation remains recommended as first-line therapy, despite often causing gastrointestinal side effects and having limited bioavailability. Meanwhile, intravenous iron preparations have been proven safe and effective in the second and third trimesters, with faster increases in hemoglobin and ferritin levels and better tolerability compared to oral therapy.
Knowledge and attitudes of pregnant women with adherence patterns to consuming iron tablets in East Aceh Regency[17]	Devi Utari and Agus Hendra Al Rahmad (2022).	The sample in this study consisted of 41 pregnant women in their third trimester who lived in the working area of the Community Health Center in East Aceh Regency. The sample was selected using purposive sampling technique.	This study uses a quantitative descriptive method with a cross-sectional approach, which is an approach that observes research variables at a certain point in time without any intervention from the researcher.	58.5% of pregnant women had good knowledge about anemia and iron supplementation. There was a significant association between knowledge level and adherence to iron supplementation (p = 0.035; OR = 4.4). There was a significant relationship between attitude and compliance with iron tablet consumption (p = 0.018; OR = 5.4). 68.3% of pregnant women showed a positive attitude towards the importance of iron tablet consumption. 70.7% of pregnant women complied with iron tablet consumption as recommended.

4. DISCUSSION

The synthesis of the reviewed studies demonstrates that adherence to iron–folic acid supplementation during pregnancy is shaped by an interaction between behavioral, structural, and biological determinants rather than being solely an individual nutritional issue. Across multi-country settings with high maternal mortality, inadequate antenatal care (ANC) utilization consistently correlates with lower supplementation coverage. This relationship occurs because ANC functions not only as a clinical monitoring platform but also as a behavioral reinforcement

mechanism. Repeated contact with healthcare providers enhances maternal knowledge, increases perceived susceptibility to anemia-related complications, and strengthens motivation to adhere to supplementation. When ANC attendance is limited, women receive fewer counseling sessions, reduced follow-up monitoring, and weaker reinforcement of preventive behaviors, which explains the downward trend in compliance observed in low-visit groups. The effect is amplified in rural and socioeconomically disadvantaged populations, where structural barriers such as transportation constraints, health facility shortages, and supply chain instability reduce access to supplements. Spatial analyses further confirm that iron supplementation adherence follows geographic clustering patterns, indicating that maternal anemia is partly a structurally embedded public health issue. Areas with weak health infrastructure tend to exhibit lower coverage, not because of individual unwillingness, but because systemic constraints limit consistent availability and supervision.

At the individual level, educational status and knowledge significantly influence adherence patterns. The positive trend between maternal education and compliance can be explained through cognitive-behavioral mechanisms: educated women are better able to process health information, evaluate risk severity, and understand the long-term implications of untreated anemia, such as postpartum hemorrhage and fetal growth restriction. In contrast, low health literacy diminishes perceived benefit and reduces sustained behavioral commitment. Additionally, pharmacological side effects particularly gastrointestinal discomfort caused by unabsorbed iron irritating the intestinal mucosa trigger avoidance behavior, which scientifically explains why some women discontinue supplementation despite understanding its benefits. This reflects a classic negative reinforcement process in health behavior theory. Therefore, adherence is the product of both cognitive appraisal and physiological experience. The consistency of these findings across Ethiopian and Indonesian contexts suggests that behavioral determinants operate similarly across cultural settings, although the magnitude of influence may vary depending on sociocultural norms and health system support.

From a biomedical perspective, the biological plausibility of these behavioral and structural findings is strong. During pregnancy, plasma volume expands by approximately 40–50%, increasing iron demand for erythropoiesis and fetal development. If supplementation is insufficient, hemoglobin synthesis declines, reducing oxygen-carrying capacity and leading to tissue hypoxia. Placental insufficiency, impaired fetal growth, preterm birth, and increased risk of postpartum hemorrhage are downstream consequences of this physiological pathway. Thus, inadequate adherence is not merely a behavioral deviation but a direct contributor to adverse obstetric outcomes through disrupted oxygen transport mechanisms. Clinical literature supports this mechanistic pathway, reinforcing that iron deficiency anemia significantly increases maternal morbidity risk. However, clinical studies often focus on therapeutic management (oral versus intravenous iron) without sufficiently addressing upstream social and structural determinants, while public health studies frequently quantify determinants without integrating detailed biological explanations. This fragmentation highlights a conceptual separation between epidemiological patterns and biomedical mechanisms.

Collectively, the reviewed studies align with the Social Determinants of Health framework, demonstrating that maternal anemia risk is produced through layered influences: individual cognition, household socioeconomic status, community infrastructure, geographic accessibility, and systemic health service performance. Nevertheless, important research gaps remain. Most available studies employ cross-sectional designs, limiting causal inference and longitudinal understanding of how adherence patterns evolve throughout pregnancy. There is also limited integration of multilevel spatial analysis with biological severity indicators such as hemoglobin concentration or clinical complication rates. Existing research tends to examine determinants, spatial clustering, or pathophysiology separately rather than constructing an integrated explanatory model linking structural inequities, behavioral adherence, physiological iron deficiency progression, and maternal morbidity or mortality outcomes. Furthermore, evidence from Indonesia remains predominantly small-scale and localized, lacking advanced multilevel or spatial modeling approaches that could capture broader systemic patterns.

Theoretically, these findings indicate the necessity of integrating biomedical anemia mechanisms with behavioral science and structural health system analysis into a unified framework. Practically, strengthening ANC must go beyond increasing visit frequency and instead enhance counseling quality, side-effect management, and follow-up continuity. Stabilizing iron supplement supply

chains and implementing geographically targeted interventions in high-risk clusters are essential strategies to reduce disparities. Addressing iron deficiency in pregnancy therefore requires a comprehensive approach that simultaneously targets biological needs, cognitive determinants, and structural inequities to effectively reduce maternal morbidity and mortality risk.

5. CONCLUSION

This systematic review demonstrates that adherence to iron folic acid supplementation during pregnancy is a biologically and structurally mediated determinant of maternal and neonatal outcomes in high maternal mortality settings. The evidence indicates that low compliance is consistently associated with inadequate antenatal care utilization, limited maternal education, socioeconomic deprivation, weak counseling quality, and geographic inequities in health service distribution. This pattern occurs because pregnancy physiologically increases iron requirements due to plasma volume expansion and fetal demands, while structural barriers such as limited health system contact, unstable supply chains, and poor health literacy constrain effective supplementation and dietary iron absorption. The persistence of iron deficiency despite universal supplementation policies reveals an implementation gap, where availability does not translate into effective utilization, particularly in spatially disadvantaged regions. These findings extend existing social determinants of health frameworks by integrating biomedical mechanisms with multilevel and spatial determinants, positioning maternal anemia as a multidimensional and system-dependent condition. Therefore, reducing maternal morbidity and mortality requires not only supplement provision but also strengthened ANC quality, targeted geographically responsive interventions, improved counseling strategies, and systemic health service reform to address both physiological vulnerability and structural inequity simultaneously.

Ethical Approval

Not required.

Acknowledgement

We would like to thank the Public Health Study Program of Airlangga University (Banyuwangi Campus) and the supervising lecturers who have provided guidance and support during this research process.

Competing Interests

All the authors declare that there are no conflicts of interest.

Funding Information

No funds were received for this study.

Underlying Data

Derived data supporting the findings of this study are available from the corresponding author on request.

REFERENCES

1. Nur MSK, Khiriyah HI, Kurniawan D. Pengembangan Model Pendidikan Kesehatan pada Ibu Hamil untuk Menurunkan Angka Kematian Ibu di Kabupaten Bogor. Jurnal Program Kreatifitas Mahasiswa. 2018;2(1):23-30. https://doi.org/10.32832/pkm-p.v2i1.198
2. Noftalina E. Upaya Peningkatan Pengetahuan Mengenai Tanda Bahaya Nifas dan bayi Baru lahir. Jurnal Inovasi & Terapan Pengabdian Masyarakat. 2021;1(1):1-5. https://doi.org/10.35721/jitpemas.v1i1.6
3. Husada P, Yuniasih AF. Analisis Spasial Angka Kematian Neonatal di Pulau Jawa Tahun 2020. Seminar Nasional Official Statistics.2022;2022(1):207–216. https://doi.org/10.34123/semnasoffstat.v2022i1.1273
4. Anisykurlillah R, Supit PWE. Evaluasi Pembangunan Kesehatan dalam Upaya Penurunan Angka Kematian Ibu dan Bayi di Kabupaten Malang. Journal Publicuho. 2023;6(1):257–266. https://doi.org/10.35817/publicuho.v6i1.116
5. Ministry of Health of Republic Indonesia. Profil Kesehatan 2015. Jakarta: Ministry of Health of Republic Indonesia; 2016.
6. Safitri S. Pendidikan Kesehatan tentang Anemia kepada Ibu Hamil. Jurnal Abdimas Kesehatan (JAK). 2020;2(2):94. https://doi.org/10.36565/jak.v2i2.88
7. Noftalina E. Upaya Peningkatan Pengetahuan Mengenai Tanda Bahaya Nifas dan bayi Baru lahir. Jurnal Inovasi & Terapan Pengabdian Masyarakat. 2021;1(1):1-5. https://doi.org/10.35721/jitpemas.v1i1.6
8. World Health Organization. Maternal Mortality. Geneva: World Health Organization; 2019.
9. World Health Organization. Trends in maternal mortality 2000 to 2020: estimates by WHO, UNICEF, UNFPA, World Bank Group and UNDESA. Geneva: World Health Organization; 2023.
10. Say L, Chou D, Gemmill A, Tunçalp Ö., Moller AB, Daniels J, Gülmezoglu AM, Temmerman M, Alkema L. Global causes of maternal death: a WHO systematic analysis. The Lancet Global Health. 2014;2(6):323–333. https://doi.org/10.1016/S2214-109X(14)70227-X

11. Carroli G, Villar J, Piaggio G, Khan-Neelofur D, Gülmezoglu M, Mugford M, Lumbiganon P, Farnot U, Bersgjord L. WHO systematic review of randomised controlled trials of routine antenatal care. The Lancet. 2001;357(9268):1565–1570. https://doi.org/10.1016/S0140-6736(00)04723-1
12. Suarayasa K. Strategi Menurunkan Angka Kematian Ibu (AKI) Di Indonesia. Yogyakarta: Deepublish; 2020.
13. Chilot D, Belay DG, Ferede TA, Shitu K, Asratie MH, Ambachew S, Shibabaw YY, Geberu DM, Deresse M, Alem AZ. Pooled prevalence and determinants of antenatal care visits in countries with high maternal mortality: A multi-country analysis. Frontiers in Public Health; 2023;11:1035759. https://doi.org/10.3389/fpubh.2023.1035759
14. Asres AW, Hunegnaw WA, Ferede AG, Azene TW. Compliance level and factors associated with iron–folic acid supplementation among pregnant women in Dangila, Northern Ethiopia: A cross-sectional study. SAGE Open Medicine. 2022;10:1-8. https://doi.org/10.1177/20503121221118989
15. Agegnehu CD, Tesema GA, Teshale AB, Alem AZ, Yeshaw Y, Kebede SA, Liyew AM. 'Spatial distribution and determinants of iron supplementation among pregnant women in Ethiopia: a spatial and multilevel analysis. Archives of Public Health. 2021;79(1):143. https://doi.org/10.1186/s13690-021-00669-2
16. Benson AE, Shatzel JJ, Ryan KS, Hedges MA, Martens K, Aslan JE, Lo JO. The incidence, complications, and treatment of iron deficiency in pregnancy. European Journal of Haematology. 2022;109(6):633–642. https://doi.org/10.1111/ejh.13870
17. Utari D, Al Rahmad AH. Pengetahuan dan sikap ibu hamil dengan pola kepatuhan mengonsumsi tablet tambah darah di Kabupaten Aceh Timur. Jurnal SAGO Gizi dan Kesehatan. 2022;4(1):8-13. https://doi.org/10.30867/gikes.v4i1.247