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Family Empowerment Through Health Promotion in Managing Anemia and Chronic Energy Deficiency Among Pregnant Women in Labulia Village

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Abstract. *Anemia and chronic energy deficiency (CED) are common nutritional problems among pregnant women, adversely affecting maternal and fetal health. One effective strategy to address these issues is structured and targeted nutrition education. This study aimed to evaluate the effectiveness of a health education intervention in improving pregnant women's knowledge regarding anemia and CED. The activity was conducted at Posyandu Anyelir, Labulia Village, involving 15 pregnant women. The method used included interactive lectures and group discussions. Participants' knowledge was assessed through pretest and posttest evaluations. The results showed that before the education session, only 5 participants (33.3%) had good knowledge, which increased to 12 participants (80%) afterward. This significant improvement indicates that the applied educational methods were effective in enhancing understanding of anemia and CED prevention during pregnancy. In conclusion, the health education activity effectively increased pregnant women's knowledge. It is recommended that similar programs be implemented sustainably in collaboration with relevant stakeholders to reduce the prevalence of anemia and CED in the community.*

Keywords: *Anemia, CED, pregnant women, nutrition education, knowledge*

1. INTRODUCTION

Anemia during pregnancy is a significant maternal health issue and remains a global challenge, particularly in developing countries. The World Health Organization (WHO, 2016) defines anemia in pregnancy as a hemoglobin (Hb) level of less than 11 g/dL during pregnancy and less than 10 g/dL during the postpartum period. More than half of anemia cases in pregnancy are caused by iron deficiency. During pregnancy, iron requirements increase substantially to support fetal and placental growth, as well as the expansion of maternal blood volume. A pregnant woman weighing approximately 55 kg requires around 1200 mg of iron throughout pregnancy, with daily needs rising from 0.8 mg in the first trimester to more than 6 mg in the third trimester (Skolmowska et al., 2022).

The global prevalence of anemia in pregnant women remains high, reaching approximately 36%, with the majority of cases occurring in developing nations. This condition contributes to a range of obstetric and neonatal complications, such as postpartum hemorrhage, preterm labor, low birth weight (LBW), and even maternal and neonatal mortality. According to a UNICEF (2021) report, more than 20 million babies worldwide are born with LBW, with

about 95% of these births occurring in developing countries. In Indonesia, the prevalence of anemia and chronic energy deficiency (CED) among pregnant women is a serious concern within the framework of the first 1000 days of life—a critical window for nutritional intervention to prevent stunting and impaired child development (Díaz-Torres et al., 2024).

Various interventions have been implemented to address anemia and CED in pregnancy, including iron-folic acid supplementation (IFAS), food fortification, and nutrition education. According to the Indonesian Ministry of Health (2021), the coverage of IFAS among pregnant women increased from 64% in 2019 to 83.6% in 2020. However, this increase in coverage has not been fully effective in reducing anemia prevalence, indicating that behavioral factors, knowledge, and compliance with supplement intake remain key challenges. A study by Rahman et al. (2022) showed that digital education through the "MyPinkMom" program significantly improved maternal knowledge and adherence to IFAS consumption, resulting in a notable increase in hemoglobin levels ($p < 0.001$).

In terms of treatment, innovations such as intravenous iron administration (Ferric Carboxymaltose) have shown promising results. Studies conducted in Malawi and India revealed that intravenous iron is more effective and faster in raising hemoglobin levels among pregnant women with moderate to severe anemia, especially during the third trimester (RAPIDIRON Trial, 2021; Nature Medicine, 2023). This represents an important alternative in areas with limited access to care or high risks of pregnancy complications due to anemia. Although requiring trained health personnel, this intervention can complement the management of pregnancy-related anemia that is unresponsive to oral treatment.

At the local level, data from Ubung Public Health Center in 2023 reported that out of 35 high-risk pregnant women, 10 had anemia and 12 experienced CED. Similarly, in Labulia Village, Jonggat District, 24 high-risk pregnant women were identified, of whom 8 were anemic and 5 had CED (PWS-KIA, 2023). These situations reflect serious challenges in fulfilling the sustainable nutritional needs of pregnant women. CED, a form of chronic undernutrition caused by long-term insufficient energy intake, poses serious risks to fetal growth and development, such as stunting, prematurity, LBW, and even fetal or neonatal death (Putri & Salsabila, 2023).

Addressing anemia and CED requires more than just supplement distribution; it demands a holistic approach involving families and communities. Empowering families through nutrition education and sustained support from community health workers or midwives has

been proven to enhance maternal nutritional status and compliance with nutritional interventions. A meta-analysis by Arija et al. (2024) emphasized that family-based health promotion has a significant impact on increasing hemoglobin levels and reducing obstetric complications. This intervention also improves the understanding and involvement of family members in safeguarding maternal health.

Based on these conditions, it is crucial to implement a community service program using promotive and preventive approaches in Labulia Village, Jonggat District. This initiative is expected to serve as an effective intervention to reduce anemia and CED in pregnant women through family empowerment and health education strategies. The program aims to foster collective awareness, promote healthy nutritional behavior, and support national efforts to reduce stunting and maternal and neonatal mortality rates.

2. METHODE

The research method used in this activity is a quantitative descriptive study with a one-group pretest-posttest design. This study aims to evaluate the effectiveness of a health education session in improving pregnant women's knowledge about anemia and chronic energy deficiency (CED). The activity is part of a community service program conducted by students of the Community Service Program (KKN) from the Faculty of Health, UNIQHBA. The study was carried out at Posyandu Angsoka, located in Labulia Village, Jonggat Subdistrict, Central Lombok Regency, on February 13, 2025. The location was selected based on data from the PWS-KIA (Maternal and Child Health Surveillance), which indicated the presence of anemia and CED cases in the area, making it a relevant site for educational intervention.

The population of the study included all pregnant women in the working area of Puskesmas Ubung, with a sample of 15 pregnant women who attended the health education session and met the inclusion criteria: willing to participate, actively attending the session, and able to communicate effectively. The sampling technique used was purposive sampling. The research instrument was a questionnaire containing questions related to knowledge about anemia and CED in pregnant women, covering aspects such as general knowledge, symptoms, risk factors, prevention, and management. Educational media such as leaflets and posters were also used to support the delivery of material.

The health education session was carried out in three stages: pre-interaction, interaction, and post-interaction. The pre-interaction stage lasted 15 minutes and included an introduction to the session, student introductions, and an oral pretest to assess participants' initial knowledge. The interaction stage lasted 60 minutes, during which the education session was

delivered through interactive lectures and group counseling using simple, easy-to-understand language supported by visual aids. The post-interaction stage lasted 45 minutes and included a discussion and evaluation of participant understanding through an oral posttest using the same questions as in the pretest.

Pretest and posttest results were analyzed using descriptive quantitative methods and presented as percentages to illustrate changes in participants' knowledge levels before and after the intervention. The increase in the number of participants who were able to answer questions correctly after the session served as an indicator of the success of the health education in improving pregnant women's understanding of anemia and CED.

3. RESULT AND DISCUSSION

a. Result

1) Characteristics

Table 1. Characteristics of Pregnant Women Participating in the Health Education at Posyandu Anyelir, Labulia Village (N = 15)

Characteristics	Category	n	%
Age	< 20 years old	2	13.3
	20–35 years old	11	73.3
	> 35 years old	2	13.3
Education	No formal education	1	6.7
	Primary/Junior High School	6	40
	Senior High School	7	46.7
	Higher Education	1	6.7
Occupation	Housewife	10	66.7
	Employed (formal/informal sector)	5	33.3
Gestational Age	First Trimester	3	20
	Second Trimester	6	40
	Third Trimester	6	40
Parity	Primigravida (first pregnancy)	4	26.7
	Multigravida (second or more)	11	73.3

Table 1 presents the characteristics of 15 pregnant women who participated in the counseling activity. Based on age groups, the majority of participants were between 20 and 35 years old, totaling 11 individuals (73.3%), while 2 participants (13.3%) were under 20 years old and another 2 (13.3%) were over 35 years old. In terms of education, most of the pregnant women had completed senior high school (SMA), with 7 individuals (46.7%), followed by 6 individuals (40%) who had completed primary or junior high school (SD/SMP). Only one participant (6.7%) had no formal education, and another one (6.7%) had a higher education qualification.

Regarding occupation, the majority of respondents were housewives, accounting for 10 individuals (66.7%), while the remaining 5 participants (33.3%) were employed in either the formal or informal sector. In terms of gestational age, the participants were almost evenly distributed between the second and third trimesters, with 6 individuals (40%) in each, and 3 individuals (20%) in the first trimester. As for parity, 11 individuals (73.3%) were multigravida (experiencing their second or subsequent pregnancy), and 4 individuals (26.7%) were primigravida (in their first pregnancy).

2) Pregnant Women's Knowledge about Anemia and Chronic Energy Deficiency (CED)

Table 2. Results of Pretest and Posttest on Pregnant Women's Knowledge about Anemia and Chronic Energy Deficiency (CED)

No	Assesment	Knowledge			
		Good		Poor	
		n	%	n	%
1	Pretest	5	33.3	10	66.7
2	Posttest	12	80.0	3	20

Table 2 shows the results of the pretest and posttest assessments on pregnant women's knowledge about anemia and chronic energy deficiency (CED). During the pretest, only 5 participants (33.3%) demonstrated good knowledge, while the remaining 10 participants (66.7%) had poor knowledge. After the counseling session, the posttest results showed a significant improvement: 12 participants (80.0%) achieved good knowledge scores, and only 3 participants (20.0%) remained in the poor category. These results indicate that the educational intervention was effective in increasing the participants' knowledge about anemia and CED.

b. Discussion

The implementation of the educational outreach for 15 pregnant women at the Anyelir Posyandu in Labulia Village showed a significant improvement in knowledge, increasing from 33.3% (5 participants) in the pretest to 80.0% (12 participants) in the posttest. This increase aligns with the findings of Abd Rahman et al. (2022), who implemented the Theory-Based MyPinkMom program via a messaging application and reported a significant improvement in both knowledge levels and hemoglobin levels ($p < 0.001$). Similarly, a study in Grogol (2023) demonstrated that intensive nutritional counseling using leaflets for 15–20 minutes improved knowledge by 28.6%, attitudes by 17.1%, and adherence to iron tablet consumption by 22.8% ($p \leq 0.002$).

Empowering families through health promotion plays a crucial role in managing anemia and chronic energy deficiency (CED) among pregnant women. This approach not only focuses on medical interventions but also emphasizes community involvement and health education as sustainable long-term strategies. Nutritional support programs have been shown to significantly improve the dietary intake of pregnant women with anemia and CED, thereby contributing to better maternal and infant health outcomes (Simbolon et al., 2022). Additionally, educational interventions such as home visits and interactive lectures have demonstrated significant impacts on increasing nutritional knowledge and practices, with comprehension improving by up to 48% following the intervention (Tampubolon et al., 2023).

Health promotion strategies, as highlighted in the systematic review by Indriyani et al. (2024), can effectively change health behaviors in pregnant women, although local cultural challenges must be addressed to achieve optimal results. Structured classroom-based learning has also been proven to enhance knowledge and attitudes related to anemia prevention among pregnant women (Harahap et al., 2023). Moreover, the involvement of community health workers in accompanying pregnant women has been effective in strengthening family support systems, improving access to information, and monitoring iron tablet consumption (Setyowati et al., 2022). Therefore, a combination of educational strategies, social support, and community-based health promotion constitutes an effective approach that can be replicated across various regions to reduce the prevalence of anemia and CED in pregnant women.

The effectiveness of the interactive lecture and group counseling methods used in this program is further supported by Rewakwoya et al. (2023), who found that a nutrition education intervention based on the Health Belief Model, supplemented with SMS reminders and leaflets, led to an increase in hemoglobin levels from 12.08 g/dL to 12.53 g/dL and a reduction in anemia prevalence from 14.7% to 9.2% ($p = 0.01$). A similar community-based intervention in Ethiopia involving education and iron supplementation also reinforced these findings, showing that community-oriented approaches and consistent reminders can effectively improve IFAS (Iron and Folic Acid Supplementation) adherence and the nutritional status of pregnant women(Muslim & Ismiati, 2025; Puspita & Oktaviana, 2023; Winanti & Ismiati, 2025).

Systematic reviews also emphasize the importance of visual educational media. Skolmowska et al. (2022), in a meta-analysis, found that the use of illustrated educational materials significantly enhances pregnant women's comprehension in nutritional

interventions. This supports the conclusion that combining visual media, interactive lectures, and digital reminders is highly effective in improving pregnant women's knowledge and health-related behaviors(Hermayani & Maran, 2023; Nurmeini et al., 2025).

However, despite these positive outcomes, some methodological limitations remain, such as the absence of a control group, the relatively small sample size (n=15), and the lack of hemoglobin level measurement as an objective indicator. Previous studies by Rewakwoya et al. (2023) and Abd Rahman et al. (2022) have recommended the use of randomized controlled trial (RCT) designs with larger sample sizes and biometric assessments such as hemoglobin levels, supplement adherence, or nutritional status indicators like MUAC (Mid-Upper Arm Circumference) for more comprehensive validation.

Overall, the results of this activity are consistent with current literature: educational interventions based on theoretical frameworks (such as the Health Belief Model), technological tools (like mobile messaging), visual media support, and community strategies can significantly enhance knowledge and nutritional status. This model has strong potential to be adapted and scaled in other areas as an effective strategy for combating anemia and chronic energy deficiency (CED) in pregnant women.

4. CONCLUSION

Based on the community service activity that was carried out, it can be concluded that pregnant women's knowledge about anemia and chronic energy deficiency (CED) was still suboptimal before the health education session, as evidenced by only 5 participants (33.3%) out of 15 being able to answer the pretest questions correctly. After the educational session, there was a significant improvement, with 12 participants (80%) correctly answering the posttest questions. This indicates that interactive health education activities are effective in enhancing pregnant women's understanding. Therefore, it is recommended that similar activities be conducted on an ongoing basis through active collaboration between the community and relevant stakeholders, so that health education efforts on anemia, CED, and other health issues become more effective and provide long-term impact. The community is encouraged to be more concerned about anemia and CED in pregnant women by adopting clean and healthy lifestyles, while pregnant women are advised to regularly take iron supplements and consume a nutritionally balanced diet to maintain their own health and that of their fetus.

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