

THE ROLE OF NUTRITIONAL EDUCATION DURING ANTENATAL VISITS IN REDUCING THE RISK OF CHRONIC ENERGY DEFICIENCY (CED) IN PREGNANT WOMEN

Syarifah Khatijah¹, Andriya Syahriatul Masrifah², Aldi Febrian Wimienati³

^{1,2,3} Midwifery Study Program, STIKes Bhakti Al-Qodiri, Jember, Indonesia
Email correspondence: syarifahkhatijah1363@gmail.com

ABSTRAK : PERAN EDUKASI NUTRISI DALAM KUNJUNGAN ANTENATAL TERHADAP PENURUNAN RISIKO KEKURANGAN ENERGI KRONIK (KEK) PADA IBU HAMIL

Latar Belakang: Kekurangan Energi Kronik (KEK) pada ibu hamil masih menjadi masalah kesehatan yang dapat berdampak pada ibu dan janin. Edukasi nutrisi dalam kunjungan antenatal merupakan salah satu upaya untuk meningkatkan pemenuhan kebutuhan gizi ibu hamil. Tujuan: Penelitian ini bertujuan untuk menganalisis efektivitas edukasi nutrisi dalam menurunkan risiko KEK pada ibu hamil. Metode: Penelitian ini menggunakan metode *pre-eksperimen* dengan *one group pretest-posttest design*. Populasi adalah ibu hamil yang melakukan kunjungan antenatal di fasilitas kesehatan, dengan jumlah sampel 41 responden menggunakan teknik purposive sampling. Analisis data menggunakan uji *Wilcoxon sign rank test*. Hasil: Hasil analisis menggunakan uji Mc nemmar menunjukkan nilai *p-value* 0,046 ($p < \alpha = 0,05$), yang berarti signifikan. Kesimpulan: Edukasi nutrisi terbukti efektif dalam menurunkan risiko KEK pada ibu hamil. Saran: edukasi nutrisi perlu dilakukan secara rutin dan berkelanjutan pada setiap kunjungan antenatal untuk meningkatkan kesehatan ibu dan janin.

Kata Kunci: Antenatal, Edukasi nutrisi, Ibu hamil, Kekurangan energi kronik (KEK)

ABSTRACT

Background: Chronic Energy Deficiency (CED) in pregnant women remains a health problem that can impact both the mother and the fetus. Nutritional education during antenatal visits is one of the efforts to improve the fulfillment of pregnant women's nutritional needs. Objective: This study aimed to analyze the effectiveness of nutritional education in reducing the risk of CED in pregnant women. Methods: This study used a pre-experimental method with a one-group pretest-posttest design. The population consisted of pregnant women attending antenatal care at health facilities, with a sample size of 41 respondents selected using purposive sampling technique. Data were analyzed using the Wilcoxon signed-rank test. Results: The analysis using the McNemar test showed a *p-value* of 0.046 ($p < \alpha = 0.05$), indicating a significant result. Conclusion: Nutritional education has been proven effective in reducing the risk of CED in pregnant women. Suggestion: Nutritional education should be provided routinely and continuously at every antenatal visit to improve maternal and fetal health.

Keywords: Antenatal, Nutritional Education, Pregnant Women, Chronic Energy Deficiency (CED)

INTRODUCTION

Chronic Energy Deficiency (CED) in pregnant women remains a serious health problem as it affects both maternal and fetal conditions (Susanti & Aisyah, 2024). This condition is often influenced by a lack of maternal knowledge regarding nutritional needs during pregnancy (Diningsih et al., 2021; Retni et al., 2021). In addition, the utilization of healthcare services such as antenatal visits has not been fully optimized as a means of nutritional education. If not properly addressed, CED can increase the risk of complications during pregnancy and childbirth (Wulandari & Sumanti, 2022).

Globally, the World Health Organization (WHO) reports that around 40% of pregnant women experience anemia, most of which is associated with energy and nutrient deficiencies, contributing to high maternal morbidity and mortality rates (Fatkhiyah et al., 2022). In Indonesia, based on data from the Ministry of Health through Riskesdas and nutrition reports, the prevalence of pregnant women with CED has ranged from the mid-teens to nearly 20% in recent years (Afiansa et al., 2025). In East Java Province, the prevalence of CED among pregnant women is reported to be around 19,6%, which remains a public health concern (Dewi et al., 2023). Meanwhile, in Jember Regency, local health

office data indicate that cases of CED among pregnant women are still found, with a prevalence of approximately 13,8%. This indicates that CED remains a challenge in improving maternal and child health (Zein et al., 2025).

CED in pregnant women occurs due to a prolonged imbalance between energy intake increased nutritional needs during pregnancy, which may be worsened by factors such as poor pre-pregnancy nutritional status, nausea irregular eating patterns (Kadmaerubun et al., 2023; Sari & Sapitri, 2021). This condition can negatively affect both mother and fetus, leading to anemia, fatigue, childbirth complications, low birth weight, growth retardation, increased neonatal mortality, and long-term health problems, making prevention an important priority in maternal healthcare services (Ariani et al., 2024; Fibrila et al., 2022).

Efforts to prevent CED can be carried out through improving balanced nutritional intake and routine monitoring of maternal health. One effective strategy is nutritional education during antenatal visits (Jusnawati et al., 2025; Marpiani et al., 2025). Antenatal care provides an important opportunity for healthcare providers to deliver information and counseling regarding nutritional needs during pregnancy (Suhadah et al., 2023). Proper education can enhance mothers' knowledge and awareness in meeting their nutritional needs. Thus, the risk of CED can be minimized (Juliastuti & Suaib, 2024a; Yusefni & Susanti, 2025).

Based on the above description, it is important to conduct research on the effectiveness of nutritional education during antenatal visits in preventing CED among pregnant women. This study aims to determine the extent to which nutritional education can improve maternal understanding and prevent the occurrence of CED. The results are expected to serve as a basis for developing more effective intervention programs in antenatal care. In addition, this study aims to analyze the effectiveness of nutritional education during antenatal visits in preventing chronic energy deficiency (CED) among pregnant women.

RESEARCH METHODS

This study used a pre-experimental design with a one group pretest-posttest design. The research was conducted at TPMB Halimah, Puger District, Jember Regency, in April 2024. The population consisted of all pregnant women who

visited TPMB Halimah in April, totaling 46 individuals, with a sample size of 41 respondents determined using purposive sampling technique. The inclusion criteria were: (1) willing to participate as respondents; (2) pregnant women who were able to communicate well (able to read and understand the questionnaire); and (3) pregnant women residing in the TPMB Halimah area, Puger District, Jember Regency. The exclusion criteria were: (1) pregnant women with severe complications (such as severe preeclampsia or other chronic diseases) that could directly affect nutritional status; (2) pregnant women who did not complete the full series of nutritional education; and (3) pregnant women who were absent during data collection or dropped out during the study.

The instruments used in this study included an informed consent form, observation sheet, Mid-Upper Arm Circumference (MUAC) measuring tape, and Standard Operating Procedures (SOP) for providing education related to nutritional fulfillment during pregnancy. The education was delivered once with a duration of 30 minutes (B. D. S. Septiani & Sulistiawati, 2022). The pretest (MUAC measurement) was conducted on the first day, and the posttest was conducted on the 14th day after the intervention (Hidamansyah et al., 2025). Data analysis was performed using the Wilcoxon signed-rank test.

RESEARCH RESULTS

The results of the univariate analysis, which include respondent characteristics such as age, education, occupation, parity, and trimester, are presented in Table 1 below.

Table 1 presents the frequency distribution of respondents based on the characteristics of pregnant women. Based on age, the majority were 20–35 years old (31 respondents, 75.6%); based on education, most had completed senior high school (30 respondents, 73.2%); based on occupation, the majority were unemployed (35 respondents, 85.4%); based on parity, most were multigravida (30 respondents, 73.2%); and based on gestational age, the majority were in the second trimester (31 respondents, 75.6%).

The results of the analysis on the effect of nutritional education during antenatal visits on reducing the risk of Chronic Energy Deficiency (CED) in pregnant women are presented in Table 2 below.

Table 1
Frequency distribution of respondents based on the characteristics of pregnant women (n=41)

Characteristics	f	%
Age		
<20 years	3	7.3
20-35 years	31	75.6
>35 years	7	17.1
Education		
Junior High School	8	19.5
Senior High School	30	73.2
Higher Education (Diploma, Bachelor, etc)	3	7.3
Occupation		
Employed	6	14.6
Unemployed	35	85.4
Parity		
Primigravida	11	26.8
Multigravida	30	73.2
Trimester		
First Trimester	8	19.5
Second Trimester	31	75.6
Third Trimester	2	4.9

Sumber: Primary Data, 2025

Table 2
The Role of Nutritional Education during Antenatal Visits in Reducing the Risk of Chronic Energy Deficiency (CED) in Pregnant Women

CED Risk	Nutritional Education				p-value
	Before		After		
	f	%	f	%	
CED	5	12,2	1	2,4	0,046
Non CED	36	87,8	40	97,6	

Table 2 presents the results of the bivariate analysis, showing that before nutritional education during antenatal visits, 5 respondents (12.2%) experienced CED. After receiving nutritional education, only 1 respondent (2.4%) experienced CED. The results of the normality test using the Shapiro-Wilk test showed a p-value $> \alpha = 0.05$, indicating that the data were not normally distributed; therefore, data analysis was performed using the Wilcoxon signed-rank test. The results of the Wilcoxon signed-rank test showed a p-value of 0.046 ($p < \alpha = 0.05$), indicating that nutritional education during antenatal visits has a significant effect on reducing the risk of Chronic Energy Deficiency (CED) in pregnant women.

DISCUSSION

The Incidence of Chronic Energy Deficiency (CED) in Pregnant Women Before Nutritional Education During Antenatal Visits

The results of the study showed that before receiving nutritional education during antenatal

visits, 5 pregnant women (12.2%) experienced Chronic Energy Deficiency (CED). This condition was indicated by mid-upper arm circumference (MUAC) measurements of <23.5 cm, which signify a risk of CED. In addition, age was also a contributing factor, with 7.3% of pregnant women aged <20 years and 17.1% aged >35 years, both categorized as high-risk groups. Among those in the first trimester, 19.5% experienced conditions related to nausea and vomiting, which can affect reduced nutritional intake and weight loss. These findings indicate that prior to the intervention, there were still pregnant women at risk of CED due to a combination of biological and behavioral factors.

These findings indicate that before receiving nutritional education, there were still pregnant women who were vulnerable to Chronic Energy Deficiency (CED) due to various interrelated factors. Maternal age in high-risk groups (<20 years and >35 years) can affect physical readiness and nutritional needs during pregnancy, thereby increasing the likelihood of energy deficiency

(Adesty et al., 2025). In addition, conditions in the first trimester, which are commonly associated with nausea and vomiting, also contribute to decreased food intake, ultimately affecting maternal nutritional status. These results suggest that a lack of understanding of nutritional needs during pregnancy, along with physiological factors, are the main causes of CED before intervention (A. K. Dewi et al., 2021).

According to the researcher's perspective, the presence of pregnant women at risk of Chronic Energy Deficiency (CED) before receiving nutritional education indicates that their understanding and awareness of nutritional needs during pregnancy are still not optimal. This condition is influenced by high-risk maternal age, physiological changes in early pregnancy such as nausea and vomiting, and the possibility of inadequate information regarding proper dietary patterns during pregnancy. Therefore, continuous nutritional education during antenatal visits is essential to ensure that pregnant women are able to meet their nutritional needs optimally and prevent the occurrence of CED.

The Incidence of Chronic Energy Deficiency (CED) in Pregnant Women After Nutritional Education During Antenatal Visits

The results of the study showed that after receiving nutritional education during antenatal visits, only 1 pregnant woman (2.4%) experienced Chronic Energy Deficiency (CED). This finding indicates a decrease in the number of pregnant women experiencing CED from 12.2% to 2.4%. This reduction suggests that the nutritional education provided played a role in improving the nutritional status of pregnant women. Proper education can enhance mothers' knowledge and awareness in meeting their nutritional needs during pregnancy. Thus, nutritional education interventions have been proven to contribute to reducing the incidence of CED.

The decrease in CED incidence among pregnant women is also influenced by several respondent characteristics. Based on education level, most respondents had completed senior high school, totaling 30 individuals (73.2%), which may enable them to better receive and understand health information. Higher levels of education are generally associated with increased knowledge and awareness regarding the importance of nutritional fulfillment during pregnancy. This supports the success of the nutritional education intervention provided. Therefore, education is an important factor influencing behavioral changes in pregnant women (Prajayanti & Baroroh, 2023; Yunus, 2024).

In addition to education, other factors such as occupation, parity, and gestational age also contributed to the reduction in CED incidence.

Based on occupation, the majority of mothers were unemployed, totaling 35 individuals (85.4%), allowing them more time to pay attention to dietary patterns and health during pregnancy (Lestari, 2021). In terms of parity, most respondents were multigravida, totaling 30 individuals (73.2%), which may provide them with more experience in managing previous pregnancies. Furthermore, most mothers were in the second trimester, totaling 31 individuals (75.6%), a stage where nausea and vomiting tend to decrease, allowing for more optimal nutritional intake. The combination of these factors supported the effectiveness of nutritional education in reducing CED incidence (Mataram, 2022; Putri & Maulani, 2023).

According to the researcher, the decrease in CED incidence after nutritional education indicates that this intervention is effective in improving the nutritional status of pregnant women. The education provided not only increases knowledge but also encourages behavioral changes in meeting nutritional needs. In addition, supporting factors such as education level, pregnancy experience, and trimester condition further strengthen the intervention outcomes. Therefore, nutritional education during antenatal visits should be implemented routinely and continuously. This is expected to be an effective strategy in preventing CED among pregnant women.

The Effect of Nutritional Education During Antenatal Visits on Reducing the Risk of Chronic Energy Deficiency (CED) in Pregnant Women

Nutritional education plays an important role during antenatal visits in reducing the risk of Chronic Energy Deficiency (CED) in pregnant women. This is supported by the fact that before receiving nutritional education, 5 pregnant women (12.2%) experienced CED, while after the intervention, the number decreased to only 1 person (2.4%). This reduction indicates a positive change in meeting the nutritional needs of pregnant women. Thus, nutritional education has been proven effective in reducing the risk of CED.

Nutritional education for pregnant women plays an important role in increasing knowledge related to nutritional needs during pregnancy. Through the provision of accurate information regarding the type, amount, and frequency of recommended food intake, pregnant women better understand the importance of fulfilling balanced nutrition for themselves and their fetus. This increase in knowledge helps mothers recognize the risk of Chronic Energy Deficiency (CED), making them more aware of maintaining a healthy and regular dietary pattern during pregnancy (R. Septiani & Rohayani, 2025; Yandari & Apriani, 2025).

This improvement in knowledge subsequently influences changes in pregnant women's behavior in meeting their nutritional needs. Pregnant women who receive education tend to be more capable of implementing a balanced diet, increasing energy and protein intake, and paying attention to the quality of the food consumed. These behavioral changes are reflected in improved adequate nutritional intake, which can enhance maternal nutritional status and reduce the risk of CED (Afrianty et al., 2025; Retni et al., 2021).

Furthermore, increased knowledge continues to reinforce behavioral changes in pregnant women in fulfilling their nutritional requirements. Mothers who receive nutritional education are more likely to consistently apply balanced dietary practices, improve energy and protein consumption, and ensure the quality of their food intake. This leads to better nutritional adequacy, thereby improving maternal nutritional status and further reducing the risk of Chronic Energy Deficiency (CED).

CONCLUSION

Nutritional education during antenatal visits has been proven effective in reducing the risk of Chronic Energy Deficiency (CED) in pregnant women, as indicated by the decrease in incidence from 12.2% before the intervention to 2.4% after the education.

Suggestion this education plays a role in improving knowledge, attitudes, and behaviors of pregnant women in meeting their nutritional needs, thereby positively impacting maternal and fetal health. Therefore, healthcare providers are advised to deliver nutritional education routinely and systematically at every antenatal visit, pregnant women are expected to actively adopt balanced dietary patterns, healthcare facilities should support with adequate educational media, and future researchers are encouraged to examine other factors influencing CED to obtain more comprehensive findings.

SUGGESTION

The researcher would like to express sincere gratitude to STIKES Bhakti Al-Qodiri for the support and facilitation provided in conducting this research. Appreciation is also extended to the supervisors for their guidance, direction, and motivation throughout the research process until its successful completion. Their support and contributions have been invaluable to the smooth progress and success of this study.

REFERENCES

Adesty, R. E. W., Anggadita, T., Damayanti, R., & Mutika, W. T. (2025). Faktor-Faktor yang mempengaruhi Terjadinya Kekurangan

Energi Kronis pada Ibu Hamil dengan Risiko Tinggi: Factors Influencing the Occurrence of Chronic Energy Deficiency in High-Risk Pregnant Women. *Jurnal Kesmas Untika Luwuk: Public Health Journal*, 16(1), 31–39.

Afliansa, F., Sartika, R. A. D., Utari, D. M., & Suparno, S. (2025). Proportion of Chronic Energy Deficiency in Relation to Macronutrient Intake and Other Determinants Among Pregnant Women in Selected Community Health Center Service Areas in Bogor 2025. *Indonesian Journal of Public Health Nutrition (IJPHN)*, 6(1).

Afrianty, Y., Hastuty, D., Aulia, D., & Baso, A. S. R. (2025). Peningkatan Pengetahuan Ibu Hamil Melalui Edukasi Nutrisi Seimbang untuk Kesehatan Ibu dan Janin. *Mega Buana Journal of Innovation and Community Service*, 4(2), 35–43.

Ariani, S., Zalukhu, M., & Winarni, L. M. (2024). Hubungan kekurangan energi kronik dengan kejadian anemia pada ibu hamil. *JMM (Journal of Midwifery Madani)*, 1(1), 11–18.

Dewi, A. K., Dary, D., & Tampubolon, R. (2021). Status gizi dan perilaku makan ibu selama kehamilan trimester pertama. *Jurnal Epidemiologi Kesehatan Komunitas*, 135–144.

Dewi, I. M., Hapsari, E., & Wulandari, R. (2023). Hubungan Usia dan Status Pekerjaan terhadap Kejadian Kurang Energi Kronis (KEK) pada Ibu Hamil di Wilayah Kerja Puskesmas Arjosari Pacitan. Kusuma Husada Universitas Surakarta.

Diningsih, R. F., Wiratmo, P. A., & Lubis, E. (2021). Hubungan Tingkat Pengetahuan Tentang Gizi Terhadap Kejadian Kekurangan Energi Kronik (Kek) Pada Ibu Hamil. *Binawan Student Journal*, 3(3), 8–15.

Fatkhayah, N., Salamah, U., Indrastuti, A., & Nurfiati, L. (2022). Studi Korelasi Status Gizi dengan Kejadian Anemia pada Ibu Hamil. *Jurnal kesehatan komunitas (Journal of community health)*, 8(3), 569–575.

Fibrila, F., Herlina, H., Ridwan, M., & Harnanto, A. M. (2022). Faktor dominan penyebab kejadian kekurangan energi kronik pada ibu hamil. *Jurnal Medikes (Media Informasi Kesehatan)*, 9(1), 1–16.

Hidamansyah, M., Jannah, R., Kulsum, U., & Fithriani, Z. W. (2025). Pentingnya Edukasi Gizi pada Ibu Hamil yang Mengalami Kekurangan Energi Kronik (KEK) di Desa Tambaan Kec. Camplong Kab. Sampang. *Ardhi: Jurnal Pengabdian Dalam Negeri*, 3(5), 19–25.

Juliastruti, D., & Suaib, F. (2024). Peran Konseling dalam Meningkatkan Pengetahuan dan

- Asupan Gizi Ibu Hamil Kekurangan Energi Kronik (KEK): The Role of Nutritional Intake of Pregnant Women with Chronic Energy Deficiency (CHD). *Media Gizi Pangan*, 31(2), 222–231.
- Jusnawati, J., Wahda, M. A., Amandaria, R., & Alfiyah, R. (2025). Edukasi pencegahan stunting melalui pemenuhan kesejahteraan ibu hamil di Kelurahan Sitampae Kecamatan Tempe Kabupaten Wajo. *Ininnawa: Jurnal Pengabdian Masyarakat*, 3(2), 268–275.
- Kadmaerubun, H. S., Azis, R., & Genisa, J. (2023). Hubungan pola makan dan asupan gizi dengan kekurangan energi kronik (KEK) pada ibu hamil. *Inhealth: Indonesian Health Journal*, 2(2), 127–138.
- Lestari, A. (2021). Faktor risiko kurang energi kronis pada ibu hamil di Puskesmas Gunungpati. *Sport and Nutrition Journal*, 3(2), 1–13.
- Marpiani, M., Margaretha, M., Ginting, S. S. T., Sembiring, M. B., & Pasaribu, R. S. (2025). Edukasi Penangan dan Pencegahan Gizi Kurang pada Balita di Wilayah Kerja Puskesmas Rantang Kota Medan Tahun 2024. *Jurnal Pengabdian Kolaborasi dan Inovasi IPTEKS*, 3(1), 246–252.
- Mataram, S. Y. (2022). Faktor-Faktor Yang Mempengaruhi Gizi Pada Ibu Hamil. *Gizi Pada Ibu Hamil*, 67.
- Prajayanti, H., & Baroroh, I. (2023). Pengetahuan ibu hamil tentang pentingnya gizi pada masa kehamilan. *Jurnal Kesehatan Mercusuar*, 6(1), 1–7.
- Putri, D., & Maulani, N. (2023). *Asuhan Kebidanan Komprehensif Pada Ibu Hamil TM II Kekurangan Energi Kronik (Kek) Dengan Manajemen Nutrisi Di Pmb I Kota Bengkulu Tahun 2023*. Sekolah Tinggi Ilmu Kesehatan Sapta Bakti.
- Retni, A., Puluhulawa, N., & Utina, S. I. (2021). Pengaruh pengetahuan ibu hamil terhadap kejadian kekurangan energi kronik di wilayah kerja puskesmas batudaa pantai. *Zaitun (Jurnal Ilmu Kesehatan)*, 9(1), 952–964.
- Sari, I., & Sapitri, A. (2021). Pemeriksaan Status Gizi Pada Ibu Hamil Sebagai Upaya Mendeteksi Dini Kurang Energi Kronik (KEK). *Jurnal Kebidanan Indonesia*, 12(1).
- Septiani, B. D. S., & Sulistiawati, F. (2022). Edukasi Pedoman Umum Gizi Seimbang Bagi Ibu Hamil Kurang Energi Kronik (KEK) di Desa Batu Kuta Kecamatan Narmada Kabupaten Lombok Barat. *Abdinesia: Jurnal Pengabdian Kepada Masyarakat*, 2(2), 45–49.
- Septiani, R., & Rohayani, S. (2025). Penguatan Pengetahuan Gizi Seimbang bagi Ibu Hamil melalui Edukasi dan Implikasinya terhadap Pemahaman Perkembangan Otak Janin. *OPTIMAL: Jurnal Pengabdian Kepada Masyarakat Bidang Ilmu Kebidanan*.
- Suhadah, A., Lisca, S. M., & Damayanti, R. (2023). Hubungan pengetahuan, peran tenaga kesehatan dan dukungan suami terhadap kunjungan ANC pada ibu hamil di puskesmas Cikalong kabupaten Tasikmalaya tahun 2023. *SENTRI: Jurnal Riset Ilmiah*, 2(10), 4250–4264.
- Susanti, D., & Aisyah, S. (2024). Faktor yang Berhubungan dengan Kejadian Kekurangan Energi Kronik pada Ibu Hamil. *Lentera Perawat*, 5(1), 66–72.
- Wulandari, R., & Sumanti, N. T. (2022). Analisis faktor peran bidan, sarana prasarana dan pengetahuan ibu dalam pelaksanaan ANC terintegrasi di Praktek Bidan Mandiri (PBM) W di Bojong Gede tahun 2020. *J Kebidanan Dan Keperawatan Aisyiyah*, 18(1), 1–9.
- Yandari, D., & Apriani, L. A. (2025). Peningkatan Pengetahuan Gizi Ibu Hamil Melalui Edukasi Leaflet Nutrisi Seimbang untuk Mendukung Kehamilan Sehat. *SAMBARA: Jurnal Pengabdian Kepada Masyarakat*, 3(1), 46–54.
- Yunus, A. M. (2024). *Hubungan Tingkat Pendidikan dan Tingkat Pengetahuan dengan Kejadian Kekurangan Energi Kronik (KEK) pada Ibu Hamil di Wilayah Kerja Puskesmas Toili I dan Puskesmas Sinorang Kabupaten Banggai Sulawesi Tengah Tahun 2023*. Universitas Hasanuddin.
- Yusefni, E., & Susanti, D. (2025). Edukasi tentang Kurang Energi Kronis (KEK) pada Ibu Hamil dan Stunting pada Anak. *Jurnal Pengabdian Masyarakat Cendikia Jenius*, 3(1), 102–110.
- Zein, E. R. F., Sulistiyani, & Rachmawati, S. N. (2025). Hubungan Antara Pola Konsumsi Dan Sosial Budaya Dengan Kejadian Kekurangan Energi Kronik Pada Ibu Hamil. *Jurnal Kesehatan*, 13(1), 7–22.