

Review Article: Systematic Review, Meta-Analysis, Integrative Review, Scoping Review

HUSBAND SUPPORT IN PREGNANT WOMEN WHO TAKE FOLAMIL SUPPLEMENTS FOR INCREASING HEMOGLOBIN LEVELS: A LITERATURE REVIEW

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Abstract

Background: Folic acid deficiency in pregnancy will cause impaired maturation of erythrocyte nuclei, resulting in the appearance of red blood cells with abnormal shapes and sizes referred to as megaloblastic anemia, further impaired folic acid metabolism will cause impaired DNA replication and cell division processes, and this will affect the work of all cells of the body, including in iron metabolism.

Objectives: This study aims to determine the effect of husband support on pregnant women who consume phthalate supplements for increased hemoglobin levels.

Design: This research design is a systematic review to find and review articles from databases and theories that are descriptive.

Data Sources: Search for articles using the old version of the Mendeley application by entering the keyword "folic acid in pregnant women with inclusion criteria, namely the year of publication 2017-2021, English, full text and open access. There were 11 articles that were willing to be reviewed based on the inclusion criteria.

Review Methods: Systematic review method by filtering on the Mendeley website based on inclusion criteria, then collected and made a summary of the journal including the name of the researcher, year of publication of the journal, research title, method, and summary of results or findings. Summary of research journals are entered in table 1.

Results: From the search for articles, 4,463 articles were found. After filtering 9 eligible articles based on inclusion criteria, it was found that the level of folic acid consumption for pregnant women was still very low. Husband's support from the family can encourage pregnant women to be more enthusiastic in dealing with the changes that occur during pregnancy, including maintaining a healthy pregnancy through increased pregnancy visits and consumption of folic acid supplements. Pregnant women who receive attention and support from their husbands and families are more likely to accept and follow the advice given by health workers compared to pregnant women who receive less attention and support from their husbands and families.

Conclusion: Husband support in pregnant women who take Folamil supplements for the improvement of Haemoglobin is an important factor and has a very large influence on the health of pregnant women, so cooperation is needed between health workers and the family, especially the husband, in order to improve the health status of pregnant women.

Keywords: *Husband Support, Pregnancy, Folamil Supplements, Hemoglobin.*

INTRODUCTION

Anemia in pregnancy is a risk factor that causes maternal and infant morbidity and is still a global health problem, affecting nearly 50% of pregnant women (Black et al., 2013; Brabin et al., 2001; Haider & Bhutta, 2017; Keats et al., 2019; Means, 2020; Stephen et al., 2018).

The World Health Organization (WHO) reports about 32.4 million pregnant women suffer from anemia worldwide, with the highest prevalence in Africa (44.6%), followed by Asia with a majority of 39.3% (World Health Organization, 2015). About 20% of maternal deaths are caused by anemia, and most occur in developing countries (Black et al., 2013; Kefiyalew et al., 2014; Osman et al., 2020; Stephen et al., 2018).

Riskesdas results (2013) reported an incidence of anemia in pregnant women in Indonesia by 37.1% (Badan Penelitian dan Pengembangan Kesehatan, 2013) and an increase of 48.9% in 2018 (RISKESDAS, 2018).

The cause of anemia is mainly a lack of nutrients that play a role in forming hemoglobin, namely protein, iron, vitamin B12, vitamin C, and folic acid. Vitamin B12 is needed to activate folic acid and cell metabolism, especially gastrointestinal cells, bone marrow, and nerve tissue. Folic acid plays a role in the metabolism of amino acids necessary in the formation of red blood cells (Putri et al., 2020; Septiyeni et al., 2016). That's why pregnant women who experience a folic acid deficiency generally also experience anemia with all the consequences (look pale and easily tired, lethargic, and limp). It is also at risk of preterm labor, premature discharge of the placenta (solusio placentae), and miscarriage. (Scholl & Johnson, 2000).

Folic acid deficiency in pregnancy can cause impaired maturation of the erythrocyte

nucleus, so red blood cells with abnormal size forms are referred to as megaloblastic anemia; further disruption of folic acid metabolism will cause impaired DNA replication and cell division processes, this will affect the work of all body cells, including in iron metabolism. So we find the fact that folate deficiency and iron deficiency are simultaneous.

Like other nutrients, the adequacy of folic acid, which is a derivative of this B vitamin, can also be obtained from various daily foods. Green vegetables, such as broccoli, spinach, and asparagus, are rich in folic acid, with red or orange fruits such as watermelon, orange, banana, pineapple, also kiwi. Folic acid is also found in meat, beef, liver, fish, and milk (currently, many kinds of milk are fortified folic acid) (Nisa & Handayani, 2019; Rimawati et al., 2018).

One thing to note is how to process and cook foods rich in folic acid. If cooked for too long, the folic acid content can be reduced or even lost. Given these risks, pregnant women need to take folic acid supplements regularly according to the recommendations given, which pregnant women needed, namely 0.4-0.8 mg per day (Bibbins-Domingo et al., 2017; Jin, 2017). In 1991, the CDC (*Center for Disease Control*) recommended 4 mg of folic acid that should be consumed per day for mothers with a history of neural tube *defects* in the first pregnancy.

In pregnant women with a BMI (*body mass index*) > 35 who have a higher risk of disease, it takes a higher dose of folic acid, which is about 5 mg, and also the same dose is given to pregnant women with a history of low levels of adjustment to a drug, alcohol consumption, and tobacco. For pregnant women with a history of epilepsy or diabetes, folic acid is needed at a dose of 4-5 mg/day. Supplementation with folic acid may also reduce the risk in infants such as

labiopalato schisis, labioshisis, congenital heart defects, limb defects, and urinary tract anomalies.

Compliance of pregnant women in taking family supplements in accordance with the advice of health workers needs the support and assistance of the husband or family. A form of husband support for maternal obedience can be knowing and watching the mother when taking folamil supplements.

The husband is the most important person for a pregnant woman. Much evidence suggests that women who are noticed and loved by their partners during pregnancy will show fewer emotional and physical symptoms, easier self-adjustment during pregnancy, and less risk of labor complications.

METHODS

Design

The design of this research is Literature Review or literature review. The literature review is research that examines or critically reviews knowledge, ideas, or findings contained in the body of *academic-oriented literature* and formulates its theoretical and methodological contributions to a particular topic (Cahyono et al., 2019).

Search Methods

Searches for scientific articles using Mendeley application by including the keywords "*folic acid in pregnant women*" in the 2017-2021 publication year and evaluated based on:

1. Inclusion Criteria
 - a. Article discussing folic acid supplements in pregnant women;
 - b. Year of publication 2017-2021;
 - c. International Publications;
 - d. Articles using English; and
 - e. Original articles, full text, and open access.
2. Exclusion Criteria
 - a. Articles other than English.

Search Outcome

The search received 4,463 articles. After filtering the year of publication, namely 2017-2021, 1,297 articles were obtained. Furthermore, filtering duplication of articles, abstracts, not willing with the title, open-access type of research obtained 70 articles.

Then the final process is to read and choose articles that are eligible based on the criteria obtained 9 articles that are willing. Article Search Strategy can be seen in figure 1

Quality Appraisal

This literature review is synthesized using narrative methods by grouping similar extraction data according to the results measured to answer the purpose. Research journals that fit the inclusion criteria are then collected and made journal summaries, including the name of the researcher, the year of publication of the journal, the title of the study, methods, and summary of results or findings.

The summary of the research journal is entered into the table in accordance with the format mentioned above. To further clarify abstract analysis and full text, the journal is read and observed. The journal summary has then conducted an analysis of the content contained in the purpose of the research and the results/findings of the study.

Analysis of the journal's contents, then coded into the journal reviewed based on the outline or core of the study, is done by parsing in a sentence then if it has been collected then searched for similarities and differences in each study then discussed to conclude.

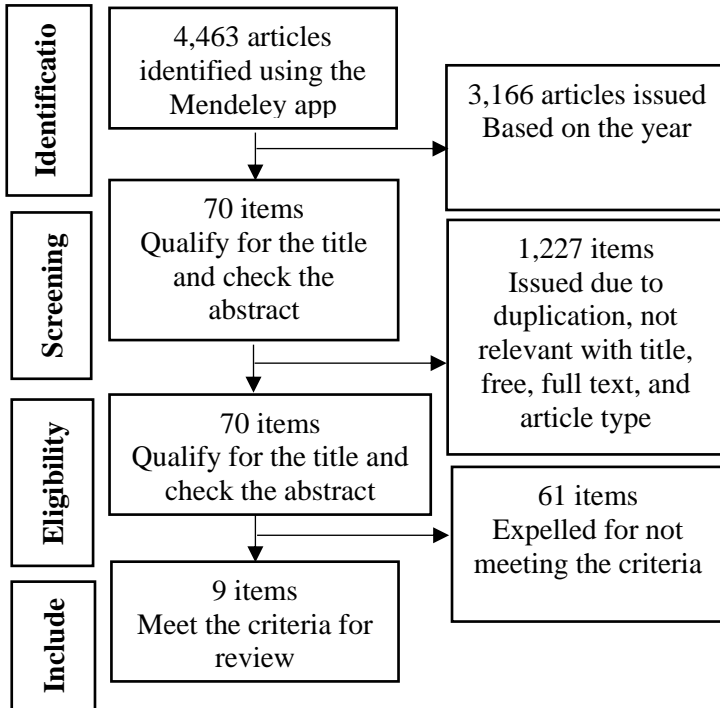


Figure 1. Article Search Strategy.

Data Abstraction

Researchers accompanied by two supervisors simultaneously review and read the full article, then discuss to agree on the decision

Table 1. Extraction of Research Results.

Author/ Year	Title	Type of Research and Sample	Data Analysis	Result
Habtmu Assefa, Solomon Mekonnen Abebe & Mekonnen Sisay (2019)	Magnitude and factors associated with adherence to iron and folic acid supplementation among pregnant women in Aykel town, Northwest Ethiopia (Assefa et al., 2019)	Cross-sectional Study. Systematic random sampling techniques were used to select 418 research subjects.	Bivariate and multivariate logistic regression analysis	The level of adherence to Iron and Folic Acid supplementation is low in the city of Aykel. Therefore, the strengthening and promotion of health education must be improved.
Zemenu Yohannes Kassa, Tegibelu Awraris, Alemneh Kabeta Daba & Zelalem Tenaw (2019)	Compliance with iron-folic acid and associated factors among pregnant women through pill count in Hawassa city, South Ethiopia: a community based cross-sectional study (Kassa et al., 2019)	Cross-sectional study. 422 research subjects were selected using simple random sampling techniques.	Bivariate and multivariate analysis	The fulfillment of folic acid iron in pregnant women is still low. Women who know the importance of iron-folic acid, women who experienced complications during previous

of the article that is adjusted to the criteria of inclusion.

Data Analysis/ Synthesis

Eleven articles were selected based on inclusion criteria that discuss the influence of husband support on pregnant women who consume phthalate supplements for increased hemoglobin levels.

RESULTS

Of the article searches using the Mendeley app, only 9 articles meet the criteria.

Figure 1. shows the smoothing of article selection from the database. Additional information, including author's name, year of publication, research design, sample, and data analysis, can be seen in table 1.

					pregnancies are independent predictors of iron-folic acid adherence.
Mekdemariam Getachew, Mebrahtu Abay, Hiwet Zelalem, Tirhas Gebremedhin, Teklit Grum & Alemayehu Bayray (2018)	Magnitude and factors associated with adherence to Iron-folic acid supplementation among pregnant women in Eritrean refugee camps, northern Ethiopia (Getachew et al., 2018)	Cross-sectional study. 320 pregnant women.	Bivariate and multivariate logistic regression		The compliance rate of folic acid supplementation is relatively low. Promotion of Iron Folic Acid, the benefits of early ANC visits on the prevention of anemia, and health benefits about the importance of iron-folic acid supplements are recommended to improve adherence.
Kendra Siekmans, Marion Roche, Jacqueline K. Kung'u, Rachelle E. Desrochers, Luz Maria De-Regil (2018)	Barriers and enablers for iron-folic acid (IFA) supplementation in pregnant women (Siekmans et al., 2018)	Qualitative study. Summarizing barriers and supporting factors for increased coverage and utilization of iron and folic acid supplements by pregnant women in 7 countries in Africa and Asia.	Mixed methods, targeted group discussions, and Interviews		Improved access and quality of ANCs are necessary to facilitate folic acid supplementation during pregnancy. Community-based delivery and counseling can address the issue of timely and ongoing access.
Lubna J Abdulmalek (2017)	Knowledge, Attitude and Practice Regarding Folic Acid among Pregnant Women in Benghazi, Libya. (Abdulmalek, 2017)	A cross-sectional study. 131 pregnant women.	Interview		Overall knowledge of folic acid periconceptional use is relatively low when compared to studies around the world.
Jihyun Kim, Miyong Yon, Cho-il Kim, Yoonna Lee, Gui-Im Moon, Jinhwan Hong and Taisun Hyun (2017)	Preconceptional use of folic acid and knowledge about folic acid among low-income pregnant women in Korea. (Kim et al., 2017)	Survey. 439 persons, a multilevel cluster probability sampling design.	Multivariate logistic regression		Public health strategies are needed to increase the use of folic acid prior to conception among Korean women.
Wondwossen Niguse (2019)	The adherence rate to iron-folic acid supplementation among pregnant	Cross-sectional quantitative studies. Sample 317 respondents selected	Univariate analysis		Compliance with iron/folic acid supplementation found in this study

	Women (Niguse, 2019)	by random method.	systematic sampling		was very low. The causes are maternal education, availability of supplements in health facilities, antenatal K1 visits, and health education about supplementation for a long time.
Winfrida B. Lyoba, Joyce D. Mwakatoga, Charles Festo, Jackline Mrema, and Ester Elisaria (2020)	Adherence to Iron-Folic Acid Supplementation and Associated Factors among Pregnant Women in Kasulu Communities in North-Western Tanzania (Lyoba et al., 2020)	Cross-sectional survey. Sample of 320 women.		Logistic linear regression	Adherence to iron-folic acid supplementation during pregnancy is low. Strengthening the system to create reminder systems, increase public awareness through educational programs to pregnant women and health facilities can improve adherence to folic acid supplements.
Yael Yagur MD, Saja Anaboussi MD, Mordechai Hallak MD and Alon Shrim MD (2017)	Factors Associated with Compliance of Folic Acid Consumption among Pregnant Women (Yagur et al., 2017)	Cross-sectional observational study. 382 women who participated in the study		Multivariate analysis	Education levels, pregnancy planning, and parity are associated with high folic acid consumption. Women who don't take folic acid do a little checking during pregnancy.

DISCUSSION

The literature review aims to find out the effect of husband support on pregnant women in taking Folic acid supplements for the increase of Haemoglobin. Of the 11 articles that egilabel based on inclusion criteria found that folic acid consumption for pregnant women is still very low. Although folic acid supplementation is recommended as part of antenatal visits to reduce the risk of low birth weight, maternal anemia, and iron deficiency, pregnant women's compliance rates are still low due to poor knowledge, living in rural areas,

poor antenatal re-visits (ANCs), and low levels of education (Mekonnen et al., 2021; Molla et al., 2019; Rai et al., 2016).

Non-compliance in taking iron-folic acid supplements during pregnancy has a negative impact on the mother and fetus. With increased adherence to folic acid consumption, the risk of anemia in the mother and newborn hemorrhagic disease and congenital anomalies in the fetus may decrease (Sendeku et al., 2020). Low intake of iron-folic acid during pregnancy is associated with an increased risk of childbirth that can be detrimental to both mother and

baby, such as neural tube defects, heart defects, and endocrine disorders. Iron folic acid supplementation is currently recommended to prevent adverse labor and hematological complications during pregnancy (Lumley et al., 2011).

Some findings in Southeast Asia, Latin America, and some African countries show that the factors that cause low adherence to folic acid supplements in pregnant women are intolerance of gastrointestinal side effects that can occur with iron consumption, limited supply of tablets, counseling that is still lacking from health workers related to use and side effects, Health facility use during pregnancy are still lacking, lack of awareness about the benefits of iron-folic acid, community trust, attitudes, and practices associated with the perception of women taking iron-folic acid tablets (Ejidokun, 2000).

Increased adherence to iron-folic acid for pregnant women increases productivity and reduces iron deficiency anemia during pregnancy which minimizes the risk of bleeding, sepsis, and maternal death and morbidity (WHO et al., 2012). Low adherence impairs energy levels, productivity, cognitive and physical development, and immune function. (Rahman et al., 2016). In addition, inadequate intake of iron and folic acid during pregnancy has adverse effects on neonatal such as; miscarriage, stillbirth, prematurity, low birth weight, congenital anomalies, and perinatal morbidity and mortality.

The compliance of pregnant women in taking iron tablets is a behavior. One of the factors that affect the realization of behavior is *reinforcing factors* (strengthening factors) in the form of facilities and community empowerment, in this case, is family or husband. Compliance of pregnant women in consuming folic acid supplements obediently in accordance with the advice of health workers needs the support and assistance of the husband or family. A form of husband support for maternal compliance in consuming folic acid supplements can be in the form of knowing and watching the mother when consuming.

The support of husbands from the family can encourage pregnant women to be more excited in the face of changes that occur during pregnancy, including maintaining the health of their pregnancy through increased pregnancy visits and supplement consumption. Pregnant women who get the attention and support of their husbands and families tend to be more receptive and follow the advice given by health workers compared to pregnant women who get less attention and support from husbands and families.

The role of the family (especially the husband) is an important factor that surrounds pregnant women by empowering family members, especially husbands, to help pregnant women improve their adherence to taking iron tablets. The husband is the closest person to the pregnant woman, which can create a physical and emotional environment that supports the health and nutrition of pregnant women. His concern is that paying attention to pregnant women's health, especially in monitoring the consumption of iron tablets every day is expected to improve the compliance of pregnant women in taking iron tablets.

CONCLUSION

Husband support in pregnant women who take Folic acid supplements for the improvement of Haemoglobin is an important factor and has a very large influence on the health of pregnant women, so cooperation is needed between health workers and the family, especially the husband, in order to improve the status of health.

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DECLARATION OF CONFLICTING INTEREST

This comprehensive summary or systematic review is independent writing, so there is no conflict of interest.

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AUTHOR CONTRIBUTION

Irmawati Designed the study, collected and analyzed articles, and contributed to completing a systematic review.

Andi Nilawati Usman: Contribution as a supervisor involved in planning and supervision in the completion of review literature.

Mardiana Ahmad: Contribution of guidance in discussing the final results of the review literature manuscript.

Nur Aliya Arsyad: Contribution is completion of review literature.

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