



FACTORS THAT INFLUENCE THE INCIDENT OF ANEMIA IN PREGNANT WOMEN: LITERATURE REVIEW

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ABSTRACT

Anemia is a condition where the volume of red blood cells in the peripheral circulation is below the normal range, thereby inhibiting adequate oxygen transport to the tissues and disrupting the body's normal physiological functions. This research aims to analyze the factors that influence the incidence of anemia. This research uses a systematic literature review method using a prism diagram. A total of 25,270 articles, 13,560 articles were excluded because they did not meet the inclusion criteria. The 330 eligible journals were then eliminated by 320 topic discrepancies and research discrepancies. The results of the study show that of the 10 articles that have been studied, the causes of anemia that occur in pregnant women include knowledge, maternal age, gestational age, compliance with consuming Fe tablets, nutritional status, culture and protein intake. Several factors cause anemia in pregnant women, one of which is knowledge, maternal age, gestational age, compliance with consuming Fe tablets, nutritional status, culture and protein intake.

Keywords: anemia; factors contributing to anemia; pregnant women

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INTRODUCTION

Anemia is still a health problem for society, especially pregnant women in various developing countries, including Indonesia. Anemia is a condition in which the volume of red blood cells in the peripheral circulation is below the normal range, thereby inhibiting adequate oxygen transport to tissues and disrupting the body's normal physiological functions. (Zhou, 2024) Lack of red blood cells in pregnant women is one of the health problems that is still often found in developing countries, including Indonesia. (Kemlenterilan Kesehatan RIL, 2023) Based on the latest data from WHO, it is stated that in 2025, the prevalence of anemia in pregnant women globally will reach around 35.5% (WHO, 2025) Based on the results of the 2023 Indonesian Health Survey (SKIL), the number of cases of red blood cell deficiency experienced by pregnant women in Indonesia reached 27.7%, which means that approximately 3 out of 10 pregnant women suffer from red blood cell deficiency. (Kemlenterilan Kesehatan RIL, 2023)

Based on the Health Profile of West Java Province, in West Java Province, the incidence of anemia in pregnant women shows the highest trend of 60,129 pregnant women with anemia (Dinas Kesehatan Provinsi Jawa Barat, 2024). Anemia in pregnancy can have a bad impact not only on the mother, but also on the fetus. Various serious complications can occur, such as premature labor, antepartum bleeding, infection, and heart failure. In babies, anemia can cause disruption of fetal growth in the womb, birth weight less than 2,500 grams, babies born prematurely, and even perinatal death. (Trilharini et al., 2025)

There are several factors related to anemia in women with pregnancy, one of which is nutritional status, while the age and parity of pregnant women are not related to the risk of

anemia in women with pregnancy, so there is a need for preconception preparation and regular prenatal checks from the beginning of pregnancy so that the prevalence of anemia in pregnant women can be managed by early detection of risk factors in pregnant women such as CED (Chronic Energy Deficiency). (Khasanah & Sulistyoningtyas, 2026) This research aims to analyze the factors that influence the incidence of anemia.

METHOD

This research uses a systematic literature review method. Researchers collect, organize, describe and conclude in a systematic and structured manner the aim of a systematic review. Researchers collected various literature according to the title through searches from various sources on the internet. The sources were searched using Indonesian from Google Scholar and BMLC Public Health, then using PRISMA (Preferred Reporting Item for Systematic) guidelines in selecting articles that were appropriate and suitable for analysis. The study examined in this article the incidence of anemia in pregnant women. Determination of inclusion criteria and exclusion criteria is carried out to make it easier for researchers to find articles that are similar to the article title. The inclusion criteria are articles published in the last 5 years from 2021 to 2026 so as to obtain information that is relevant to current research. In addition, the incidence of anemia in pregnant women as a criterion in searching for articles. Cross sectional method with a quantitative design, while those included in the exclusion criteria are articles that do not meet the inclusion criteria and are declared unfit after being searched. Based on the PRISMA diagram, 25,270 articles were obtained from Google Scholar and BMLC Public Health. Following the removal of duplicates and the screening of titles and abstracts, an eligibility assessment of the full-text articles was conducted. A total of 10 articles met the inclusion criteria and were used in the literature review analysis. This process aimed to ensure that the selected articles were relevant to the research topic. The following is a PRISMA flow diagram in searching for scientific articles for this research

RESULT

As for the results traced from several literatures using a prism diagram, after selecting and filtering various literatures, the researcher selected 10 articles that were relevant to the researcher's title from a total of 19,600 articles, while 10,200 articles did not meet the inclusion criteria and several were paid access articles. Review of various literature through filtering as in the prism diagram below:

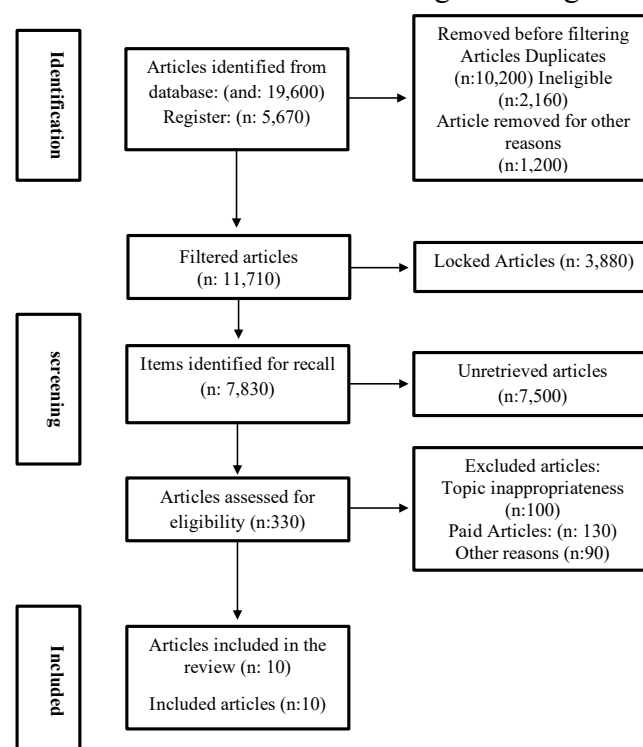


Table 1.
Results of the Systematic Literature Review

No	Author, Year	Title	Sample	Research Design	Results
1	Angelila Friliska Tendean, Cherol Nelson Eriing, Sancail MLakasudede. 2025 (Tendean et al., 2025)	Relatilonship between Pregnant MLOther's Age, Gestatlonal Age, and Complilance wllth Fe Tablet Consumlptlon wllth the ILncldence of Anemlila ln Pregnant Womlen	Thls research lnvolved 81 pregnant womlen who were selected uslng a purposlve sampllng technlque	Thls research uses an analytlcal observatlonal deslgn approach case control study	Research results showed a slgnlflcant relatilonship between the age of pregnant womlen and the lnclldence of anemlila ($p = 0.004$), age pregnancy wllth the lnclldence of anemlila ($p = 0.001$), and the level of compllance wllth consumlng Fe tablets wllth the lnclldence of anemlila ($p = 0.019$)
2	Satrlanll, Vonny Khresna Dewll, MLegawatll, Rubllatll Hllpnll, 2025 (Satrlanll et al., 2025)	The relatilonship between knowledge and culture and the lnclldence of anemlila ln Pregnant Womlen ln the MLantewe Commlunlty Health Center Worklng Area Tanah Bumblu Regency ln 2024	The populatlon ln thls study was 70 pregnant womlen. The sample ln the study was 73 pregnant womlen. The sampllng technlque used ls Sllmple Randoml Sampllng	Thls study ls an observatlonal analytlc study wllth a cross-sectlonal approach.	The lnclldence of anemlila ln pregnant womlen was 31 mlothers (42.5%), mlothers who had sufflcilent knowledge were 27 (37.0%), mlothers who dld not have a conflctlng culture were 36 mlothers (49.3%). There ls a relatilonship between knowledge and the lnclldence of anemlila ($p.value = 0.018 < \alpha 0.05$) and there ls a relatilonship between culture and the lnclldence of anemlila ($p.value = 0.046 < \alpha 0.05$)
3	Dessy Setyo Susantll, Vonny Kresna Dewll, Ernll Yulllastutll, ILsnanllah, 2025 (Susantll et al., 2025)	Relatilonship between age and parllty wllth the lnclldence of anemlila ln pregnant womlen Darul Azhar Commlunlty Health Center Worklng Area ln 2023	Populatlon ln thls study there were 252 respondent s. The sample for thls study was 72 pregnant womlen respondent s	quantltatlve deslgn wllth a cross-sectlonal approach	The study results demlonstrate a slgnlflcant relatilonship between age and parllty and the lnclldence of anemlila amlong pregnant womlen at the Darul Azhar Commlunlty Health Center ln 2023. Unllvarlate analysls of the 72 respondents revealed that the mlajorlty (45 lncllvlduals or 62.5%) suffered froml anemlila; 32 lncllvlduals (44.4%) fell lnlo the hlgh-rlsk age category, and 38 lncllvlduals (52.8%) fell lnlo the hlgh-rlsk parllty category. Bllvarlate analysls uslng the chl-square test yllilded p-values of 0.000 for age and 0.003 for parllty.
4	Nur Aprlllyantll, Sllska Pratlwl, Clltra Dewll Anggrallnll, 2025	Relatilonship between proteln lnltake and the lnclldence of anemlila ln pregnant womlen	The sample conslsted of 45 pregnant womlen selected vlal	The research deslgn used ls cross-sectlonal	The results showed that there was a slgnlflcant relatilonship between proteln lnltake and the lnclldence of anemlila ($p = 0.031$). MLOthers wllth lnlsufflcilent proteln lnltake have a hlgher rlsk of developlng anemlila than mlothers wllth sufflcilent proteln lnltake

No	Author, Year	Title	Sample	Research Design	Results
	(Aprilyantil et al., 2025)	Posyandu Bakau Serilp and Sakura ILndah Samlbau Commlunilty Health Center, Bataml Cilty	purposilve samplpiling		
5	Salsabilla, Satrila Safilrza, Shella Wildya Ganil, 2025 (Salsabilla et al., 2025)	The Relatilonshilp Between Pregnant Womlen's Knowledge and the ILncildence of Anemlila Durilng Pregnancy at the Kopelmla Darussalaml Commlunilty Health Center, Banda Aceh Cilty	ILnvolviln g 79 pregnant womlen as respondent s	Thils study employs an analytilcal observatilonal desilgn wilth a cross-sectilonal approach	The analysils results ilndilcate a silgnilfilcant relatilonshilp between the level of knowledge and the ilncildence of anemlila (p-value < 0.01). A total of 41 respondents (51.9%) possessed good knowledge, and the mlajorilty (52 ilndilvilduals or 65.8%) dild not have anemlila. Amlong pregnant womlen aged over 35, four (57.1%) had good knowledge, whille all mlothers wilth a mlaster's degree (S2) possessed good knowledge (3 ilndilvilduals, 100%). The mlajorilty of workilng mlothers also had good knowledge (18 ilndilvilduals, 69.2%). The mlost commlnly cilted source of ilnformlatilon was health books (2 ilndilvilduals, 100%).
6	Kadek Rahayu Cahyanil, IL Komlang Agusjaya MLataraml, IL.A. Eka Padmlilaril, 2025 (Cahyanil et al., 2025)	The Relatilonshilp Between Knowledge and ILntake Levels of ILron, Folile Acild, Viltamliln C, Proteiln, and Energy and the ILncildence of Anemlila Amlong Pregnant Womlen at Serilrilt 1 Commlunilty Health Center, Buleleng Regency	The research sample consilsted of 50 people selected froml 98 pregnant womlen iln the work area of Serilrilt IL Health Center, Buleleng Regency	Thils type of research ils observatilonal wilth a cross-sectilonal desilgn carried out iln Decemlber 2023	The results of statilstilcal tests showed that there was no relatilonshilp between the level of consumpltilon of ilron (p 0.296; r 0.151), folile acild (p 0.184; r 0.191), viltamliln C (p 0.488; r 0.101), proteiln (p= 0.849; r 0.028), and energy (p 0.527; r 0.092) and knowledge of pregnant womlen. There ils a relatilonshilp between the level of consumpltilon of ilron (p 0.001; r 0.744), folile acild (p 0.001; r 0.660), viltamliln C (p 0.001; r 0.697), proteiln (p 0.001; r 0.491), and energy (p 0.001; r 0.678) wilth anemlila status iln the workilng area of Serilrilt 1 Commlunilty Health Center, Regency Buleleng
7	Frilza Novilta Saril Siltumlorang, Evo MLalilnil Sillalahil, Damlayantil Sonila Novilta Saril, Rilsmlalila Tarilgan, 2025 (Novilta et al., 2025)	The Relatilonshilp Between Age and Parilty and the ILncildence of Anemlila Amlong Pregnant Womlen at the Lilnda Elilsabet ILndependent MLildwilfery Practilce, Bejil Dilstrilct, Depok Cilty,	The study ilnvolved a total populatilon and sample of 76 pregnant womlen, wilth a 1:1 ratilo, comlprilsil ng 76 pregnant womlen iln	Thils study employs a case-control desilgn.	The mlajorilty of respondents aged >20 years and >35 years dild not experilence anemlila as mlany as 20 people (52.6%), respondents who had hilgh parilty status and experilenced anemlila were 18 people (47.4%). There ils a silgnilfilcant relatilonshilp between the age and pair of pregnant womlen and the ilncildence of anemlila iln BPML Lilnda Elilsabet, Bejil Dilstrilct, Depok Cilty, West Java Provilnce wilth a p value <0.05 (0.001)

No	Author, Year	Title	Sample	Research Design	Results
		West Java Province, 2024	the case group and 76 pregnant women in the control group		
8	ILsrojenoveta Retsanboy, Elilsabet Bre Bolil, Dilyah Astutil Nurfa'ilzah, Oktlilana Pasangka, 2025 (Retsanboy et al., 2025)	The Relationship Between Nutritional Status and the Incidence of Anemia Along Pregnant Women at Abepura Community Health Center	a sample size of 258	The research employed a descriptive-correlational design with a cross-sectional approach, conducted at the Abepura Community Health Center.	Based on the results of the chi-square test, a p-value of 0.041 <0.05 was obtained, so there is a significant relationship between nutritional status and anemia in pregnant women at the Abepura Community Health Center. Odds ratio (OR) 1.672 with a confidence range of 95% (CI 1.020–2.742) shows that nutritional deficiencies during pregnancy have a 1.672 times risk of anemia compared to pregnant women who have good nutritional conditions.
9	Rilcha Agusmlarinda, Yustina Ananti, ILndah Purnamlasari, 2025 (Agusmlarinda et al., 2025)	Relationship between Chronic Energy Deficiency (CED) and Anemia in Pregnant Women	Purposive sampling was employed as the sampling technique, with a total of 67 pregnant women as respondents.	The quantitative study employs a cross-sectional approach.	The analysis stated that 20 respondents (29.8%) experienced anemia and CED, while 31 respondents (46.3%) did not experience anemia or CED. The Chi Square test produces a p-value of 0.000 ($p < 0.05$) and an Odds Ratio (OR) value of 0.000 (< 0.05), proving a significant relationship between CED and anemia. Confidence Interval (CI) of 9.841 (3.159–30.663) supports the existence of a significant relationship between CED and anemia in pregnant women.
10	Jasmilatil, Nurmlilla, Elilzar, Nova Sumlailni Prilhatin, 2025 (Jasmilatil et al., 2025)	The Relationship Between Maternal Knowledge and the Incidence of Anemia During Pregnancy	The sample size was 60 pregnant women in the first trimester Banda Sakti Health Center	This study is an analytical study using a cross-sectional design	The research results showed that 70% of respondents had an insufficient level of knowledge, and the proportion of pregnant women who experienced anemia reached 48.3%. Statistical tests show that there is a significant relationship between the level of knowledge and the incidence of anemia, with a p-value of 0.003

DISCUSSION

Definition of anemia

Anemia is a condition when the hemoglobin level in the blood is below the normal limit. This situation can occur due to insufficient nutrients that play a role in the process of forming blood cells, such as a deficiency of iron, folic acid, or vitamin B12. (Aminah et al., 2024). Anemia is a condition where the number of red blood cells or oxygen-carrying capacity (hemoglobin) is insufficient to meet the body's physiological needs. Anemia is a public health nutritional problem, especially in pregnant women where hemoglobin levels are less than 11.0 g/dl for the first and third trimesters and less than 10.5 g/dl for the second trimester. The prevalence rate of anemia is still high.

Factors influencing anemia

Based on the results of studies conducted on 10 journals, it was found that one of the factors influencing anemia is knowledge, which is one of the factors in the formation of health behavior. If pregnant women know and understand the consequences of anemia and how to prevent anemia, they will have good health behavior so that they can hopefully avoid various consequences or risks of anemia during pregnancy. (Septiyaningsih & Yunadi, 2021). Based on research conducted by Jasmiati et al (2025), it shows that there is a relationship between knowledge and the incidence of anemia in pregnant women at the Banda Sakti Health Center. Most mothers who experience anemia have insufficient knowledge about anemia in pregnancy. This is due to the lack of mothers receiving educational information about anemia in pregnancy. (Jasmiati et al., 2025)

The results of other research suggest that the knowledge of pregnant women is influenced by educational factors, most of whom only have secondary education (SMP-SMA) so that the information they get about anemia is still lacking or even just getting to know it and not many people apply methods to prevent anemia. Pregnant women with a high level of knowledge about anemia are more aware of the causes of anemia, as well as prevention strategies. On the other hand, pregnant women with a low level of knowledge about anemia have a less than optimal influence on the health behavior of pregnant women to prevent anemia, such as not consuming foods that contain iron. (Satriani et al., 2025)

Apart from knowledge of the age of pregnant women, it is also one of the factors that can influence anemia in pregnant women, as stated by Angelia Friska Tendean et al (2025) showing that the age of pregnant women shows a significant value of $0.041 < 0.05$, meaning that there is a significant relationship between the age of pregnant women and the incidence of anemia. Iron deficiency is very influential during pregnancy because iron is needed in larger portions to be supplied to the growing fetus and placenta and also to increase the mass of the mother's red blood cells. Conditions that require a lot of iron affect the age of the pregnant mother, very young or very old women are dangerous for pregnancy and are susceptible to anemia. Age < 20 is considered very young to get pregnant because at this age the female body usually still needs a lot of iron for its own growth, while age > 35 is considered very old because at this age it has entered the initial degenerative phase, so that the body's functions develop not optimally and will experience various health problems, apart from that the influence of decreased immunity is a factor that causes anemia in older pregnant women. Pregnancy at the age of < 20 or > 35 years is an age that is very susceptible to anemia. (Tendean et al., 2025)

At the age of > 20 years, a woman's body condition is not yet ready to accept pregnancy because it is still growing, therefore pregnant women still need nutrients for their growth and nutrition for the pregnancy itself is reduced, making it susceptible to anemia. The age of pregnant women > 35 years is also associated with deterioration and decreased body resistance and the condition of pregnant women's biological organs decreases which makes hemoglobin production decrease, making them susceptible to anemia. (Novita et al., 2025)

Another factor is gestational age, Angelia Friska Tendean et al (2025) stated that the results of statistical tests show that gestational age has a significant value of $0.021 < 0.05$, meaning that there is a significant influence of gestational age on the incidence of anemia. Pregnancy anemia is a body condition with hemoglobin levels $< 11\text{g\%}$ in the 1st and 3rd trimesters or Hb levels $< 10.5\%$ in the 2nd trimester. The need for iron in pregnant women during the first trimester is around 0.8 mg/day and will continue to increase to 7.5 mg/day in the final period of pregnancy. Needs that are not balanced with adequate intake will result in anemia in the third trimester. Things such as morning sickness and loss of appetite and hemodilution are things that can cause anemia in the first trimester. (Tendean et al., 2025)

CONCLUSION

The incidence of anemia in pregnancy is still considered high in Indonesia, the incidence of anemia in pregnant women can be called Potential Danger To Mother and Children. For this reason, anemia requires serious attention from all parties involved in health services.

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