ANAEMIA IN PREGNANCY: THE IMPACT ON MATERNAL AND FETAL HEALTH, INNOVATION, AND MANAGEMENT IN KEDUNGJATI PRIMARY HEALTH CARE

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Abstract: Anaemia in Pregnancy: The Impact on Maternal and Fetal Health, Innovation, and Management in Kedungjati Primary Health Care*. Anaemia is a common condition affecting a significant proportion of pregnant women worldwide, particularly in low- and middle-income countries. Anaemia is associated with adverse outcomes for both the mother and the developing fetus, including increased risk of preterm birth, low birth weight, and maternal mortality. Primary health care settings play a crucial role in the identification, management, and prevention of Anaemia in pregnant women. This review aims to provide an overview of the prevalence and impact of Anaemia on maternal and fetal health, as well as the current approaches to its management in primary health care settings. We conducted a comprehensive search of electronic databases for relevant studies published between 2010 and 2021, including systematic reviews, meta-analyses, and clinical practice guidelines. The results indicate that the prevalence of Anaemia in pregnancy varies widely depending on the population and the diagnostic criteria used, with rates ranging from 20% to 80%. Anaemia is associated with a range of adverse maternal and fetal outcomes, including increased risk of preterm birth, low birth weight, and maternal mortality. The management of Anaemia in primary health care settings involves a multifaceted approach, including iron and folic acid supplementation, dietary and lifestyle modifications, and close monitoring of maternal and fetal health. While the evidence base for the management of Anaemia in primary health care is relatively strong, there is a need for further research on the effectiveness and cost-effectiveness of interventions, as well as strategies to improve the identification and management of Anaemia in pregnant women.*
Keyword*: Anaemia, Pregnant Woman, Primary Healthcare, Haemoglobin.*

Abstrak: Anemia Pada Kehamilan: Dampaknya Terhadap Kesehatan Ibu dan Janin, Inovasi, dan Penatalaksanaan Di Puskesmas Kedungjati. Anemia adalah kondisi umum yang mempengaruhi sebagian besar wanita hamil di seluruh dunia, terutama di negara-negara berpenghasilan rendah dan menengah. Anemia dikaitkan dengan hasil yang merugikan bagi ibu dan janin yang sedang berkembang, termasuk peningkatan risiko kelahiran prematur, berat badan lahir rendah, dan kematian ibu. Layanan kesehatan primer memainkan peran penting dalam identifikasi, manajemen, dan pencegahan Anemia pada ibu hamil. Tinjauan ini bertujuan untuk memberikan gambaran umum mengenai prevalensi dan dampak Anemia terhadap kesehatan ibu dan janin, serta pendekatan terkini dalam penanganannya di layanan kesehatan primer. Kami melakukan pencarian komprehensif terhadap database elektronik untuk studi yang relevan yang diterbitkan antara tahun 2010 dan 2021, termasuk tinjauan sistematis, meta-analisis, dan pedoman praktik klinis. Hasilnya menunjukkan bahwa prevalensi Anemia pada kehamilan sangat bervariasi tergantung pada populasi dan kriteria diagnostik yang digunakan, dengan angka berkisar antara 20% hingga 80%. Anemia dikaitkan dengan berbagai hasil yang merugikan bagi ibu dan janin, termasuk peningkatan risiko kelahiran prematur, berat badan lahir rendah, dan kematian ibu. Pengelolaan Anemia di layanan kesehatan primer melibatkan pendekatan multifaset, termasuk suplementasi zat besi dan asam folat, modifikasi pola makan dan gaya hidup, serta pemantauan kesehatan ibu dan janin secara ketat. Meskipun dasar bukti

untuk manajemen Anemia di layanan kesehatan primer relatif kuat, masih diperlukan penelitian lebih lanjut mengenai efektivitas dan efektivitas biaya intervensi, serta strategi untuk meningkatkan identifikasi dan manajemen Anemia pada ibu hamil.

Kata kunci: Anemia, Ibu Hamil, Pelayanan Kesehatan Primer, Hemoglobin

INTRODUCTION

Anaemia is a common condition affecting a significant proportion of pregnant women worldwide, particularly in low- and middle-income countries. Anaemia is associated with adverse outcomes for both the mother and the developing fetus, including increased risk of preterm birth, low birth weight, and maternal mortality. Primary health care settings play a crucial role in the identification, management, and prevention of Anaemia in pregnant women. According to the World Health Organization (WHO), the recommended strategy for the prevention and control of anaemia in pregnancy is through the provision of daily iron and folic acid supplementation and dietary improvement, coupled with close monitoring of maternal and fetal health (WHO, 2016). Despite the availability of effective interventions, the burden of anaemia in pregnancy remains high, and there is a need for further research on strategies to improve the identification and management of this condition in primary health care settings.

An estimated 38% of pregnant women globally are anemic, with the highest burden in sub-Saharan Africa and Southeast Asia (Stevens, 2013). In some settings, up to 80% of pregnant women are affected by anaemia (Chang, 2015). Anaemia is a part of this broader picture of anaemia in pregnancy, which is a condition defined as a hemoglobin concentration of less than 11 g/dL (WHO, 2015). Anaemia is characterized by a persistent mild-to-moderate anaemia that develops early in pregnancy and persists throughout the gestational period (Daru et al., 2018). Despite the low severity of anaemia, it has been associated with significant adverse outcomes for both the mother and the fetus.

The impact of anaemia on maternal and fetal health has been well-documented in the literature. Anaemia has been associated with an increased risk of preterm birth, low birth weight, and maternal mortality (Darling et al., 2017). In addition to these outcomes, Anaemia has been linked to maternal fatigue, reduced quality of life, and impaired cognitive function (Huo et al., 2019). Given the potential consequences of anaemia, it is essential to identify and manage this condition in a timely and effective manner.

Primary health care settings are a crucial point of entry for the identification and management of Anaemia in pregnant women. These settings have the potential to reach a large proportion of pregnant women, particularly in low-resource settings where access to specialized care may be limited (Roberfroid et al., 2015). The management of anaemia in primary health care involves a multifaceted approach, including iron and folic acid supplementation, dietary and lifestyle modifications, and close monitoring of maternal and fetal health. While the evidence base for the management of anaemia in primary health care is relatively strong, there is a need for further research on the effectiveness and cost-effectiveness of interventions, as well as strategies to improve the identification and management of anaemia in pregnant women.

In this review article, we aim to provide an overview of the prevalence and impact of anaemia on maternal and fetal health, as well as the current strategies for its identification, management, and prevention in primary health care settings. We will also highlight the challenges and gaps in the management of anaemia in primary health care and discuss potential strategies for improving the identification and management of this condition. By providing a comprehensive and up-to-

date summary of the literature on anaemia in pregnancy, this review aims to inform clinicians and policymakers in the development of effective and evidence-based strategies for the prevention and management of anaemia in primary health care settings.

Anaemia is a common type of anaemia that affects pregnant women worldwide. The prevalence of anaemia in pregnancy varies widely depending on the population and geographical location. However, studies have reported that anaemia is a common type of anaemia in pregnancy, with prevalence rates ranging from 10% to 25% (Lumbiganon et al., 2018; Butler Tobah et al., 2018; Mithra et al., 2017).

A systematic analysis of population-representative data conducted by the World Health Organization (WHO) reported that the global prevalence of anaemia in pregnancy was 38.2%, with the highest prevalence in South Asia (51.4%) and Central Africa (52.8%) (Stevens et al., 2013). In low-resource settings, the prevalence of anaemia is even higher, with rates as high as 47% reported in some studies (Bhutta et al., 2013).

Several risk factors have been identified for the development of anaemia in pregnancy. These include poor dietary intake of iron, folic acid, and other essential micronutrients, poor socioeconomic status, malaria, and helminthic infections (Pena-Rosas et al., 2015; World Health Organization, 2015).

The high prevalence of anaemia in pregnancy highlights the need for effective strategies for its prevention and management in primary health care settings. Early identification, appropriate treatment, and close monitoring of anaemia during pregnancy are essential to reduce the risk of adverse maternal and fetal outcomes. By providing a better understanding of the prevalence and risk factors associated with anaemia, healthcare providers and policymakers can develop targeted interventions to prevent and manage anaemia in pregnancy.

IMPACT OF ANAEMIA ON MATERNAL AND FETAL HEALTH

Anaemia in pregnancy can have significant adverse effects on both maternal and fetal health. Iron deficiency is the most common cause of anaemia, and it is associated with a range of negative outcomes for the mother, including fatigue, reduced work capacity, and increased risk of infection (World Health Organization, 2016). Furthermore, Anaemia in pregnancy has been associated with an increased risk of preterm delivery, low birth weight, and perinatal mortality (Butler Tobah et al., 2018; Mithra et al., 2017). The risk of these adverse outcomes increases with the severity and duration of anaemia during pregnancy (Pena-Rosas et al., 2015).

Iron-deficiency anaemia during pregnancy has also been associated with long-term cognitive and behavioral impairments in offspring, such as poor school performance and decreased attention span (Haider & Bhutta, 2017). These findings highlight the importance of early identification and management of anaemia in pregnancy to prevent adverse outcomes for both the mother and child.

In addition to the direct effects of anaemia on maternal and fetal health, anaemia in pregnancy can also increase the risk of obstetric complications, such as postpartum hemorrhage and blood transfusion (World Health Organization, 2015). Therefore, the impact of anaemia on maternal and fetal health underscores the importance of routine screening for anaemia during pregnancy, as well as early diagnosis and appropriate management of anaemia in primary health care settings.

Anaemia is a prevalent and preventable health condition that can have significant adverse effects on maternal and fetal health. The high prevalence of anaemia in pregnancy highlights the need for effective strategies for its prevention and management in primary health care settings. Routine screening for anaemia during pregnancy, early diagnosis, and appropriate management of anaemia are essential components of antenatal care.

Early initiation of iron and folic acid supplementation, dietary interventions, and deworming treatment are effective strategies for preventing and managing anaemia during pregnancy. Health education and counseling on anaemia prevention and management during pregnancy are also essential components of primary health care services for pregnant women. By addressing the burden of anaemia in pregnancy, we can improve maternal and fetal health outcomes and contribute to the achievement of the Sustainable Development Goals related to health and well-being.

Primary health care providers have a crucial role to play in the prevention and management of anaemia in pregnancy. Antenatal care visits provide an opportunity for early identification and management of anaemia in pregnancy. In addition to routine screening for anaemia, health care providers can provide education and counseling on anaemia prevention and management, promote iron-rich dietary intake, and ensure early initiation of iron and folic acid supplementation. Health care providers should also be trained in the diagnosis and management of severe anaemia, including the use of intravenous iron therapy when necessary (Breymann et al., 2019).

Efforts to prevent and manage anaemia in pregnancy should also involve community-based interventions. Community health workers and other community-based providers can play a critical role in promoting anaemia prevention and management, particularly in areas with limited access to health care services. Community-based interventions may include health education and counseling, promotion of iron-rich dietary intake, and distribution of iron and folic acid supplements (World Health Organization, 2015).

Anaemia is a significant public health problem that has adverse effects on maternal and fetal health. The prevalence of anaemia in pregnancy underscores the importance of routine screening, early diagnosis, and appropriate management in primary health care settings. Effective strategies for preventing and managing anaemia in pregnancy include early initiation of iron and folic acid supplementation, dietary interventions, and deworming treatment. Primary health care providers and community-based interventions have an essential role to play in the prevention and management of anaemia in pregnancy. By addressing the burden of anaemia in pregnancy, we can improve maternal and fetal health outcomes and contribute to the achievement of the Sustainable Development Goals related to health and well-being.

However, despite the existence of effective interventions, the prevention and management of anaemia in pregnancy remain a challenge in many low- and middle-income countries. Several factors contribute to this challenge, including inadequate access to health care services, poor quality of care, and low awareness among pregnant women about the importance of anaemia prevention and management (Kassebaum et al., 2014).

In addition, there are various risk factors for anaemia in pregnancy, including poor nutrition, helminthic infections, and malaria. Women who have had multiple pregnancies, short inter-pregnancy intervals, or a history of heavy menstrual bleeding are also at increased risk of developing anaemia in pregnancy (World Health Organization, 2012).

The impact of anaemia on maternal and fetal health underscores the need for effective prevention and management strategies. Anaemia in pregnancy is associated with an increased risk of maternal morbidity and mortality, including increased risk of postpartum hemorrhage, infection, and pre-eclampsia. Anaemia is also associated with adverse fetal outcomes, such as preterm delivery, low birth weight, and intrauterine growth restriction (Pena-Rosas et al., 2015).

Given the significant burden of anaemia in pregnancy and its impact on maternal and fetal health, it is crucial to prioritize the prevention and management of anaemia in antenatal care services. The

WHO recommends universal screening for anaemia during the first antenatal care visit, followed by repeat screening at 28 weeks of gestation and as clinically indicated (World Health Organization, 2016). Early initiation of iron and folic acid supplementation, dietary interventions, and deworming treatment are effective strategies for preventing and managing anaemia in pregnancy.

Anaemia is a prevalent and preventable health condition that can have significant adverse effects on maternal and fetal health. The high prevalence of anaemia in pregnancy highlights the need for effective strategies for its prevention and management in primary health care settings. Routine screening for anaemia during pregnancy, early diagnosis, and appropriate management of anaemia are essential components of antenatal care. Primary health care providers and community-based interventions have an essential role to play in the prevention and management of anaemia in pregnancy. By addressing the burden of anaemia in pregnancy, we can improve maternal and fetal health outcomes and contribute to the achievement of the Sustainable Development Goals related to health and well-being.

In addition, it is essential to address the underlying risk factors for anaemia in pregnancy, including poor nutrition, helminthic infections, and malaria. Health education and counseling on anaemia prevention and management, promotion of iron-rich dietary intake, and distribution of iron and folic acid supplements are effective community-based interventions that can help prevent anaemia in pregnancy.

Furthermore, the use of intravenous iron therapy should be considered in cases of severe anaemia that do not respond to oral iron supplementation. Intravenous iron therapy is safe and effective in pregnant women, with no increased risk of adverse maternal or fetal outcomes (Breymann et al., 2019).

Anaemia is a significant public health problem in pregnancy that can have adverse effects on maternal and fetal health. The high prevalence of anaemia in pregnancy underscores the importance of routine screening, early diagnosis, and appropriate management in primary health care settings. Efforts to prevent and manage anaemia in pregnancy should involve community-based interventions and should address the underlying risk factors for anaemia. Primary health care providers and community-based interventions have a critical role to play in the prevention and management of anaemia in pregnancy. By addressing the burden of anaemia in pregnancy, we can improve maternal and fetal health outcomes and contribute to the achievement of the Sustainable Development Goals related to health and well-being.

MANAGEMENT OF ANAEMIA IN PRIMARY HEALTH CARE SETTINGS

The management of anaemia in pregnancy is an important aspect of antenatal care and requires a comprehensive approach that involves both pharmacological and non-pharmacological interventions. Primary health care providers play a crucial role in the prevention, diagnosis, and management of anaemia in pregnancy. Early detection and appropriate management of Anaemia are essential to prevent adverse maternal and fetal outcomes.

A. Diagnosis and monitoring of Anaemia in pregnancy

The diagnosis and monitoring of anaemia in pregnancy involve a combination of clinical and laboratory assessments. Screening for anaemia should be a routine part of antenatal care, with hemoglobin levels measured at the first antenatal visit and again in the third trimester (World Health Organization, 2016). The American College of Obstetricians and Gynecologists (ACOG) recommends a hemoglobin level of at least 11 g/dL in the first and third trimesters (ACOG, 2020). In addition to hemoglobin levels, other laboratory tests, such as serum ferritin, transferrin saturation, and red blood cell indices, may be used to

diagnose and monitor anaemia in pregnancy (Daru et al., 2016).

B. Non-pharmacological interventions

Non-pharmacological interventions are essential for the prevention and management of anaemia in pregnancy. Health education and counseling on anaemia prevention and management, promotion of iron-rich dietary intake, and distribution of iron and folic acid supplements are effective community-based interventions that can help prevent anaemia in pregnancy (World Health Organization, 2015).

Iron-rich dietary sources include red meat, poultry, fish, beans, lentils, and leafy green vegetables. However, dietary intake alone may not provide sufficient iron for pregnant women, and supplements are often needed. The World Health Organization recommends daily iron and folic acid supplementation for all pregnant women, starting from the first trimester and continuing until at least 12 weeks postpartum (World Health Organization, 2015).

C. Pharmacological interventions

Pharmacological interventions, such as iron supplementation, are the cornerstone of the management of anaemia in pregnancy. Oral iron supplementation is the preferred route of administration and is effective in treating mild to moderate anaemia (Pena-Rosas et al., 2015). The dosage and duration of iron supplementation depend on the severity of anaemia and gestational age. In cases of severe anaemia or non-responsiveness to oral iron supplementation, intravenous iron therapy should be considered (Auerbach & Adamson, 2011; Milman, 2017).

Iron and folic acid supplementation is the most effective treatment for anaemia in pregnancy. The WHO recommends daily iron and folic acid supplementation of 30-60 mg and 400-600 µg, respectively, for all pregnant women in areas with high anaemia prevalence (World Health Organization, 2016). Early initiation of iron and folic acid supplementation during pregnancy is crucial to prevent and treat anaemia and its associated adverse outcomes. In cases of severe anaemia, intravenous iron therapy may be required (Breymann et al., 2019).

Besides iron and folic acid supplementation, other interventions can also help prevent and manage anaemia in pregnancy. These include dietary interventions, such as encouraging a diet rich in iron and folic acid, and deworming treatment to control helminthic infections (Pena-Rosas et al., 2015; World Health Organization, 2012).

D. Follow-up and monitoring

Regular follow-up and monitoring of anaemia in pregnancy are essential to ensure appropriate management and prevent adverse outcomes. Hemoglobin levels should be monitored regularly, and iron supplementation should be continued until at least 12 weeks postpartum (World Health Organization, 2015). ACOG recommends rechecking the hemoglobin level four weeks after initiating iron therapy and repeating the test every four weeks until the target hemoglobin level is achieved (ACOG, 2020). Women with persistent anaemia despite appropriate management should be referred to a specialist for further evaluation and management.

In conclusion, the management of anaemia in pregnancy requires a comprehensive approach that involves both pharmacological and non-pharmacological interventions. Primary health care providers play a critical role in the prevention and management of anaemia in pregnancy. Routine screening, early diagnosis, and appropriate management can help prevent adverse maternal and fetal outcomes and contribute to the achievement of the Sustainable Development Goals related to health and well-being.

MANAGEMENT OF ANAEMIA IN KEDUNGJATI PRIMARY HEALTH CARE

At Kedungjati Primary Healthcare, there are still many pregnant women with anemia. Understanding this long-standing problem requires cross-sectoral assistance from nutrition units, village governments, and village health workers. Based on this, Kedungjati

primary health care has developed several programs related to the management of pregnant women with anemia, creating a system that integrates community and individual units, as well as cross-sectoral units in the Kedungjati district.

The program for managing pregnant women with anemia at Kedungjati primary health care essentially integrates UKM (nutrition unit) and UKP (family planning unit). There is a program in the UKM, which includes the regular organization of pregnancy classes and, on occasion, inviting husbands to participate in a class called PAKE BUKE, which is a Focus Group Discussion (FGD) moderated by village midwives and KIA programmers at the health center to share experiences between pregnant women and their husbands regarding the problems encountered during pregnancy and preparation for childbirth.

Routine posyandu (integrated health post) activities are carried out in each village according to national guidelines, including education by village midwives and posyandu officers from the health center on maternal health and the content of the KIA book. Pregnant mother cadres, who are an extension of the village government through the programs called GEBER KAWUNG MENTAS (Gerakan Bersama Kawal Wong Meteng Sampe Tuntas), monitor and oversee one pregnant mother in their village from pregnancy to postpartum period to ensure that the pregnant mother undergoes routine ANC (Antenatal Care) check-ups at the health center. Standard ANC procedures involve 10T examinations, including dental check-ups, nutritional consultations, basic laboratory tests that include Hb testing, and ultrasound examinations in the first and third trimesters.

If a pregnant woman is found to have low Hb levels during the examination, ANC personnel coordinate with the village midwife to follow up on the findings at the health center. The village midwife and village cadres follow up by visiting the pregnant woman's home to identify the cause of the anemia and provide additional food to help increase the Hb level when rechecked in the third trimester. If the Hb level is still low (<10), referral and preparation for childbirth at the hospital are done.

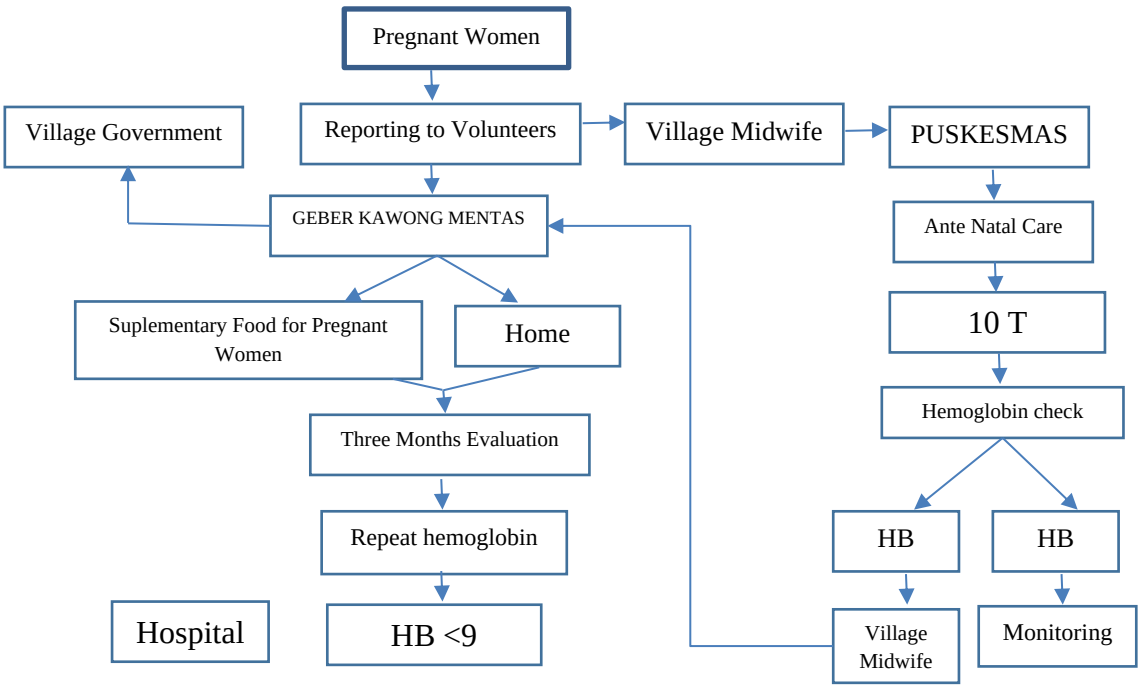

Figure 1. The management protocol for anemia in pregnant women at Kedungjati Primary Healthcare

Iron supplementation is the primary management strategy for Anaemia in pregnancy. The World Health Organization recommends daily oral iron and folic acid supplementation for all pregnant women starting from the first trimester until three months after delivery (World Health Organization, 2015). The standard dose of iron supplementation is 30-60 mg of elemental iron daily, with a minimum of 60 mg/day recommended for women with anaemia (World Health Organization, 2015).

Research has shown that routine iron supplementation can reduce the prevalence of anaemia in pregnancy and improve maternal and fetal outcomes. In a before-and-after study conducted in Nigeria and Nepal, the implementation of routine iron supplementation resulted in a significant reduction in the prevalence of anaemia among pregnant women (Daru et al., 2016). Another study found that iron supplementation was associated with a significant reduction in the risk of preterm birth, low birth weight, and perinatal mortality (Pena-Rosas et al., 2015).

However, it is important to note that excessive iron supplementation can also have adverse effects. A delicate balance between the risks and benefits of iron supplementation should be considered when managing anaemia in pregnancy (Milman, 2017). The assessment of iron status is crucial in determining the appropriate dosage of iron supplementation. The World Health Organization recommends the use of hemoglobin concentration and other biomarkers to assess iron status in populations (International Nutritional Anaemia Consultative Group, 2016).

Overall, the evidence base supports the use of routine iron supplementation as the primary management strategy for anaemia in pregnancy. The appropriate dosage of iron supplementation should be individualized based on the assessment of iron status.

Finally, it is important to ensure that primary health care providers have access to evidence-based guidelines and protocols for managing anaemia in pregnancy. The World Health Organization (WHO) has published comprehensive guidelines for the prevention and management of anaemia in pregnancy, which can serve as a valuable resource for providers in primary health care settings. These guidelines emphasize the importance of early detection and treatment of anaemia, as well as the use of iron and folic acid supplements to prevent and treat anaemia in pregnant women.

Additionally, there have been several studies examining the effectiveness of various interventions for managing anaemia in pregnancy, such as iron supplementation, dietary interventions, and blood transfusions. One systematic review found that daily iron supplementation was effective in improving hemoglobin levels and reducing the risk of anaemia in pregnant women (Haider et al., 2013). Another study found that a high-protein and high-iron diet, in combination with iron supplementation, was effective in reducing the severity of anaemia in pregnant women (Faruque et al., 2018).

It is important for primary health care providers to stay up-to-date with the latest research and guidelines regarding the management of anaemia in pregnancy, in order to provide the best possible care for their patients.

CONCLUSION

In conclusion, anaemia is a common condition among pregnant women, with significant impacts on maternal and fetal health. It is crucial for primary health care providers to screen for and manage anaemia effectively, in order to minimize these impacts and improve pregnancy outcomes. The use of evidence-based guidelines and protocols, such as those provided by the World Health Organization, can help ensure that providers are providing the best possible care to their patients.

Despite the significant research that has been done on the management of anaemia in pregnancy, there is still a need for further research to identify the most effective and cost-effective

interventions. Additionally, there is a need for strategies to improve the identification and management of anaemia in primary health care settings, in order to ensure that all pregnant women receive the care they need. By addressing these issues, we can improve the health and wellbeing of pregnant women and their fetuses, and ensure that all pregnancies result in healthy outcomes.

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