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MATERNAL OUTCOME IN BOOKED AND NONBOOKED PREGNANT WOMEN WITH IRON DEFICIENCY ANEMIA AT SHAIKH ZAYAD WOMEN'S HOSPITAL, LARKANA

Dr. Majida Ali[*1]

[*1]Shaikh Zayad Women's Hospital, Larkana.

[*1]majidaali110@gamil.com

Dr. Mahrukh Noonari[2]

[2]Shaikh Zayad Women's Hospital, Larkana.

Dr. Bakhtawar Khoso[3]

[3]Shaikh Zayad Women's Hospital, Larkana.

Dr. Fiza Nihal[4]

[4]Shaikh Zayad Women's Hospital, Larkana.

Dr. Shazia Shaikh[5]

[5]Shaikh Zayad Women's Hospital, Larkana.

Fatima Akbar[6]

[6]Larkana Institute of Nursing and Allied Health Sciences.

Author Details

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Corresponding E-mails & Authors*:
Dr. Majida Ali
majidaali110@gamil.com

Abstract

Objective of Study: Study was to determine the effects of antenatal booking status on pregnant women with iron deficiency anemia as well as fetomaternal outcomes.

Methodology: From January 2021 to December 2021 a retrospective comparative study was conducted at Shaikh Zayed Women Hospital in Larkana. One hundred pregnant women with an iron deficiency anemia diagnosis were included and they were split into two groups: those who were scheduled and those who werent. Comparing the fetomaternal complications of the two groups was the main goal.

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Results: Of the 100 participants 56% were not scheduled for prenatal care and 44% were. There were 31 non-booked women and 19 booked women among all anemic patients in the study population suggesting that non-booked patients had a higher percentage of anemia-related cases. Maternal and fetal complications were more common in non-booked women than in booked women which can be attributed to insufficient prenatal monitoring and postponed clinical care. **Conclusion:** Pregnancy outcomes for women with iron deficiency anemia are significantly improved by prenatal booking according to the study. While not making an appointment is linked to more unfavorable outcomes during pregnancy and labor routine prenatal follow-up is linked to fewer fetomaternal complications. Maternal health and the prognosis of the fetus can be greatly improved by early registration and prompt prenatal care.

INTRODUCTION

A decrease in hemoglobin concentration or red blood cell count below what is needed to meet the body's physiological oxygen demands is known as anemia a hematological disorder. It affects almost one-fourth of the worlds population especially women of reproductive age and pregnant women and is regarded as one of the most prevalent nutritional disorders (1). Because of the increased nutritional and metabolic demands necessary for both maternal health and fetal growth anemia becomes more significant during pregnancy. The most common type of anemia seen during pregnancy is iron deficiency anemia (2). When the body's iron reserves are insufficient for sufficient hemoglobin synthesis iron deficiency anemia occurs. Due to the growth of the fetus placental development and expansion of the mothers blood volume pregnancy raises the need for iron. Anemia occurs when iron reserves and dietary intake are insufficient to meet

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these requirements. Iron deficiency anemia during pregnancy is caused by a number of factors such as poor nutrition low socioeconomic status multiparity short birth intervals smoking advanced gestational age and inadequate prenatal care (3). The human body uses iron an essential micronutrient for a number of vital physiological processes. Hemoglobin synthesis oxygen transport enzymatic activities electron transport mechanisms immunological function and fetal development are all significantly impacted by it. Maintaining healthy skin hair and nails also depends on having enough iron in the body. To meet the growing needs of the developing fetus and the mother the daily iron requirement increases significantly during pregnancy (4). If untreated iron deficiency anemia can cause major problems for both the mother and the fetus. Weakness exhaustion agitation lightheadedness palpitations dyspnea and diminished productivity are among the maternal complications. Heart failure antepartum hemorrhage postpartum hemorrhage pre-eclampsia eclampsia and elevated maternal mortality can all result from severe anemia. Intrauterine growth restriction low birth weight preterm birth fetal distress prenatal mortality and neonatal death are among the adverse fetal outcomes linked to maternal anemia (5). Hemoglobin concentration is used to categorize the degree of anemia. Hemoglobin levels between 10. 0 and 10. 9 g/dL are considered mild anemia 7–9. 9 g/dL are considered moderate anemia less than 7 g/dL is considered severe anemia and less than 4 g/dL is considered very severe anemia (5). Reduced hemoglobin concentration low mean corpuscular volume (MCV) low mean corpuscular hemoglobin (MCH) and low mean corpuscular hemoglobin concentration (MCHC) are all laboratory tests used to diagnose iron deficiency anemia. However since physiological hemodilution can change hematological indices it is important to interpret these parameters carefully during pregnancy (6). Reducing maternal and fetal morbidity and mortality requires early

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detection and appropriate management of iron deficiency anemia. Effective methods for preventing anemia during pregnancy and enhancing overall pregnancy outcomes include regular prenatal screening nutritional counseling iron supplementation and health education initiatives.

METHODOLOGY:

In order to assess maternal outcomes among pregnant women with iron deficiency anemia who were booked and those who were not a comparative cross-sectional study was carried out at the Department of Gynecology and Obstetrics Shaikh Zayed Women Hospital Larkana over a one-year period from January 2021 to December 2021. Convenient sampling was used to enroll 100 pregnant women with iron deficiency anemia in the study. Primigravida and multigravida women between the ages of 22 and 49 who had gestational ages ranging from preterm (less than 37 weeks) to term pregnancies (37–42 weeks) as determined by the results of ultrasonography and the last menstrual cycle were among the participants. The study excluded pregnant women with anemia brought on by conditions other than iron deficiency such as hemoglobinopathies and chronic systemic diseases. Every participant provided written informed consent before any data was collected. A structured proforma was used to collect comprehensive demographic and obstetric data such as age booking status residence educational status monthly income gravidity parity gestational age body mass index presenting complaints mode of admission dietary habits prior history of anemia history of blood transfusions and obstetric complications like antepartum hemorrhage postpartum hemorrhage and pre-eclampsia. To evaluate anemia-related signs and symptoms such as pallor palpitations dyspnea edema and generalized weakness a comprehensive clinical examination was

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carried out. Measurements of hemoglobin concentration packed cell volume (PCV) mean corpuscular hemoglobin (MCH) mean corpuscular hemoglobin concentration (MCHC) serum ferritin and total iron-binding capacity (TIBC) were among the laboratory tests used to confirm iron deficiency anemia and assess its severity. While fetal outcomes included preterm birth intrauterine growth restriction (IUGR) intrauterine death (IUD) fresh stillbirth (FSB) macerated stillbirth (MSB) neonatal death (NND) and low birth weight maternal outcomes evaluated during the study included mode of delivery postpartum hemorrhage need for blood transfusion prolonged hospital stay and maternal morbidity. In order to track immediate maternal and neonatal outcomes all patients were observed throughout their hospital stay and for two to three days following delivery. Using IBM SPSS Statistics statistical analysis was carried out.

RESULT:

The obstetric and demographic features of pregnant women with iron deficiency anemia who were booked and those who weren't are shown in Figure 1. 0. In the age group the proportion of booked women was higher (76%) than that of non-booked women (23%). However compared to booked women (32 percent) parity was more prevalent among non-booked women (68 percent). In a similar vein non-booked patients had a higher distribution of gestational age (61%) than booked patients (39%). Additionally labor pain with complications was noted in 26% of patients and presenting complaints were more common in non-booked women (48%) than in booked women (25%). Only 22% of the booked group consisted of nulliparous women. Overall booked women made up 44% of the study population whereas non-booked women made up 56%. This suggests that non-booked pregnant women had worse antenatal follow-up.

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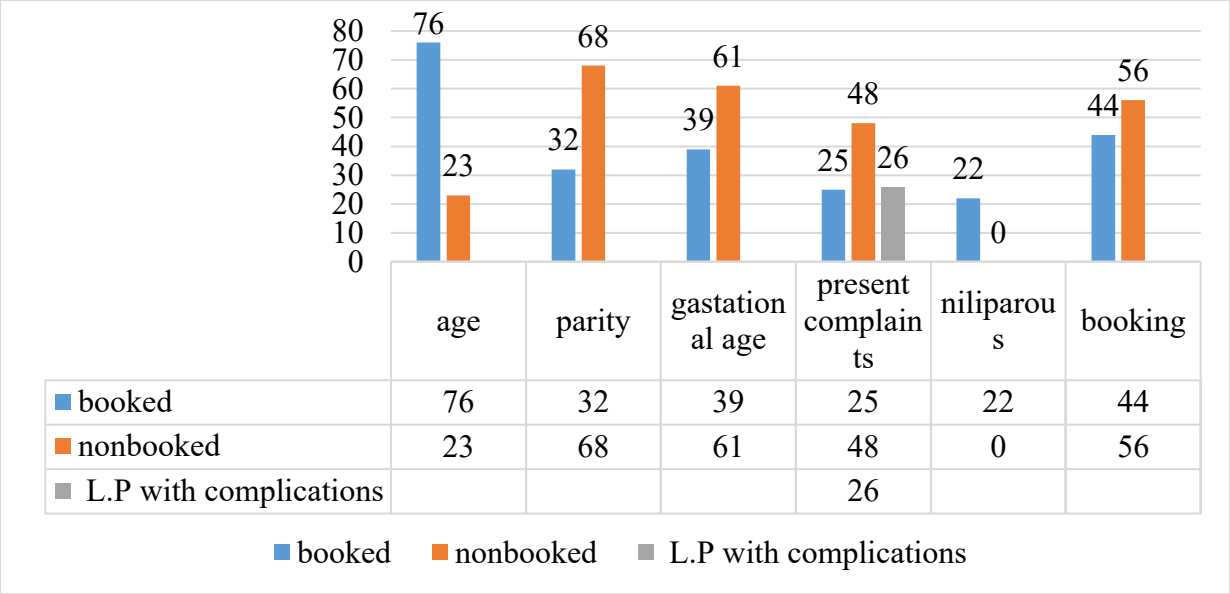

Figure 1.0 Figure 1.0: Distribution of Demographic and Obstetric Characteristics Among Booked and Non-Booked Pregnant

The distribution of pregnant women with iron deficiency anemia by mode of delivery body mass index (BMI) need for blood transfusions anemia status and severity of anemia is shown in Figure 2. 0. The mode of delivery was slightly more common in moderate anemia (52 percent) than in mild anemia (48 percent). In terms of BMI mild anemia made up 38% of cases whereas moderate and severe anemia made up 24% and 26% respectively. Women with mild anemia (80%) needed blood transfusions more frequently than those with moderate anemia (20%) and severe anemia (3%). Only five percent of cases had severe anemia while the prevalence of anemia was equal in the mild and moderate categories each accounting for fifty percent of cases. Moderate anemia was the most prevalent type (37 percent) followed by severe anemia (7 percent) and mild anemia (6 percent) in terms of severity. Overall the figure shows that while severe anemia was seen in fewer instances moderate anemia was more common among study participants.

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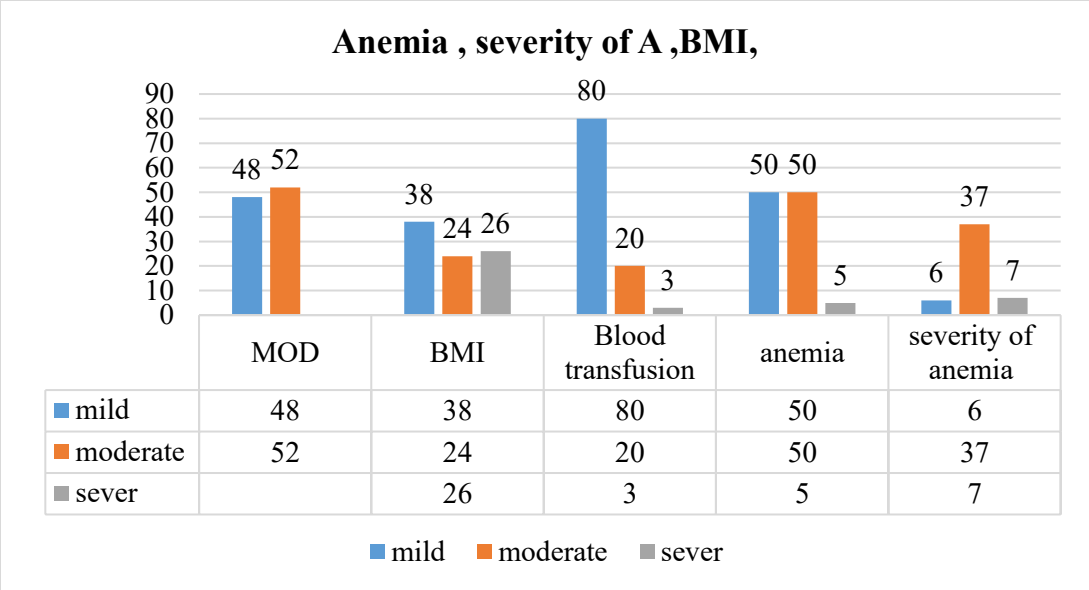

Figure 2.0: Distribution of Mode of Delivery, BMI, Blood Transfusion, and Severity of Anemia Among Pregnant Women with Iron Deficiency Anemia

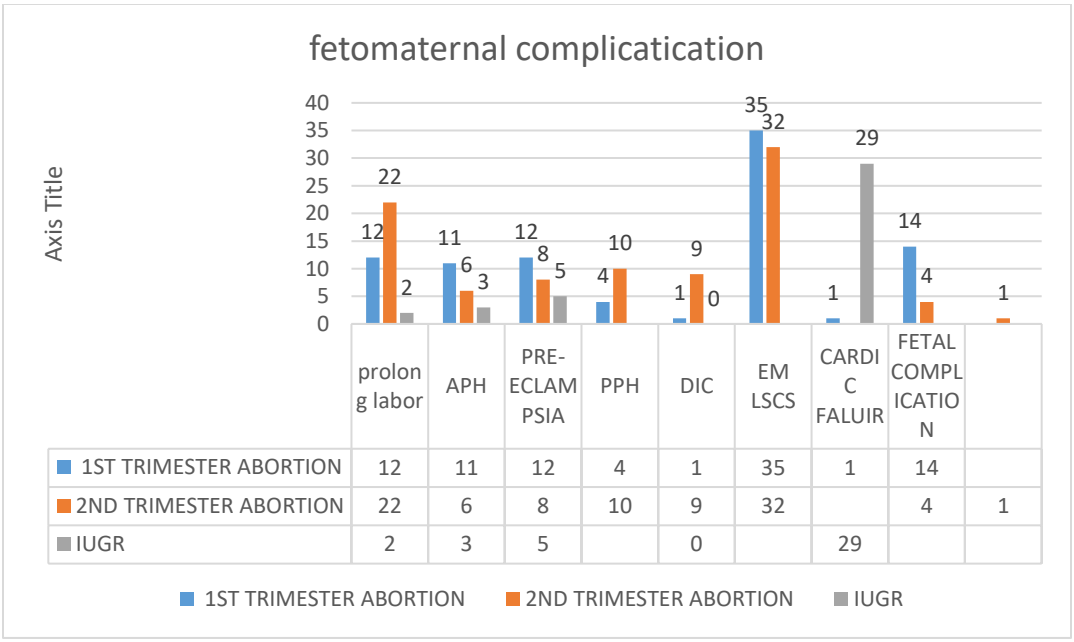

Figure 3.0: Distribution of Fetomaternal Complications Among Pregnant Women with Iron Deficiency Anemia

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The frequency of fetomaternal complications seen in pregnant women with iron deficiency anemia is shown in Figure 3. 0. Compared to first-trimester abortions (12 percent) and IUGR cases (2 percent) prolonged labor was more common in second-trimester abortion cases (22 percent). Antepartum hemorrhage (APH) was reported in 11% of cases of first-trimester abortions whereas IUGR (3%) and second-trimester abortions (6%) had lower rates. Twelve percent of first-trimester abortion cases eight percent of second-trimester abortion cases and five percent of IUGR cases had pre-eclampsia. Compared to first-trimester abortion cases (4%) postpartum hemorrhage (PPH) was more common in second-trimester abortion cases (10%). Additionally there was a greater incidence of disseminated intravascular coagulation (DIC) in second-trimester abortion cases (9%) than in first-trimester abortion cases (1%). With 35% of first-trimester abortions and 32% of second-trimester abortions emergency lower segment cesarean sections (EMLSCS) had the highest frequency. While fetal complications were more common in first-trimester abortion cases (14 percent) than in second-trimester abortion cases (4 percent) cardiac failure was primarily linked to IUGR cases (29 percent). Overall the figure shows that women with iron deficiency anemia were more likely to experience severe maternal and fetal complications especially in cases of IUGR and second-trimester abortion.

DISCUSSION:

One of the biggest global public health issues is still iron deficiency anemia which primarily affects pregnant and reproductive-age women. The World Health Organization (WHO) estimates that approximately two billion people or 40% of the worlds population suffer from iron deficiency anemia with pregnant women being disproportionately

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affected because of the increased physiological demands of pregnancy (7). The burden is substantially greater in developing nations than in developed ones primarily as a result of socioeconomic inequality poor nutrition and restricted access to healthcare. Further evidence of significant regional variation in the prevalence of anemia among pregnant women comes from global epidemiological data. Africa (44 percent) the Western Pacific (39 percent) the Americas (29 percent) and Europe (20 percent) had relatively lower prevalence rates than South-East Asia (79 percent) Central Asia (80 percent) and India (88 percent) according to WHO statistics from 1996 (8). These variations are a reflection of disparities in dietary habits preventive health measures and maternal healthcare systems among various regions especially in low- and middle-income nations. Numerous unfavorable outcomes for both the mother and the fetus are closely linked to iron deficiency anemia during pregnancy. Preterm labor premature rupture of membranes pre-eclampsia antepartum hemorrhage (APH) postpartum hemorrhage (PPH) infections and heart failure are examples of maternal complications. Intrapartum complications including an increase in surgical deliveries genital tract injuries fetal distress and perinatal mortality are also documented in severe cases (9). These observations are supported by the current study's findings which showed that fetomaternal complications were more common in women with iron deficiency anemia. Because of the expansion of the mothers blood volume the growth of the fetus and the development of the placenta the physiological demands of pregnancy greatly increase the need for iron. The daily iron requirement rises from roughly 0. 8 mg during the first trimester to roughly 7. 5 mg during the second and third trimesters with an average daily requirement of about 4. 4 mg during pregnancy. Anemia results from the depletion of iron stores when these increased demands are not satisfied by diet or supplementation. Inadequate dietary intake poor

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iron absorption low levels of education and insufficient prenatal care coverage are all contributing factors in settings with limited resources (10). The detrimental effects of iron deficiency anemia on fetal and maternal health outcomes have also been emphasized by earlier studies. The majority of research indicates a strong correlation between iron deficiency anemia and increased maternal and fetal morbidity and mortality despite the fact that some studies have found no statistically significant association between hematological parameters and outcomes like intrauterine growth restriction (IUGR) and preterm birth (9). Variations in study design population characteristics sample size and anemia severity may be the cause of these discrepancies. From a physiological point of view pregnancy is linked to physiological hemodilution or increased plasma volume which can make it more difficult to interpret hematological indices. When iron stores are further depleted in later stages of pregnancy iron deficiency anemia usually manifests as microcytic hypochromic anemia which is characterized by decreased mean corpuscular volume (MCV) (10). However red cell mass may rise but appear somewhat diluted due to plasma volume expansion complicating laboratory interpretation. One of the most trustworthy markers of the body's iron reserves is serum ferritin. Iron deficiency is typically indicated by levels below 30 ng/mL while values between 30 and 300 ng/mL depending on the clinical context are regarded as normal (11). Therefore early diagnosis and prompt treatment of iron deficiency anemia are crucial for preventing serious complications for both the mother and the fetus during pregnancy. The current study's results also highlight the necessity of improving maternal healthcare services especially routine screening programs nutritional counseling and antenatal care coverage. The burden of unfavorable pregnancy outcomes can be considerably decreased by early detection and appropriate treatment of iron deficiency anemia through dietary changes and iron supplementation.

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However the study's single-center design and small sample size are some of its drawbacks which could restrict how broadly the results can be applied. To better understand the long-term effects of iron deficiency anemia on maternal and fetal outcomes in the Pakistani population larger multicenter longitudinal studies are advised for future research (12).

Conclusion:

The current study shows that pregnant women with iron deficiency anemia at Shaikh Zayed Women Hospital in Larkana who were booked and those who were not had significantly different maternal outcomes. Due to routine prenatal monitoring booked women showed significantly better pregnancy outcomes including a lower incidence of obstetric complications and better clinical management. On the other hand delayed presentation and a lack of prenatal supervision were the main causes of the higher frequency of unfavorable maternal outcomes among non-booked women. The results highlight how crucial early registration regular prenatal care and prompt intervention are to enhancing maternal health outcomes and lowering pregnancy-related complications related to anemia.

REFERENCES

Gautam, Sujan, Haju Min, Heenyun Kim, and Hyoung-Sun Jeong. "Determining factors for the prevalence of anemia in women of reproductive age in Nepal: Evidence from recent national survey data." *PloS one* 14, no. 6 (2019): e0218288.

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Online ISSN 3007-2387
Print ISSN 3007-2379

DOI: http://doi.org/10.5281/zenodo.20390327

Di Renzo, Gian Carlo, Filippo Spano, Irene Giardina, Eleonora Brillo, Graziano Clerici, and Luis Cabero Roura. "Iron deficiency anemia in pregnancy." *Women's Health* 11, no. 6 (2015): 891-900.

Miller, Jeffery L. "Iron deficiency anemia: a common and curable disease." *Cold Spring Harbor perspectives in medicine* 3, no. 7 (2013): a011866.

Gautam, Sujan, Haju Min, Heenyun Kim, and Hyoung-Sun Jeong. "Determining factors for the prevalence of anemia in women of reproductive age in Nepal: Evidence from recent national survey data." *PloS one* 14, no. 6 (2019): e0218288.

Mugheri, I. A., Ansari, I. T., Qadir, A., Shaikh, R., Saber, M., & Mugheri, A. J. (2025). Assessment of platelet count and its association with stroke severity in patients with acute ischemic stroke from larkana. *Review Journal of Neurological & Medical Sciences Review*, *3*(4), 709-714.

Freeman, Hugh James. "Iron deficiency anemia in celiac disease." *World Journal of Gastroenterology: WJG* 21, no. 31 (2015): 9233.

Tandon, Rimpy, Arihant Jain, and Pankaj Malhotra. "Management of iron deficiency anemia in pregnancy in India." *Indian Journal of Hematology and Blood Transfusion* 34, no. 2 (2018): 204-215.

Gautam, Sujan, Haju Min, Heenyun Kim, and Hyoung-Sun Jeong. "Determining factors for the prevalence of anemia in women of reproductive age in Nepal: Evidence from recent national survey data." *PloS one* 14, no. 6 (2019): e0218288.

Gautam, Sujan, Haju Min, Heenyun Kim, and Hyoung-Sun Jeong. "Determining factors for the prevalence of anemia in women of reproductive age in Nepal: Evidence from recent national survey data." *PloS one* 14, no. 6 (2019): e0218288.

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Online ISSN 3007-2387
Print ISSN 3007-2379

DOI: http://doi.org/10.5281/zenodo.20390327

Raza, Nuzhat, Iram Sarwar, Bibi Munazza, Muhammad Ayub, and Muhammad Suleman. "Assessment of iron deficiency in pregnant women by determining iron status." *Journal of Ayub Medical College Abbottabad* 23, no. 2 (2011): 36-40.

Lao, T. T., K-F. Tam, and L. Y. Chan. "Third trimester iron status and pregnancy outcome in non-anaemic women; pregnancy unfavourably affected by maternal iron excess." *Human reproduction* 15, no. 8 (2000): 1843-1848.

Barooti, Esmat, Mohammad Rezazadehkermani, Behnam Sadeghirad, Shahrzad Motaghipisheh, Soodabeh Tayeri, Minoo Arabi, Saman Salahi, and Ali-Akbar Haghdoost. "Prevalence of iron deficiency anemia among Iranian pregnant women; a systematic review and meta-analysis." *Journal of reproduction & infertility* 11, no. 1 (2010): 17.