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Midwifery care for a pregnant woman with moderate anemia

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Abstract:
Maternal Mortality Rate (MMR) and Infant Mortality Rate (IMR) remain global health problems that require improvements in the quality of maternal and neonatal health services. One approach that can be implemented to improve the quality of maternal health services is through the application of Continuity of Care (CoC) in midwifery services, which refers to continuous care provided from pregnancy, childbirth, postpartum, to family planning services. One of the common health problems during pregnancy is anemia, which can increase the risk of complications for both the mother and the baby. This study aimed to describe the implementation of midwifery care using the Continuity of Care approach in pregnant women with moderate anemia. This study used a case study method conducted at Grogol Community Health Center from October 2025 to March 2026. The subject of this study was Mrs. N, a 23-year-old pregnant woman with obstetric status G1P0000 at 33 weeks of gestation who experienced moderate anemia with a hemoglobin level of 9.0 g/dL. Data were collected through interviews, direct observation, physical examinations, and documentation studies from the Maternal and Child Health (MCH) handbook and patient medical records. Midwifery care was provided continuously, including antenatal care, labor assistance, postpartum care, newborn care, and family planning services. The results showed an increase in maternal hemoglobin levels from 9.0 g/dL to 10.9 g/dL after receiving nutritional education, iron supplementation, and consumption of beetroot as an additional nutritional source. The delivery process occurred normally, and both mother and baby were in good health. The implementation of Continuity of Care midwifery services can help improve maternal and neonatal health conditions and prevent complications during pregnancy, childbirth, and the postpartum period.

Keywords:
pregnant; midwifery care; moderate anemia

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INTRODUCTION

Maternal Mortality Rate (MMR) and Infant Mortality Rate (IMR) remain key indicators in assessing the health status of a country. These indicators not only reflect maternal and infant health conditions but also represent the quality of healthcare services, educational levels, socioeconomic conditions, and access to adequate healthcare facilities. Efforts to reduce MMR and IMR are among the main priorities within the Sustainable Development Goals (SDGs), which emphasize the

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importance of improving maternal and neonatal health in a sustainable manner. The SDGs target aims to reduce the global maternal mortality ratio to less than 70 per 100,000 live births and neonatal mortality to fewer than 12 per 1,000 live births by 2030 (World Health Organization, 2023).

Globally, maternal mortality remains high despite various interventions, particularly in developing countries. The World Health Organization reports that approximately 287,000 women die annually due to complications related to pregnancy and childbirth, most of which are preventable through timely and quality healthcare services (World Health Organization, 2023). Most maternal deaths are caused by direct complications such as hemorrhage, hypertensive disorders in pregnancy, and infections, which can be prevented through appropriate interventions and optimal maternal healthcare services (Choe et al., 2022).

In Indonesia, maternal mortality continues to be a significant public health concern. According to the Ministry of Health of the Republic of Indonesia, the MMR is approximately 305 per 100,000 live births, which remains far from the SDGs target of below 70 per 100,000 live births by 2030. In addition, the Infant Mortality Rate is still relatively high at around 16.85 per 1,000 live births. These conditions indicate that efforts to improve the quality of maternal and neonatal healthcare services must be strengthened through comprehensive and continuous healthcare approaches (Kementerian Kesehatan RI, 2023).

One approach to improving the quality of maternal healthcare services is implementing Continuity of Care (CoC) in midwifery practice. This approach emphasizes comprehensive care from pregnancy and childbirth through postpartum and family planning, with a focus on woman-centered care. Recent systematic reviews indicate that midwife-led continuity of care models can increase maternal satisfaction, reduce unnecessary medical interventions, and improve pregnancy outcomes, including reducing the risk of preterm birth (Cibralic et al., 2023; Sandall et al., 2024). Through this approach, a stronger therapeutic relationship between healthcare providers and mothers can be established, enabling early detection and optimal management of health problems.

One of the most common health problems encountered in midwifery care is anemia during pregnancy, particularly in the third trimester. During this period, iron requirements increase significantly due to fetal growth, placental development, and the expansion of maternal blood volume. The World Health Organization defines anemia in pregnancy as a hemoglobin level of less than 11 g/dL, with a global prevalence still high at approximately 36–40% (World Health Organization, 2023). This indicates that anemia remains a significant public health problem.

Physiologically, pregnancy leads to a 40–50% increase in plasma volume, resulting in hemodilution and an increased risk of anemia (Karami et al., 2022). Additionally, increased iron requirements are often not met, leading to iron deficiency anemia as the most common type among

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pregnant women (Pasricha et al., 2021). Anemia during pregnancy, especially in the third trimester, is associated with various complications such as preterm birth, low birth weight, impaired fetal growth, and an increased risk of hemorrhage during childbirth, as well as maternal and neonatal mortality (Young et al., 2023).

Beyond pregnancy and childbirth, anemia may persist into the postpartum period and affect both maternal health and infant growth and development. Studies have shown that maternal anemia is associated with postpartum anemia and impaired infant growth (Adnani et al., 2025). Therefore, comprehensive and continuous management through a Continuity of Care approach is essential to ensure early detection and optimal management from pregnancy through the postpartum (Naz et al., 2024). Management of anemia in pregnancy is not limited to iron supplementation but also involves nutritional approaches. One potential dietary source to improve hemoglobin levels is beetroot (Beta vulgaris), which contains iron, folic acid, vitamin C, and antioxidants that support erythropoiesis (Vrachnis et al., 2021). The combination of nutritional interventions and continuous midwifery care enables optimal monitoring of maternal condition and enhances the effectiveness of anemia management.

Although various interventions have been widely studied, the implementation of Continuity of Care–based midwifery care for pregnant women with moderate anemia, particularly in the third trimester, has not been reported in many comprehensive case studies. This approach is important for providing a practical illustration of continuous, holistic midwifery care in managing anemia. Therefore, this case study aims to analyze the implementation of Continuity of Care–based midwifery care in a third-trimester pregnant woman with moderate anemia. It is expected that the findings of this study will highlight the importance of comprehensive, continuous, and woman-centered care in improving maternal and neonatal health outcomes and supporting efforts to reduce maternal and infant mortality rates.

METHODS

This study employed a descriptive case study design to explore the implementation of midwifery care using the Continuity of Care (CoC) approach in a pregnant woman with moderate anemia. The study was conducted at Grogol Primary Health Center from October 2025 to March 2026. The subject of this study was Mrs. N, a 23-year-old pregnant woman with obstetric status G1P0000 at 33 weeks of gestation, who was diagnosed with moderate anemia based on hemoglobin level assessment. Data were collected through in-depth interviews, direct observation, physical examination, and documentation review from the Maternal and Child Health (MCH) handbook and

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the patient's medical records. Antenatal assessments included monitoring maternal vital signs, fetal condition, hemoglobin levels, and maternal nutritional intake patterns.

Midwifery care was provided using the Continuity of Care approach, encompassing antenatal care, delivery assistance, postpartum care, and newborn care, delivered in a comprehensive, continuous manner to ensure optimal monitoring and management of the patient's condition. The collected data were analyzed descriptively using the SOAP (Subjective, Objective, Assessment, Plan) framework to systematically describe the patient's condition and progress throughout the provision of care (Adnani et al., 2025; Hasan et al., 2022). This study also adhered to ethical principles by obtaining informed consent from the patient prior to data collection and by ensuring the patient's confidentiality and anonymity throughout the study.

RESULTS

Antenatal care for Mrs. N was provided to a 23-year-old pregnant woman with obstetric status G1P0000 who underwent monitoring during the third trimester of pregnancy. This was her first pregnancy, and throughout the observation period, no history of chronic disease that could affect the pregnancy was identified. Antenatal care was conducted through three visits, on December 23, 2025; January 4, 2026; and January 21, 2026. At each visit, assessments of maternal and fetal conditions were performed through subjective and objective examinations, establishment of midwifery diagnoses, and provision of health education.

Physical examination at the first visit showed the mother's weight was 53 kg, within the normal range for the third trimester, although regular monitoring was still required to ensure adequate weight gain. Vital signs assessment indicated a blood pressure of 110/70 mmHg, which was within normal limits and showed no indication of hypertensive disorders in pregnancy. Fundal height measurement was 29 cm, corresponding to a gestational age of approximately 33 weeks within an acceptable variation of ±2 cm. Fetal heart rate was 139 beats per minute, within the normal range of 120–160 beats per minute, indicating a good fetal condition. Laboratory examination showed a hemoglobin level of 9.0 g/dL, below the normal threshold (≥11 g/dL), supporting a diagnosis of moderate anemia. Based on subjective and objective findings, the midwifery diagnosis was G1P0000, 23 years old, 33 weeks of gestation with moderate anemia, a single live intrauterine fetus, and a Poedji Rochjati Score Card (KSPR) score of 2, indicating a low-risk pregnancy requiring routine monitoring.

The second visit was conducted on January 4, 2026, at approximately 34–35 weeks of gestation. At this visit, the mother reported no complaints. The absence of previous back pain was likely due to maternal physiological adaptation and adjustments in daily activities. The examination

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showed an increase in maternal weight to 54.3 kg, indicating appropriate fetal growth and pregnancy progression. Blood pressure was recorded at 115/70 mmHg, remaining within normal limits. Fundal height was 30 cm, consistent with gestational age. Fetal heart rate was 150 beats per minute, within the normal range, indicating a healthy fetal condition. Hemoglobin level increased to 10 g/dL, which, although still below normal, demonstrated improvement compared to the previous visit. The midwifery diagnosis remained G1P0000, 23 years old, 34–35 weeks of gestation with moderate anemia, a single live intrauterine fetus, and a KSPR score of 2.

During this visit, health education focused on the prevention and management of anemia during pregnancy. The mother was advised to increase the consumption of iron-rich foods such as green leafy vegetables, red meat, liver, eggs, and legumes. She was also encouraged to take iron supplements regularly as prescribed by healthcare providers. Iron intake was recommended to be combined with vitamin C–rich foods or beverages to enhance absorption. Additionally, the mother was advised to consume beetroot as a natural source of iron to help improve hemoglobin levels. Education was also provided regarding physiological changes in the third trimester, including increased urinary frequency, abdominal discomfort, and back pain. To maintain physical fitness, the mother was encouraged to participate in pregnancy exercise classes to improve fitness, posture, and labor preparation. A follow-up visit was scheduled within one week or sooner if any complaints arose.

The third visit was conducted on January 21, 2026, at approximately 37 weeks of gestation. At this visit, the mother reported no complaints. Examination results showed maternal weight had increased to 56.5 kg, indicating appropriate fetal growth and progression of the pregnancy. Blood pressure was 110/75 mmHg, remaining within normal limits. Fundal height was measured at 30 cm. Although no increase was observed compared to the previous visit, this finding is still considered normal near term, as fundal height growth may plateau due to fetal head engagement in the pelvic cavity. Fetal heart rate was 155 beats per minute, which remained within the normal range. Hemoglobin level increased to 10.9 g/dL, indicating further improvement in the anemia condition compared to the first visit, likely influenced by adherence to iron supplementation and improved dietary intake.

The midwifery diagnosis at this visit was G1P0000, 23 years old, 37–38 weeks of gestation with moderate anemia, a single live intrauterine fetus, and a KSPR score of 2. Health education was reinforced, emphasizing the importance of maintaining an iron-rich diet and continuing iron supplementation regularly. The mother was also educated on the signs of labor, including regular and increasing uterine contractions, bloody show, rupture of membranes, and descent of the

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presenting part. This education aimed to enable early recognition of labor signs and timely access to healthcare facilities for safe delivery.

Overall, antenatal monitoring during the third trimester showed that both maternal and fetal conditions were good. The mother's hemoglobin level gradually increased from 9.0 g/dL on December 23, 2025, to 10 g/dL on January 4, 2026, and further to 10.9 g/dL on January 21, 2026. These findings indicate that interventions, including nutritional education and iron supplementation, had a positive impact on improving anemia in pregnancy.

DISCUSSION

In the case of Mrs. N, a 23-year-old woman with obstetric status G1P0000 at 33 weeks of gestation, midwifery care was provided using a Continuity of Care (CoC) approach, which emphasizes comprehensive and continuous care from pregnancy through childbirth and the postpartum period to newborn care. Routine and comprehensive assessments enable early detection of pregnancy complications and timely interventions, thereby reducing the risk of maternal and neonatal morbidity (Kuhnt & Vollmer, 2021). This approach has been shown to improve the quality of maternal and neonatal services by fostering sustained therapeutic relationships between healthcare providers and patients (World Health Organization, 2022; Sandall et al., 2024). Furthermore, midwife-led continuity of care models have been reported to reduce unnecessary medical interventions and improve maternal satisfaction during pregnancy and childbirth (Sandall et al., 2024).

In this case, the initial hemoglobin level of 9.0 g/dL indicated moderate anemia, which has the potential to cause various complications for both the mother and the fetus. Clinically, anemia at this level may reduce oxygen-carrying capacity, increasing the risk of tissue hypoxia, maternal fatigue, and impaired fetal growth. Previous studies have demonstrated that anemia during pregnancy is associated with an increased risk of preterm birth, low birth weight, and neonatal morbidity (Figueiredo et al., 2021; Rahman et al., 2020). However, following comprehensive interventions, the hemoglobin level increased to 10.9 g/dL, indicating a significant improvement in hematological status.

Compared to the literature, the increase in hemoglobin levels observed in this case was relatively rapid. Several studies report that hemoglobin improvement in pregnant women receiving iron supplementation typically requires a longer duration, particularly in cases of low adherence (Titaley et al., 2021; Gebremedhin et al., 2022). Therefore, the findings in this case suggest the presence of additional supporting factors that contributed to the accelerated therapeutic response.

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One of the main contributing factors was the patient's adherence to iron supplementation. This adherence was likely influenced by the continuity of care approach, which fosters a strong therapeutic relationship between healthcare providers and patients. Repeated, continuous education has been shown to improve maternal knowledge and awareness of the importance of treatment, thereby enhancing adherence (Nguyen et al., 2022). Thus, the success of therapy is determined not only by the type of intervention but also by the quality of communication and education provided.

In addition, non-pharmacological interventions, such as beetroot consumption, may have contributed to the improvement in hemoglobin levels. Beetroot contains iron, folic acid, and nitrates that may enhance oxygen utilization in the body. Although this intervention cannot replace iron supplementation as the primary treatment, its combination may produce a synergistic effect in increasing hemoglobin levels (Clifford et al., 2021; Hamulka et al., 2020). This finding highlights the importance of a holistic approach that integrates medical and nutritional interventions for optimal outcomes.

From a physiological perspective, anemia in the third trimester may also be influenced by hemodilution, a condition characterized by a greater increase in plasma volume compared to red blood cell mass. This is a normal adaptation during pregnancy that often results in a relative decrease in hemoglobin levels. However, the observed increase in hemoglobin following intervention in this case suggests that iron deficiency played a more dominant role than physiological factors alone (Milman, 2021; Chaparro & Suchdev, 2019). Therefore, the interventions provided were appropriate and targeted.

Fetal monitoring throughout the care process showed favorable outcomes, as indicated by normal fetal heart rate and appropriate growth for gestational age. This suggests that moderate anemia, when properly managed, does not necessarily result in adverse fetal outcomes. Previous studies have also reported that adequate anemia management can reduce the risk of intrauterine growth restriction and neonatal complications (Daru et al., 2021; Alan et al., 2020). Therefore, it is important to emphasize that outcomes are influenced not only by the severity of anemia but also by the quality of its management.

The relatively stable fundal height observed toward the end of pregnancy in this case can be explained as part of the physiological process preceding labor, specifically fetal head engagement (lightening). This condition is often misinterpreted as impaired fetal growth, whereas it indicates preparation for labor. Obstetric literature explains that this phenomenon is common in term pregnancies and does not necessarily indicate abnormality (Cunningham et al., 2022).

The main strength of this case lies in the integration of the continuity of care approach with consistently applied pharmacological and non-pharmacological interventions. This approach

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enables comprehensive monitoring of maternal condition, improves adherence to treatment, and facilitates early detection of any changes. Additionally, continuity of care models have been shown to enhance service quality and patient experience in maternity care (Benova et al., 2018).

Despite the favorable outcomes, several limitations should be acknowledged. The assessment of anemia in this case was based solely on hemoglobin levels without measurement of serum ferritin, which limits the ability to accurately assess iron stores. Ferritin is a more sensitive indicator for detecting iron deficiency (Camaschella, 2021). Furthermore, the frequency of antenatal care visits did not fully meet recommended standards, potentially limiting optimal pregnancy monitoring. Previous studies indicate that adequate antenatal care visits are associated with reduced maternal complications (Carroli et al., 2021).

Overall, this case demonstrates that managing anemia in the third trimester of pregnancy through a continuity-of-care approach, combined with iron supplementation, nutritional education, and additional food-based interventions, can yield effective outcomes. The clinical implications of this finding highlight the importance of strengthening midwives' role in providing comprehensive, continuous, and evidence-based care, particularly in improving maternal adherence and the effectiveness of anemia management during pregnancy.

CONCLUSION

Based on the implementation of midwifery care using the Continuity of Care (CoC) approach for Mrs. N, the care provided was optimal, comprehensive, and aligned with the principles of holistic midwifery management. The care was delivered continuously, covering pregnancy, childbirth, the postpartum period, and family planning services. The evaluation results demonstrated improvements in both maternal and newborn health conditions. These findings indicate that implementing the Continuity of Care approach in midwifery services can improve maternal and neonatal health outcomes and promote family independence in maintaining reproductive health.

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CONFLICT OF INTEREST

The authors declare that the research and publication of this article were conducted in the absence of any financial or personal conflicts of interest related to this study.

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