

Comprehensive Midwifery Care for Pregnant Women with Chronic Energy Deficiency

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A B S T R A C T

Background: Anemia, preterm birth, and low birth weight are elevated risks for pregnant women with Chronic Energy Deficiency (CED), a nutritional issue. Long-term poor nutritional intake leads to CED, a condition influenced by dietary habits, socioeconomic status, and the mother's level of understanding. A pregnant woman (Mrs. "R", G5P3A1) with a Mid-Upper Arm Circumference (MUAC) of 22.5 cm was identified as being at risk for CED during a preliminary study at the Mawasangka Tengah Community Health Center (Puskesmas). **Objective:** To provide comprehensive midwifery care to Mrs. "R" (G5P3A1), who was experiencing CED, at the Mawasangka Tengah Community Health Center. Subject: Mrs. "R" (G5P3A1), a pregnant woman with CED and a MUAC of 22.5 cm. **Methods:** This final project report employs a case study methodology with a descriptive-observational approach. Care was administered using Varney's seven-step midwifery management model, and documentation followed the SOAP method. Data collection involved interviews, observation, physical examinations, and document review. **Results:** Mrs. "R" exhibited physical weakness, an unbalanced diet, and CED (MUAC <23.5 cm). The care provided included nutritional education, nutritional status monitoring, iron-folic acid supplementation, and the provision of supplementary food (purple sweet potato). Following continuous care, the mother's knowledge increased, her dietary habits changed, and her health condition improved. **Conclusion:** Continuous midwifery care can assist pregnant women with CED in improving their nutritional status and preventing complications for both the mother and the fetus.

INTRODUCTION

Pregnancy is a physiological process that alters the mother's body in various ways, thereby increasing the need for nutrients and energy to support fetal growth and development as well as maternal health. Pregnant women may experience Chronic Energy Deficiency (CED) if these nutritional needs are not adequately met over an extended period. This condition can result from insufficient food intake, an unbalanced diet, and other factors. CED in pregnant women requires serious attention due to its impact on maternal and fetal health, such as an increased risk of anemia, impaired fetal growth, preterm birth, and low birth weight. Therefore, meeting energy and nutritional needs during pregnancy is crucial for preventing CED and ensuring a healthy pregnancy (Ekawati et al., 2022).

The nutritional status of pregnant women must be monitored regularly to prevent and manage Chronic Energy Deficiency (CED). Through examinations conducted during pregnancy, antenatal care (ANC) services play a crucial role in identifying the risk of CED. Regular monitoring enables healthcare providers to detect dietary issues and implement appropriate interventions. Consequently, high-quality ANC services can help prevent and control CED while simultaneously reducing health risks for both the mother and the fetus (Sandi et al., 2023).

Chronic Energy Deficiency (CED) in pregnant women is caused by a variety of closely interrelated factors. One factor that can influence the occurrence of CED is maternal age. Pregnancy at a very young age (under 20 years) or an advanced age (over 35 years) can increase the risk of nutritional issues during pregnancy. For women under the age of 20, adequate nutritional intake is essential for both the mother's continued physical development and the growth and development of the fetus. If these needs are not sufficiently met, the mother may experience nutrient deficiencies, potentially leading to a decline in nutritional status and the onset of CED (Ummah & Utami, 2024).

Nutritional status during pregnancy is significantly influenced by a mother's eating habits and nutritional awareness. Pregnant women with limited understanding of nutrition tend to adopt unhealthy eating habits, such as a lack of dietary diversity, disregard for nutritional content, and irregular meal schedules. These conditions can lead to inadequate energy and nutrient intake during

pregnancy. Insufficient food intake may increase the risk of Chronic Energy Deficiency (CED) if it persists over an extended period. Mid-Upper Arm Circumference (MUAC) measurement is one method used to assess nutritional status and detect CED (Ningsih I et al., 2022).

Pregnant women, particularly those at risk of Chronic Energy Deficiency (CED), can improve their nutritional status by utilizing local food sources. Local foods are generally affordable, easily accessible, and rich in nutrients that help meet the nutritional needs of pregnant women. Purple sweet potato (*Ipomoea batatas* L.) is one such local food that can be utilized as a supplementary food. Purple sweet potatoes contain carbohydrates (as an energy source), fiber, vitamins, minerals, and antioxidant compounds known as anthocyanins. Given this nutritional profile, purple sweet potato serves as a promising alternative supplementary food to help meet the nutritional needs of pregnant women at risk of CED (Anita et al., 2025).

Pregnant women suffering from Chronic Energy Deficiency (CED) face a range of interconnected issues. Factors associated with the occurrence of CED include low dietary intake, high parity, short birth intervals, and irregular prenatal check-ups at health facilities (Humairoh et al., 2023); (Febriyana et al., 2024); (Nirwan et al., 2025). Short birth intervals can limit the time available for the mother's body to recover and replenish nutrient stores following a previous pregnancy, childbirth, and breastfeeding period. Therefore, comprehensive measures are required to prevent and address CED, including nutrition education, routine monitoring of nutritional status, and the provision of nutritional therapy specifically designed to meet the needs of pregnant women (Feprina et al., 2024).

The Supplementary Feeding Program (PMT) aims to improve the nutritional status of pregnant women experiencing nutritional issues. A mother's energy and nutritional needs during pregnancy can be met through the regular provision of supplementary food. Research indicates that PMT helps pregnant women gain weight and improve their nutritional status, particularly by increasing Mid-Upper Arm Circumference (MUAC) measurements (Novianti et al., 2022); (Tirtasari et al., 2025). Utilizing local foods in PMT programs is a viable alternative, as these ingredients are more readily available, affordable, and adaptable to local dietary habits. Pregnant women's nutritional status has been shown to improve when local foods are used for supplementation (Aryani et al., 2025). PMT implementation should be accompanied by nutrition education and counseling to raise awareness and encourage dietary changes among pregnant women, thereby maximizing the intervention's outcomes (Fitriani et al., 2025); (Khotimah & Sacharum, 2025).

Pregnant women suffering from Chronic Energy Deficiency (CED) can benefit from the use of purple sweet potato a local food source as a nutritional supplement. Its rich nutritional content can help meet the mother's energy and nutrient requirements during pregnancy. Research (Nurul Amalina, 2022) has shown that administering processed purple sweet potato products as a supplement improves the body weight and nutritional status of pregnant women. Furthermore, health education aimed at raising public awareness about utilizing local, nutrient-dense foods can encourage the consumption of purple sweet potatoes (Herwandar, 2026). To foster dietary changes and maintain maternal nutritional status during pregnancy, healthcare workers need to provide continuous support and nutritional education alongside nutritional supplementation (Purnama Sari et al., 2024). In light of this, the author plans to conduct a case study on comprehensive midwifery care for "Mrs. R," a pregnant patient with Chronic Energy Deficiency (CED), within the service area of the Mawasangka Tengah Community Health Center (Puskesmas).

METHODOLOGY

This final project report employs a descriptive-observational method with a case study approach to evaluate the midwifery care provided to a pregnant woman suffering from Chronic Energy Deficiency (CED). The case study method was utilized to gain a comprehensive understanding of the subject's condition and the care administered. The subject of this case study is Mrs. "R," a pregnant woman (G5P3A1) experiencing CED within the working area of the Mawasangka Tengah Community Health Center (Puskesmas). The implementation of midwifery care, provision of support, and data collection were conducted over a two-month period, from December 2025 to January 2026.

Information was obtained from both primary and secondary sources to generate reliable and comprehensive statistics. Physical examinations, observations, and interviews (anamnesis) were used to collect primary data. Information regarding chief complaints, menstrual history, obstetric history, delivery history, daily dietary habits, physical activity, and family socio-economic status was gathered through interviews. The subjects' conditions and daily activities were the primary focus of observation.

Comprehensive physical examinations included inspection, palpation, auscultation of the fetal heart rate, Leopold maneuvers (I through IV), and anthropometric measurements—specifically height, weight, and Mid-Upper Arm Circumference (MUAC). Meanwhile, secondary data were collected by reviewing various records, including laboratory results from Community Health Centers (Puskesmas), medical records, and Maternal and Child Health (MCH) booklets.

Helen Varney's seven-step midwifery management strategy was employed to conduct a descriptive analysis of the collected data. This procedure encompasses the collection of baseline data, data analysis to determine diagnoses and problems, identification of potential diagnoses or issues, assessment of the need for immediate action or team collaboration, formulation of a care plan, implementation of interventions, and evaluation of care outcomes. To ensure continuity of care, the client's condition was systematically documented at each visit using the SOAP (Subjective, Objective, Assessment, Plan) approach. This case study was conducted in accordance with ethical guidelines, including obtaining informed consent, protecting the client's privacy and anonymity, and using the information solely for scientific research purposes.

RESULTS & DISCUSSION

Subjective Data

Mrs. "R," a 30-year-old woman at 24 weeks and 5 days of gestation with an obstetric history of G5P3A1, underwent an initial examination at the Mawasangka Tengah Community Health Center. During the assessment, the client complained of weakness, lethargy, and easy fatigability when performing daily activities. She also reported a decrease in appetite over the past three weeks. The client's dietary pattern was irregular and failed to meet nutritional requirements for pregnancy; based on the interview and a 24-hour food recall, she consumed only two small main meals per day.

The patient reported rarely consuming high-protein foods whether plant- or animal-based, such as fish, meat, eggs, tofu, tempeh, and legumes due to dietary habits and financial constraints. She also admitted to frequently failing to take the iron (Fe) tablets prescribed during previous antenatal care (ANC) visits. Assessment results revealed a dietary pattern of fewer than three meals a day, irregular iron supplement intake, and a lack of dietary diversity. These factors can lead to inadequate caloric and nutritional intake during pregnancy, potentially adversely affecting the mother's health.

Based on the evaluation, the midwife explained to the client the importance of a balanced diet during pregnancy to maintain maternal health and support fetal growth and development. The client received advice on maintaining a varied diet, including the consumption of local foods rich in protein and energy. Additionally, the discussion covered the importance of regularly taking iron (Fe) supplements, getting sufficient sleep, recognizing danger signs during pregnancy, and attending regular prenatal check-ups. Following the discussion, Mrs. "R" demonstrated an understanding of the information provided and expressed her willingness to follow the healthcare provider's recommendations. To improve her nutritional status, she also agreed to consume supplementary food (PMT), specifically products made from purple sweet potato.

Objective Data

Anthropometric and physical examinations were conducted to assess Mrs. R's health status. The results indicated that the client was fully conscious (*compos mentis*) and in good general health. Her body temperature (36.6°C), blood pressure (110/70 mmHg), pulse rate (82 beats/minute) and respiratory rate (20 breaths/minute) were all within normal ranges. Anthropometric measurements showed a Mid-Upper Arm Circumference (MUAC) of 22.5 cm. Mrs. R is classified as experiencing or being at risk of Chronic Energy Deficiency (CED) during pregnancy, as this measurement falls below the 23.5 cm threshold.

Mrs. "R" has a hemoglobin (Hb) level of 11 g/dL, which falls within the normal range based on laboratory test results. Leopold abdominal palpation indicates that the fetal position and condition are appropriate for the gestational age. Measurement of the fundal height (TFU) also shows fetal growth consistent with a gestational age of 24 weeks and 5 days. Auscultation of the fetal heart rate (FHR) reveals a stable rhythm at 140 beats per minute. Mrs. "R" (G5P3A1) was diagnosed with Chronic Energy Deficiency (CED) at a gestational age of 24 weeks and 5 days, based on both subjective and objective data. Subsequently, Varney's seven-step midwifery management approach was applied in providing midwifery care, and the SOAP format was used for documentation.

Analysis

Data analysis indicates that Mrs. "R" needs to improve her nutritional status through continuous midwifery care and nutritional therapy to prevent serious pregnancy complications. A

schedule of three home visits has been arranged to provide care and monitor the mother's health. Each visit involves evaluating the mother's condition, monitoring her weight, measuring the Mid-Upper Arm Circumference (MUAC), checking adherence to iron (Fe) supplement intake, and monitoring the fetal heart rate (FHR). To improve nutritional status and support fetal growth, the mother is also provided with education and encouraged to increase her meal frequency to three times a day, consume healthy snacks, and adopt a diverse and balanced diet.

To help women meet their energy needs, a local food-based supplementary feeding program utilizing purple sweet potato products was implemented. Mothers received education on the health benefits of purple sweet potatoes and how to prepare them as healthy snacks. The purpose of this supplement was to complement main meals rather than replace them. Husbands and family members were also included in the educational and nutritional interventions to encourage mothers to take daily iron (Fe) supplements and to reduce the stress associated with household chores, thereby ensuring they had sufficient time to rest.

Evaluations showed that Mrs. "R's" condition improved following the series of visits. She reported reduced weakness and fatigue, improved appetite, and a more diverse diet. Her Mid-Upper Arm Circumference (MUAC) increased from 22.5 cm to 23.0 cm by the second visit and to 23.5 cm by the third, indicating an objective improvement in nutritional status. Her body weight rose from 51 kg to 53 kg an increase of 2 kg. Additionally, the fetal heart rate remained within the normal range, indicating a healthy fetus. These results demonstrate that the nutritional status of pregnant women suffering from Chronic Energy Deficiency (CED) can be improved through continuous midwifery care and the provision of locally sourced supplementary foods, specifically purple sweet potatoes.

Management

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The client was informed about the necessity of taking iron supplements regularly to meet iron requirements during pregnancy and prevent anemia. She was also advised to undergo regular prenatal check-ups to monitor her health and fetal development, as well as to recognize danger signs associated with pregnancy. To improve the mothers' nutritional status, purple sweet potatoes were provided as a supplementary food. The mothers were informed that purple sweet potatoes are a local food source capable of helping to increase energy and nutrient intake. To meet nutritional needs during pregnancy, they were also encouraged to maintain a balanced diet that includes main meals as well as various supplementary foods.

Mrs. "R's" condition improved after three monitoring visits. Her Mid-Upper Arm Circumference (MUAC) increased from 22.5 cm to 23.5 cm, her body weight rose by 1.5 kg, her appetite improved, and her fatigue subsided; all these indicators point to an improvement in her nutritional and health status. Mrs. "R" received continuous midwifery care to address her Chronic Energy Deficiency (CED), which included nutritional education, monitoring of nutritional status, recommendations to take iron (Fe) supplements, and the provision of supplementary food in the form of purple sweet potatoes.

DISCUSSION

Subjective Data

Mrs. "R" (G5P3A1) reported feeling extremely fatigued at 24 weeks and 5 days of gestation due to an irregular eating pattern (consuming only two meals a day) and inadequate protein intake. This condition can hinder the fulfillment of nutritional and energy requirements during pregnancy. She also does not take iron (Fe) supplements regularly. The Chronic Energy Deficiency (CED) experienced by Mrs. "R" is further exacerbated by her reluctance to attend routine prenatal check-ups and her lack of knowledge regarding proper nutrition.

A mother's educational background and nutritional knowledge can influence her dietary habits. Mothers who lack the knowledge to make appropriate food choices may consume foods that fail to meet their nutritional needs during pregnancy. Research (Ningsih I et al., 2022), indicates a link

between the dietary habits and knowledge levels of pregnant women and the prevalence of Chronic Energy Deficiency (CED). To determine the appropriate course of action, midwifery care should begin with an assessment of the mother's dietary habits and understanding.

The evaluation also indicates that the mother frequently failed to take iron (Fe) supplements, in addition to issues regarding dietary intake. A mother's nutritional and health status during pregnancy can be compromised by non-compliance with iron supplementation. Furthermore, infrequent antenatal care (ANC) visits and low adherence to health recommendations can serve as risk factors for Chronic Energy Deficiency (CED). This aligns with research by (Febriyana et al., 2024), which highlights the importance of support during pregnancy in improving maternal adherence to iron supplementation.

Based on her reproductive history, Mrs. "R" has a status of G5P3A1 and is currently pregnant. Due to increased nutritional demands during pregnancy, high parity and repeated pregnancies can deplete maternal nutrient reserves. According to (Humairoh et al., 2023), parity and birth spacing are factors associated with the incidence of Chronic Energy Deficiency (CED) in pregnant women. A comprehensive evaluation of subjective data is necessary to improve the mother's nutritional status and formulate a care plan.

Objective Data

Based on the objective examination results, Mother "R's" Mid-Upper Arm Circumference (MUAC) was 22.5 cm, a figure below the standard threshold of 23.5 cm. The risk of Chronic Energy Deficiency (CED) in pregnant women is assessed using MUAC measurements—an anthropometric indicator where a measurement of less than 23.5 cm indicates a risk of CED. This aligns with findings by (Nurliawati & Hersoni, 2024), which state that monitoring body weight and measuring MUAC are crucial for identifying nutritional issues in pregnant women.

The client appeared physically weak and fatigued, and her weight gain during pregnancy was outside the normal range. Laboratory results showed a hemoglobin (Hb) level of 11 g/dL, while her vital signs were within normal limits. The fetal condition appeared favorable, with a fetal heart rate (FHR) of 140 beats per minute and adequate uterine growth. This indicates that, although the mother is experiencing Chronic Energy Deficiency (CED), there are no signs of acute distress; therefore, management focuses on improving her nutritional status.

The SOAP approach is used to assess and document changes in the mother's status over time. During each antenatal visit, nutritional status specifically body weight and Mid-Upper Arm Circumference (MUAC) is monitored to determine the effectiveness of the intervention. Assessing the mother's response to nutritional interventions and supplementation requires continuous monitoring of objective data (Harna et al., 2024).

Analysis

The obstetric diagnosis for Mrs. "R" (G5P3A1) is Chronic Energy Deficiency (CED) at a gestational age of 24 weeks and 5 days, based on subjective and objective evidence. Inadequate dietary intake, an unbalanced diet, and non-adherence to iron (Fe) supplementation are associated with this condition. Low birth weight (LBW), anemia, and preterm birth are risks associated with untreated CED. However, examination findings indicate that the current condition of both the mother and fetus is stable; therefore, the therapeutic focus is on improving the mother's nutritional status.

Therefore, a key priority in the care of pregnant women is improving nutritional status through coordinated and sustained nutritional therapy. In addition to increasing caloric intake to meet the mother's needs during pregnancy, this care includes nutritional education aimed at enhancing knowledge and improving dietary habits. (Feprina et al., 2024), state that monitoring nutritional status, providing supplementation, and administering nutritional therapy in a measured and sustained manner are essential in managing pregnant women with Chronic Energy Deficiency (CED).

Management

Educating the mother about a balanced diet using simple language is the initial step in the management process. To ensure dietary diversity, she is advised to increase her intake of fruits and vegetables, as well as sources of both animal and plant-based protein. According to (Fitriani et al., 2025), nutritional education during pregnancy can enhance a mother's knowledge and awareness regarding the maintenance of her health. She also receives counseling on the importance of getting adequate sleep and taking iron (Fe) supplements regularly. According to (Khotimah & Sacharum, 2025), ongoing nutritional counseling can improve maternal adherence to a healthy diet and supplement use.

Processed purple sweet potato (*Ipomoea batatas L.*) products are utilized in local food-based Supplementary Feeding Programs (PMT) as an intervention to help improve maternal nutritional status. Purple sweet potatoes were selected due to their accessibility and affordability, as well as their rich content of fiber, carbohydrates, vitamins, and antioxidants. Local food-based PMT can help improve the nutritional condition of pregnant women suffering from Chronic Energy Deficiency (CED) leading to increases in body weight and Mid-Upper Arm Circumference (MUAC) as demonstrated in studies by (Aryani et al., 2025) and (Novianti et al., 2022). Furthermore, research by (Nurul Amalina, 2022) and (Herwandar, 2026) indicates that providing purple sweet potato products to pregnant women with CED can increase their body weight.

Evaluation

At the initial visit, Mrs. "R" had a mid-upper arm circumference (MUAC) of 22.5 cm and a body weight of 51 kg. She complained of a lack of appetite and easy fatigability. At the second visit, her weight had increased to 51.8 kg and her MUAC to 23 cm; complaints of fatigue had decreased, and her appetite was beginning to improve. At the third visit, her MUAC reached 23.5 cm and her weight increased to 53 kg. Her appetite continued to improve, and she no longer complained of fatigue. Throughout the series of visits, the fetal heart rate remained within normal limits.

Monitoring results indicate positive changes during the treatment period. Body weight increased by 2 kg, and mid-upper arm circumference (MUAC) increased by 1 cm. These changes suggest an improvement in nutritional status during the observation period. These findings align with research on Supplementary Feeding (PMT), which demonstrates that supplementary food interventions lead to weight gain in pregnant women with Chronic Energy Deficiency (CED) (Tirtasari et al., 2025). Regular monitoring of nutritional status is also crucial for tracking changes in the mother's condition during therapy (Harna et al., 2024).



Gambar 1. Pemeriksaan Awal



Gambar 2. Pengukuran LILA

CONCLUSION

Based on the midwifery care provided to Mrs. "R" (G5P3A1) at the Mawasangka Tengah Community Health Center, several factors were found to influence her condition of Chronic Energy Deficiency (CED). These factors include inconsistent and unbalanced dietary patterns, as well as a lack of knowledge regarding how to meet nutritional needs during pregnancy. Addressing CED also requires consideration of the mother's reproductive history. Comprehensive midwifery care is necessary to help improve the mother's nutritional status.

The nutritional status of pregnant women can deteriorate if they do not regularly take iron (Fe) supplements. When managing care, factors contributing to non-compliance—such as frequently forgetting to take the supplements—must be taken into account. A mother's nutritional reserves can also be affected by a history of high parity and multiple pregnancies. Therefore, family support and ongoing health education are crucial for encouraging adherence to supplementation and improving dietary habits during pregnancy (Taye et al., 2025).

To evaluate the mother's nutritional status, anthropometric measurements were taken at a gestational age of 24 weeks and 5 days. The results showed a Mid-Upper Arm Circumference (MUAC) of 22.5 cm; this figure falls below the 23.5 cm threshold, indicating a risk of Chronic Energy Deficiency (CED). Measuring MUAC is a simple method for assessing the risk of CED in pregnant

women. Given that CED can increase the risk of anemia, preterm birth, and low birth weight (LBW), early diagnosis through MUAC screening is crucial (Rachmi et al., 2024).

Varney's seven-step midwifery management strategy and SOAP documentation are employed to comprehensively address dietary issues in pregnant women. These methods facilitate problem identification, the formulation of action plans, and regular monitoring of maternal health. Interventions include weight monitoring, counseling on supplement adherence, and education regarding a balanced diet. Through this care, it is expected that expectant mothers will gain greater knowledge and adopt a healthy lifestyle during pregnancy.

In the Supplementary Feeding Program (PMT), purple sweet potato (*Ipomoea batatas* L.) is utilized as a local food source to improve the nutritional status of pregnant women. Purple sweet potatoes contain anthocyanins which act as antioxidants as well as fiber to aid digestion and carbohydrates as an energy source. They are readily available, highly nutritious, and versatile enough to be prepared into a variety of dishes. Utilizing this local food source offers a sustainable and affordable option for supplementary nutrition.

Over the course of three monitoring visits, the mother's nutritional status improved. By the final visit, her Mid-Upper Arm Circumference (MUAC) had gradually increased from 22.5 cm to 23.5 cm. She also experienced a weight gain of 2 kg, an increase in appetite, and a reduction in complaints of easy fatigue. These findings indicate that the mother's health and nutritional status improved following continuous midwifery care.

LIMITATIONS

As Mrs. "R" is the sole subject of this case study, the findings cannot be generalized to other pregnant women suffering from Chronic Energy Deficiency (CED). Furthermore, the long-term impact of the intervention could not be evaluated due to the very brief monitoring period. Given that the intervention was comprehensive incorporating nutritional education, iron (Fe) supplementation, and routine monitoring of the mother's condition—the observed increases in body weight and Mid-Upper Arm Circumference (MUAC) cannot be attributed exclusively to the consumption of purple sweet potatoes.

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