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Exploring Local Food-Based Supplementary Feeding for Pregnant Women with Chronic Energy Deficiency: A Qualitative Study in Indonesia

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Abstract

Background: Chronic Energy Deficiency (CED) among pregnant women continues to pose a significant public health challenge in Indonesia, increasing risks for both maternal and fetal health. This study analyzed the compliance of pregnant women at risk of CED with the Supplementary Feeding (PMT) program and explored the potential of local foods as alternative supplements.

Methods: A descriptive qualitative approach was employed from October to December 2023 at the Parung Panjang Public Health Center in Bogor Regency. Data were obtained through in-depth interviews with nine informants, including five pregnant women at risk of CED, two healthcare professionals (a nutritionist and a midwife), and two community health volunteers. Thematic analysis was used, and findings were validated through source triangulation.

Results: Results indicated that non-compliance with the PMT program was primarily due to distribution barriers, reporting gaps, and sensory fatigue. The findings indicate that local food-based supplementary feeding may be acceptable to pregnant women with CED and could serve as an alternative to manufactured biscuits. Cassava and catfish were identified as promising raw materials because of their abundant availability and compatibility with local dietary practices

Conclusion: Further product development and intervention studies are recommended to assess nutritional adequacy, acceptability, adherence, and effectiveness.

Keywords: Pregnant Women, Malnutrition, Supplementary Feeding, Nutrition.

BACKGROUND

Maternal health is fundamental to ensuring the development of a healthy future generation. In Indonesia, a significant challenge to maternal and child health is the high prevalence of pregnant women experiencing Chronic Energy Deficiency (CED), a form of malnutrition resulting from prolonged nutrient imbalance (1,2). According to a 2023 national health survey, the prevalence of CED was 16.9% (3). The etiology of CED in pregnancy includes both direct and indirect factors. Direct causes include inadequate energy and protein intake and the presence of infectious diseases. A Mid-Upper Arm Circumference (MUAC) of less than 23.5 cm is commonly used as a screening criterion to identify pregnant women at risk for CED (1,4). CED during pregnancy increases the risk of maternal and neonatal complications, including mortality, hemorrhage, preterm birth, Intrauterine Growth Restriction (IUGR), and low birth weight (LBW) (5–7). These complications are major contributors to stunted growth and development in children (8,9). Pregnant women with CED are at greater risk of illness and require targeted attention during pregnancy. Maintaining a nutritious, balanced diet is essential for achieving and sustaining normal nutritional status before and during pregnancy (1,10,11).

The Indonesian government introduced the Provision of Supplementary Food (PMT) program as a key public health intervention to mitigate the ongoing burden of maternal CED. However, national evaluations have identified significant limitations in the program's implementation. The 2018 Riskesdas report documented that only 25% of targeted pregnant women received the manufactured PMT. Each supplementary food package for pregnant women contains three biscuits, each weighing 60 grams and providing at least 270 calories. Studies indicate that long-term compliance with manufactured biscuits is often hindered by sensory fatigue and taste issues among pregnant women, as well as challenges in community-level distribution. These biscuits are formulated with specific nutrient profiles to ensure that at-risk mothers receive consistent and adequate macro- and micronutrient support, safeguarding maternal and fetal health (12,13).

Food programs can encourage communities to use local resources as a foundation for food self-sufficiency. In 2023, the Ministry of Health initiated a strategic shift toward locally sourced, food-based PMT to address these programmatic weaknesses (12). Despite its conceptual importance, the literature still lacks localized, formative empirical evidence on how rural community health centers (Puskesmas) manage this transition in practice. In particular, little is known about socio-behavioral acceptance and the logistical readiness of key implementers as programs move from a passive, manufacturer-based system to an active, community-driven local food model. Bogor Regency has abundant local food resources, yet these remain underutilized. Innovations in locally processed foods may offer more varied alternatives that better match local cultural preferences and tastes, while supporting the local economy more sustainably.

The local food-based PMT policy is conceptually proper. However, empirical research regarding its practical field implementation remains limited. Localized, formative evidence is particularly scarce concerning how rural public health centers (Puskesmas) execute this operational transition, including the behavioral readiness of pregnant women as beneficiaries and the logistical preparedness of implementers, such as healthcare workers and community volunteers (kader). Because the scope of this study encompasses subjective dimensions such as compliance, human perceptions, and social acceptance, a qualitative approach is particularly appropriate. Quantitative metrics often fail to capture nuanced, detailed issues such as behavioral barriers, administrative reporting gaps, and lived daily experiences. Therefore, this study aimed to explore the primary causes of PMT non-compliance and assess stakeholders' prospective willingness toward local food innovations at the Parung Panjang Public Health Center, providing a vital baseline before broader programmatic deployment.

METHODS

Study Design

This study used a qualitative descriptive design. This design was selected because it directly describes participants' real-world experiences, allowing the researchers to identify complex structural barriers and natural perceptions without forcing the data into pre-existing theoretical frameworks. Data Reporting by Consolidated Criteri for Reporting Qualitative Research (COREQ).

Sample/Participans

Informants were purposively selected based on criteria relevant to the research objectives. The inclusion criteria for the main informants were pregnant women diagnosed with a risk of CED (MUAC < 23.5 cm) registered under the Parung Panjang Public Health Center. Exclusion criteria included individuals with severe, confounding chronic clinical illnesses unrelated to primary malnutrition or those planning to relocate during the study period. Informants were stratified by operational role in the study: main informants represented direct beneficiaries (pregnant women with CED), key informants represented professional program drivers (nutrition personnel and midwives), and supporting informants represented implementation links (community health volunteers/kader). Data saturation was continuously assessed during fieldwork; by the fifth interview with the main informants, no new descriptive categories or distinct themes regarding PMT access barriers emerged, indicating that data saturation had been achieved for this descriptive scope. (Table 1)

Data Collection

The was conducted data from October to December 2023 at the Parung Panjang Public Health Center in Bogor Regency, researcher maintained a detailed field diary to minimize personal preconceptions. To manage researcher bias and maintain reflexivity, the researcher used a standardized semi-structured interview guide and strictly avoided leading questions during data collection and thematic coding. Interviews were conducted by a trained female public health researcher in private rooms at the health center or at the participants' residences to ensure comfort. Sessions lasted 30–45 minutes and were conducted in Bahasa Indonesia, with local Sundanese dialects used as needed to maximize clarity. Voice recording devices and field notes were used to document observations and non-verbal cues during these sessions

Data Analysis

Data were analyzed using thematic analysis through several distinct stages: transcribing recordings into verbatim text; reducing the data by summarizing and focusing on information related to PMT compliance and local food potential; categorizing and coding the data into themes; presenting the data in narrative form, supported by direct quotes; and drawing conclusions based on identified patterns. To ensure trustworthiness (credibility, dependability, and confirmability), this study used source triangulation, peer review among authors, and a clear data-coding audit trail.

Ethical Considerations

Ethical approval was obtained from the Health Research Ethics Committee of Universitas Esa Unggul (No. 0923-10.001/DPKE-KEP/FINAL-EA/UEU/X/2023), and informed consent was secured from all participants.

RESULT AND DISCUSSION

RESULT

The Supplementary Food (PMT) program for pregnant women with Chronic Energy Deficiency (CED) consists of a government-designed sandwich biscuit product, formulated with specific nutritional considerations to ensure adequate nutrient intake. These supplements are essential for pregnant women with CED. However, several key informants reported not receiving any supplementary food from either the public health center or the integrated health post (Posyandu). The findings suggest that distribution barriers impede actual consumption. Consequently, this study investigates how field-level distribution mechanisms serve as a key structural determinant directly influencing adherence to supplement consumption.

The reporting gap highlighted a disconnect between health center records and actual household conditions, primarily resulting from strict regulations mandating that mothers collect food in person. Key and supporting informants offered an alternative perspective, noting that supplementary food from the health center was distributed to pregnant women with chronic energy deficiency (CED). The distribution process required these women to visit the health center, either alone or with a community volunteer (kader), to receive the food. Furthermore, biscuits were distributed to all pregnant women, regardless of CED status, through collaboration with the local sub-district office. Supplementary food was dispensed directly by a nutritionist at the health center and was accompanied by nutritional education.

No formal system exists to monitor compliance with food supplementation. Reliance on verbal check-ins introduces significant uncertainty about mothers' actual consumption. In this study, compliance data were based exclusively on mothers' self-reported information, rather than on clinical monitoring. Adherence is essential, as adequate nutrition significantly affects maternal and fetal health. Consequently, the PMT program is designed not only to provide direct assistance but also to promote sustained nutritional intake among pregnant women.

Study findings indicated that all primary informants expressed a strong interest in trying locally sourced supplementary foods. Informants reported a willingness to consume products specifically formulated for pregnant women with CED, should such options become available. These findings suggest a substantial demand for processed foods tailored to pregnant women's needs, particularly those with energy deficiencies. The results reflect willingness to try local foods, but do not establish acceptability. This information may serve as baseline data for the future development of locally sourced food products.

DISCUSSION

Compliance of Pregnant Women with CED in Consuming Supplementary

The research findings revealed a significant disparity in reporting between healthcare providers and pregnant women regarding the distribution of PMT. Healthcare workers and community volunteers (kader) reported systematic distribution of biscuits through Posyandu and local networks, yet several pregnant women stated that they had never received any PMT. This discrepancy highlights a disconnect between public health center records and actual household experiences. Operational distribution barriers are the primary structural determinant of non-compliance, as food often fails to reach intended households, resulting in decreased consumption. Furthermore, because compliance data in this study are based solely on informants' verbal self-reports rather than clinical metrics, the actual consumption rate cannot be objectively verified. Quantitative results indicate that only 17.9% of pregnant women received PMT, while 82.1% did not. These findings suggest that healthcare workers should implement

targeted monitoring of pregnant women with CED during PMT consumption to enhance compliance (14).

The distribution of PMT biscuits is constrained by the rigid and centralized regulations of the current program. Under the self-referral system, pregnant women are required to visit the public health center (Puskesmas) and consult with a nutritionist before receiving PMT. Many mothers encounter barriers to attendance due to transportation costs and time limitations. If a mother is unable to visit, either physically or financially, she does not receive the supplementary food. This passive, facility-based distribution model constitutes a significant barrier and unintentionally excludes the most vulnerable populations. Previous studies have demonstrated that compliance with PMT consumption among pregnant women with CED remains low, and maternal acceptance of supplementary feeding is insufficient. Additionally, the delivery of information during counseling sessions requires improvement (15–18). To enhance PMT distribution, public health center staff should collaborate closely with community volunteers (kader).

A significant limitation of the PMT biscuit program is the absence of a robust compliance-monitoring system. Interviews indicate that public health centers prioritize PMT distribution, while daily consumption is not systematically tracked. Current monitoring practices are limited to brief inquiries during monthly evaluations, such as asking whether the biscuits have been finished. This approach relies on subjective self-reporting, which hinders the identification and resolution of non-compliance. Without objective monitoring tools, such as consumption diaries or home visits by community volunteers (kader), healthcare workers are unable to detect and address issues promptly. Beyond distribution challenges, the taste of the biscuits also impedes sustained consumption. While some mothers accept the biscuits because they are provided, others find the flavor unappealing, which reduces their willingness to consume the recommended portions for the necessary duration. This observation is consistent with previous research indicating that PMT distribution remains suboptimal and that pregnant women frequently leave supplementary food unfinished due to taste preferences (16). The program should consider offering alternative food options rather than relying exclusively on manufactured biscuits.

Potential of Local Food as an Alternative Supplementary Feeding for Pregnant Women with Chronic Energy Deficiency

Qualitative findings indicate an initial willingness and receptivity among pregnant women, the primary informants, toward local food-based supplementary feeding (PMT) alternatives. This receptivity is largely attributed to sensory fatigue and taste aversion to manufactured biscuits, as identified in previous program evaluations. These findings suggest strong consumer readiness to accept alternative food products. However, this expression of interest should be interpreted as hypothetical or prospective willingness, rather than confirmed behavioral acceptability. Because participants were not exposed to a physical prototype or organoleptic testing during interviews, this interest reflects only an initial positive perception and does not guarantee sustained consumption.

Mapping initial acceptability is a critical formative stage in the design of public health interventions. Even nutritionally optimal formulas may fail if the target population rejects or dislikes the food format. Although these findings do not establish actual market demand, they confirm that the target demographic is psychologically prepared to transition from standard manufactured biscuits. Previous studies on local food-based supplementary feeding (PMT) demonstrate effectiveness in increasing gestational weight gain, improving maternal mid-upper arm circumference (MUAC), and managing pregnancy-related anemia. Furthermore, local PMT has been reported to improve newborn health outcomes (14,17,19–21).

Local food aligns with consumer preferences and is closely integrated into Indonesia's dietary culture. Processed products for pregnant women can be developed in various forms, typically as snacks.

With practical forms and packaging, these snacks can be consumed between main meals or during breakfast, lunch, or dinner (22–24). The primary purpose of these snacks is to ensure that pregnant women maintain adequate, balanced nutrient intake throughout the day, rather than simply adding variety to the menu or providing temporary satiety. This positive perception is consistent with the agricultural and geographical context of Parung Panjang. Informants and community volunteers (kader) noted that local food resources, particularly tubers and freshwater fisheries, are abundant but underutilized in public health programs. This availability indicates that the local supply chain can support independent local food-based supplementary feeding (PMT) formulation. For example, cassava can be processed into modified cassava flour (mocaf), an energy-dense carbohydrate, and combined with catfish powder, a protein source, to produce dry noodles as a more acceptable alternative snack (23,25,26). The dry noodle format is strategic because it matches Indonesian culinary habits, offers a long shelf life without refrigeration, and is versatile in presentation. Ensuring adequate and balanced nutrition through such supplementary feeding is essential for fetal development and for maintaining maternal and fetal health.

The modification of local food into specialized nutritional supplements for pregnant women is well supported by empirical literature. Previous studies have processed local cassava into Mocamil biscuits, demonstrating that cassava-based products can achieve high nutritional density for pregnant women with chronic energy deficiency (CED) (25). Rahmi combined local sweet potatoes and tempeh to create a carbohydrate–protein synergy that increased maternal weight (27). Similarly, Khairiah and Juliana developed cookies from sago flour, red beans, and red fruit extract, which, when consumed under controlled conditions, resulted in maternal weight gain of 4–5 kg over three months (28). These findings confirm that Indonesian local food resources can serve as effective supplementary foods when processed in accordance with appropriate formulation standards. However, the success of such programs depends on addressing structural distribution and monitoring barriers identified in this study. Without replacing the passive, rigid self-referral system at public health centers (Puskesmas) with a proactive distribution model led by community volunteers (kader) to the Posyandu, even the most preferred local food prototypes may face the same low coverage and geographic access challenges as the current manufactured biscuit program.

Several limitations should be considered in interpreting these findings. First, the study was conducted at a single public health center with a relatively small sample, which limits transferability to other rural or urban settings in Indonesia. Second, as this research served only as formative baseline mapping, it did not include product testing or sensory evaluation of the proposed cassava–catfish alternative, nor were clinical or nutritional outcome measures collected to assess health effects or anthropometric changes. The analysis also lacked detailed, disaggregated demographic data, restricting socioeconomic stratification of behavioral findings. Finally, the study relied primarily on self-reported interview data, which may introduce social desirability bias, as participants may have shaped responses about supplementary feeding (PMT) consumption or administrative challenges to align with perceived institutional expectations.

Table 1. Characteristics of Research Informants (n=9)

Informant Code	Informant Category	Sex	Age / Professional Tenure	Specific Role / Professional Position
MI-01	Main Informant	Female	24 Years Old	Pregnant Woman with CED
MI-02	Main Informant	Female	31 Years Old	Pregnant Woman with CED
MI-03	Main Informant	Female	19 Years Old	Pregnant Woman with CED
MI-04	Main Informant	Female	28 Years Old	Pregnant Woman with CED
MI-05	Main Informant	Female	35 Years Old	Pregnant Woman with CED
KI-01	Key Informant	Female	5 Years of Service	Public Health Center Nutritionist
KI-02	Key Informant	Female	8 Years of Service	Midwife
SI-01	Supporting Informant	Female	4 Years as Volunteer	Community Health Volunteer (*Kader Posyandu*)
SI-02	Supporting Informant	Female	10 Years as Volunteer	Community Health Volunteer (*Kader Posyandu*)

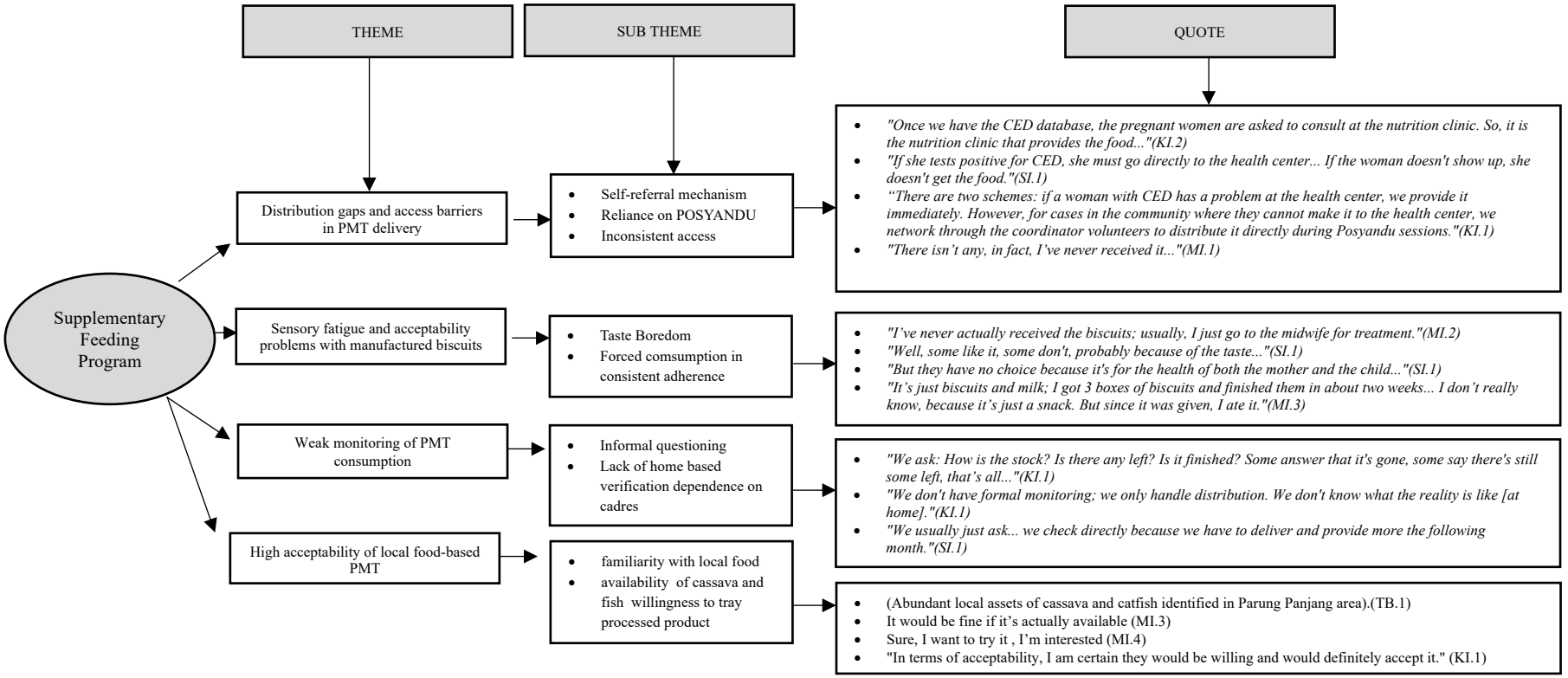


Figure 1. Summary of Qualitative Findings on Supplementary Feeding Program and Local Food Potential

CONCLUSION

In conclusion, this study found an administrative reporting discrepancy between the public health center (Puskesmas) and pregnant women receiving PMT, reflecting an operational disconnect at the community level. Passive distribution through self-referral and the absence of compliance monitoring drive non-compliance, which is further worsened by sensory fatigue toward manufactured biscuits. This study is formative and has a small sample size; therefore, direct clinical or anthropometric effects or changes in CED risk cannot be determined. However, pregnaare openn to transitioning to local food-based PMT, and cassava and catfish haveential to be developed into alternative formats to reduce taste boredom. Ultimately, the implementation of local PMT policies must be accompanied by system improvements, including proactive, volunteer-driven (kader) distribution and objective monitoring tools.

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AUTHOR'S CONTRIBUTION STATEMENT

HH: Conceptualization, Writing Original Draft, Review & Editing and Validation. AMAI: Conceptualization, Methodology, Manuscript review, and Supervision.

CONFLICT OF INTEREST

None

DECLARATION OF GENERATIVE AI AND AI-ASSISTED TECHNOLOGIES IN THE WRITING PROCESS

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DATA AVAILABILITY

The dataset generated and analyzed during the current study is available from the corresponding author upon request.

REFERENCES

1. Harna H, Rahmawati R, Irawan AMA, Sa'pang M. Prevalence and determinant factors of Chronic Energy Deficiency (CED) in pregnant women. AcTion Aceh Nutr J. 2024;9(1):65–73.doi: 10.30867/action.v9i1.1443 PDF.
2. Miele MJ, Souza RT, Calderon IM, Feitosa FE, Leite DF, Rocha Filho EA, et al. Maternal nutrition status associated with pregnancy-related adverse outcomes. Nutrients. 2021;13(7):2398.doi: 10.3390/nu13072398.
3. Kementerian kesehatan RI. Survei Kesehatan Indonesia (SKI). Vol. 01. Jakarta; 2023.
4. Harna H, Irawan AMA, Rahmawati R, Sa'pang M. Kekurangan Energi Kronik (KEK) Pada Ibu Hamil. 1st ed. Yogyakarta: PT. Penamuda Media; 2023. 120 p.

5. Indarti J, Wonodihardjo HS, Sianipar KA, Antoniman MA. Maternal and Neonatal Outcome in Pregnant Women with Chronic Energy Deficiency in Cipto Mangunkusumo General Hospital, Indonesia. Open Access Maced J Med Sci. 2023;11(B):474–9.doi: 10.3889/oamjms.2023.8509.
6. Khammarnia M, Ansari-Moghaddam A, Kakhki FG, Clark CCT, Barahouei FB. Maternal macronutrient and energy intake during pregnancy: a systematic review and meta-analysis. BMC Public Health. 2024;24(1):1–19.doi: 10.1186/s12889-024-17862-x.
7. Zewude SB, Beshah MH, Ahunie MA, Arega DT, Addisu D. Undernutrition and associated factors among pregnant women in Ethiopia. A systematic review and meta-analysis. Front Nutr. 2024;11:1347851.doi: 10.3389/fnut.2024.1347851.
8. Hunter PJ, Muthiani Y, Näsänen-Gilmore PK, Koivu AM, Pörtfors P, Bastola K, et al. A modular systematic review of antenatal interventions to address undernutrition during pregnancy in the prevention of low birth weight. Am J Clin Nutr. 2023;117(1):S134–47.doi: 10.1016/j.ajcnut.2023.01.024.
9. Young MF, Ramakrishnan U. Maternal undernutrition before and during pregnancy and offspring health and development. Ann Nutr Metab. 2021;76(3):41–53.doi: 10.1159/000510595.
10. Hidru HD, Berwo Mengesha M, Hailesilassie Y, Tekulu Welay F. Burden and Determinant of Inadequate Dietary Diversity among Pregnant Women in Ethiopia: A Systematic Review and Meta-Analysis. Vol. 2020, Journal of Nutrition and Metabolism. 2020.doi: 10.1155/2020/1272393.
11. Ahmed T, Hossain M, Sanin KI. Global burden of maternal and child undernutrition and micronutrient deficiencies. Ann Nutr Metab. 2012;61(Suppl. 1):8–17.doi: 10.1159/000345165.
12. Kemenkes RI. Petunjuk Teknis Pemberian Makanan Tambahan (PMT) Bahan Pangan Lokal bagi Ibu Hamil KEK dan Risiko KEK serta Balita. Jakarta: Direktorat Gizi Masyarakat Kementrian Kesehatan Republik Indonesia. Jakarta; 2025.
13. Kemenkes. Laporan Hasil Riset Kesehatan Dasar (Riskesdas) Nasional 2007. Jakarta Badan Litbangkes, Depkes RI. 2018;
14. Juliasari Fitri, Fitria Ana Elsa. Pemberian Makanan Tambahan (PMT) Dengan Kenaikan Berat Badan Ibu Hamil KEK. J Matern Aisyah (JAMAN AISYAH). 2022;3(1):27–31.doi: 10.30604/jaman.v3i1.405.
15. Puspitasari M, Mitra M, Gustina T, Ranyin N, Zulfayeni Z. Pemberian Makanan Tambahan pada Ibu Hamil KEK di Puskesmas Karya Wanita Pekanbaru. J Kesehat Manarang. 2021;7(2):141–153.doi: 10.33490/jkm.v7i2.325.
16. Rohmah L. Program Pemberian Makanan Tambahan pada Ibu Hamil Kekurangan Energi Kronis. Higeia J Public Heal Res Dev. 2020;4(Special 4):812–23.doi: 10.15294/higeia.v4iSpecial%204.37052.
17. Damayanti M, Aminin F, Jannah R, Mukodri DML, Saputri NAS, Jasda A, et al. Efektifitas pemberian makanan tambahan lokal (PMT) terhadap kesejahteraan ibu hamil: Literature review. J SAGO Gizi dan Kesehat. 2025;6(2):334–44.doi: 10.30867/gikes.v6i2.2415.
18. Hernawati Y, Kartika R. Hubungan Pemberian Makanan Tambahan Pada Ibu Hamil Dengan Kurang Energi Kronis Di Wilayah Kerja Puskesmas Ibrahim Adjie Kota Bandung. J Sehat Masada. 2019;13(1):40–6.
19. Suarayasa K, Umar M. Evaluation of Local Supplementary Food Provision Program (PMT) For Pregnant Women with KEK in Palu City. Curr Clin Med Educ. 2024;2(12):4–12.
20. Suciawati A. Efektivitas Pemberian Biskuit PMT Terhadap Peningkatan Lingkar Lengan Atas Ibu Hamil di Puskesmas Rengas Dengklok Kabupaten Karawang Tahun 2021. J Penelit dan Kaji Ilm Kesehat Politek Medica Farma Husada Mataram. 2021;7(2):104–10. 10.33651/jpkik.v7i2.253.

21. Janggu JP, Nanur FN. Pelatihan Penyiapan Makanan Tambahan Pangan Lokal Bagi Ibu Hamil KEK dan Balita Gizi Kurang: Indonesia. J Pengabdi Kpd Masy Nusant. 2024;5(3):2976–82. 10.55338/jpkmn.v5i3.3397.
22. Sari NA, Maryanto S, Anugrah RM. Product Development Based On Local Milkshake Food In Sweet Potatoes As Healthy Service For School Children. Fak Ilmu Kesehat Univ Ngudi Waluyo. 2019;11(25):54–9.
23. Harna H, Swamilaksita PD, Sa'pang M, Irawan AMA. The Development of Cookies from Modified Cassava Flour with Soy Isolate Protein (ISP) Substitution as an Alternative Supplementary Food for Pregnant Women with CED. Int J Curr Sci Res Rev. 2023;6(2):1752–8.doi: 10.47191/ijcsrr/V6-i2-95.
24. Feldmann C, Hamm U. Consumers' perceptions and preferences for local food: A review. Food Qual Prefer. 2015;40:152–64.doi: 10.1016/j.foodqual.2014.09.014.
25. Harna H, Suswanto W, Sa'pang M, Swamilaksita PD, Irawan AMA, Eflin V, et al. PKM Kelompok Bidan dalam mengatasi Kurang Energi Kronis Berbasis Edupad Di Puskesmas Parung Panjang. Piramida J Pengabdi Kpd Masy. 2023;2(2):27–34.
26. Harna H, Sitoayu L, Irawan AMA, Sa'pang M, Novianti T. Effect of Clarias gariepinus and Mocaf Flour Ratio on the Physicochemical Properties of Noodles as an Alternative Supplementary Food for Pregnant Women with Undernutrition. J Res Innov Food Sci Technol. 2025;14(4):273–80.doi: 10.22101/JRIFST.2025.489229.1602.
27. Aliya LS, Rahmi Y, Soeharto S, Sunarti S, Ahda M, Mudayana AA, et al. Biscuits Substitution with Tempe and Catfish Flour Increase Birth Weight of Infants Born from Mothers with Chronic Energy Deficiency. Kesmas J Kesehat Masy Nas (National Public Heal Journal). 2022;3(1):44–51.doi:10.2991/adics-phs-19.2019.24.
28. Khairiah R, Juliana. Effectiveness of Local Food Ingredients (Sago Flour, Red Bean Flour, And Red Fruit Juice) as A Base for Supplementary Feeding of Chronically Energy-Deficient Pregnant Women on Weight Gain of Chronically Energy-Deficient Pregnant Women. J Ilm Keperawatan (Scientific J Nursing). 2023;9(1):117–23.doi: .doi: 10.33023/jikep.v9i3.1597.