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The Impact of Nutritional Counseling Using Flyers on Knowledge of Chronic Energy Deficiency (CED) Among Pregnant Women

Abstract

Chronic energy deficiency (CED) is one of the nutritional problems of pregnant women that can be prevented through counseling. The prevalence of CED at the Waara Community Health Center in 2022 (20.9%), in 2023 (29.8%) and in 2024 (32.2%). The purpose of this study was to determine the effect of nutritional counseling using flyers on knowledge about CED in pregnant women. This study was conducted in the working area of the Waara Community Health Center, Muna Regency from July 5 to August 10, 2025. The sample was 27 pregnant women in the working area of the Waara Community Health Center in 2025 during the July-August period, taken by total sampling. Data were collected using a questionnaire and tested using a paired t-test. The results of the study on 27 samples, the average score of knowledge of pregnant women before counseling was 7, and after was 10. The results of the paired t-test obtained a p-value of 0.000. The conclusion is that nutritional counseling using flyers has an effect on knowledge about KEK among pregnant women in the Waara Community Health Center, Muna Regency

Keyword: : Counseling, Nutrition, Flyer, Knowledge, Pregnant Women

INTRODUCTION

Nutritional issues in pregnant women are a serious concern that requires urgent attention. One such issue is Chronic Energy Deficiency (CED), a condition marked by an imbalance in energy and protein intake, leading to insufficient nutrient supply for the body's needs (Eli, 2025, Fibrila et all., 2024). CED in pregnant women can disrupt fetal growth and development affecting physical growth, brain function, and metabolism which may result in non-communicable diseases in adulthood (Septrierly et all., 2024). It also increases the risk of prolonged labor, postpartum hemorrhage, and even maternal mortality (Angraini et all., 2024). For infants, the risks include fetal death, prematurity, birth defects, low birth weight (LBW), and neonatal mortality (Indonesian Ministry of Health, 2023).

The World Health Organization (WHO) reported in 2024 that the global prevalence of Chronic Energy Deficiency (CED) among pregnant women stands at 36.8% (WHO, 2024). Meanwhile, in Indonesia, according to the latest data from the 2023 Indonesia Health Survey (SKI), the prevalence of CED among pregnant women is 16.9%. This figure shows a decline compared to the 2018 Basic Health Research (Riskesdas), which recorded a CED prevalence of 17.3% (Indonesian Ministry of Health, 2023). The Muna District Health Office is one of the working areas in Southeast Sulawesi Province where the prevalence of chronic energy deficiency (CED) among pregnant women has increased. The CED prevalence in the Muna District Health Office was 15.2% in 2022, rising to 16.9% in 2023 (Muna District Health Office, 2023).

The highest number of CED cases was recorded at Waara Community Health Center, with a rate of 20.9% in 2022, increasing to 29.8% in 2023 and further rising to 32.2% in 2024. The CED prevalence at Waara Community Health Center exceeds the target achievement rate of 15% (Waara Community Health Center, 2024). One of the causes of the increase in CED cases at Waara Community Health Center is the lack of education, particularly nutritional counseling, provided to pregnant women, resulting in insufficient knowledge about proper nutrition during pregnancy.

An indirect contributing factor to pregnant women being at risk of Chronic Energy Deficiency (CED) is their lack of nutritional knowledge. One intervention strategy involves providing nutritional education through various media such as leaflets (Indonesian Ministry of Health, 2023). Adequate nutritional knowledge among pregnant women is crucial to ensure balanced dietary intake during pregnancy. Maternal understanding of proper food consumption plays a vital role in preventing CED cases, making nutritional counseling particularly important. Insufficient knowledge can lead to inappropriate maternal attitudes and behaviors toward nutrition, ultimately affecting dietary intake. This situation stems from persistently low levels of nutritional awareness (Sari & Sapitri, 2021).

The study by Panjaitan et al. (2022) found that low knowledge levels are significantly associated with the occurrence of chronic energy deficiency (CED) in pregnant women (Auranissa et all., 2025). One effective approach is through Communication, Information, and Education (CIE), which is expected to enhance knowledge, skills, and motivation among expectant mothers (UNICEF, 2021). Nutritional counseling serves as a method in dietary care to help individuals gain better understanding of their challenges (Cornelia et al., 2024).

This research opted for leaflets and counseling for pregnant women because leaflets are a relatively inexpensive and easily distributable health promotion tool. By evaluating the effectiveness of leaflets in this context, this study can provide insights into how this print medium can be optimally utilized in public health programs (Alfina et all., 2024). The findings may be used to refine and optimize other health promotion strategies (Kustandi, 2023). As a health promotion tool, leaflets deliver concise information that's easily accessible to the public (Mastuti, 2023, Nadimin and Asikin, 2025).

A preliminary survey conducted among 5 pregnant women in the Waara Community Health Center area found that 100% reported never having received leaflets related to Chronic Energy Deficiency (CED), while 80% of pregnant women had limited knowledge about CED. Additionally, no research has been conducted in the Waara Community Health Center's

working area on the effect of nutritional counseling on pregnant women's knowledge. Therefore, the author is interested in conducting a study titled "The Effect of Nutritional Counseling Using Flyer Media on Knowledge About CED Among Pregnant Women in the Working Area of Waara Community Health Center, Muna Regency. This study aims to determine the effect of nutritional counseling using flyer media on knowledge of Chronic Energy Deficiency (CED) among pregnant women in the working area of Waara Community Health Center, Muna Regency.

METHODS

The study employed a quantitative research method with a pre-experimental design. The research framework followed a pre-test post-test design. This study was conducted within the operational area of Waara Community Health Center in Muna Regency from July 5 to August 10, 2025. The study population comprised all pregnant women in Waara Community Health Center's coverage area during the July-August 2025 period, totaling 27 individuals. The sample for this research consisted of 27 pregnant women within Waara Community Health Center's operational area during the July-August 2025 period. The sampling technique utilized total sampling, where the entire population served as the sample. The research instrument employed in this study was a questionnaire used for data collection. The validity test results from 10 respondents showed an average calculated r-value above 0.444, confirming that all questionnaire items were valid. The reliability test results from the same 10 respondents yielded a Cronbach's alpha value of 0.85 (>0.6), indicating all questionnaire items were reliable.

Primary data collection was conducted directly from respondents using questionnaires. The collected data included respondent identity information such as age, education level, occupation, and knowledge about KEK (Chronic Energy Deficiency). To analyze the relationship between the dependent and independent variables, a Shapiro-Wilk normality test is first conducted. If the data is normally distributed, a paired t-test is performed. If the data is not normally distributed, the alternative Wilcoxon signed-rank test is used instead (Sugiyono, 2021).

RESULTS

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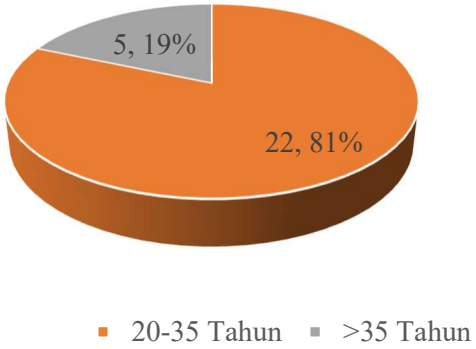
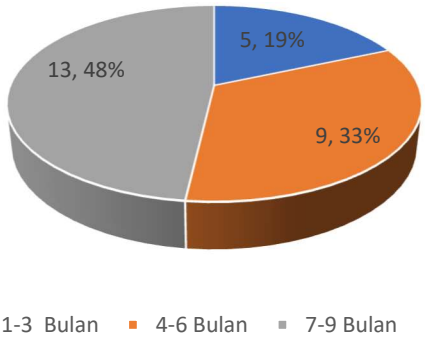
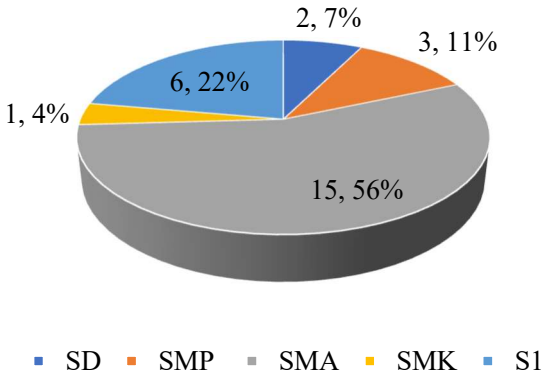


Picture 1. Sample Distribution by Age

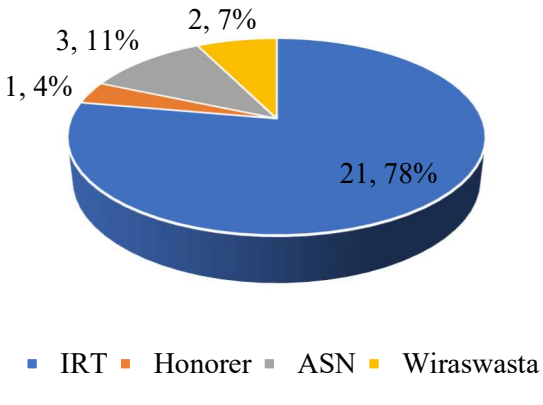


Picture 1. Sample Distribution Based by Gestational Age

Figures 1 and 2 show that of the 27 samples, the majority of the age characteristics were between 20-35 years, 22 (81.5%). The majority of the gestational age of the samples was in the third trimester (7-9 months), 13 (48.1%).

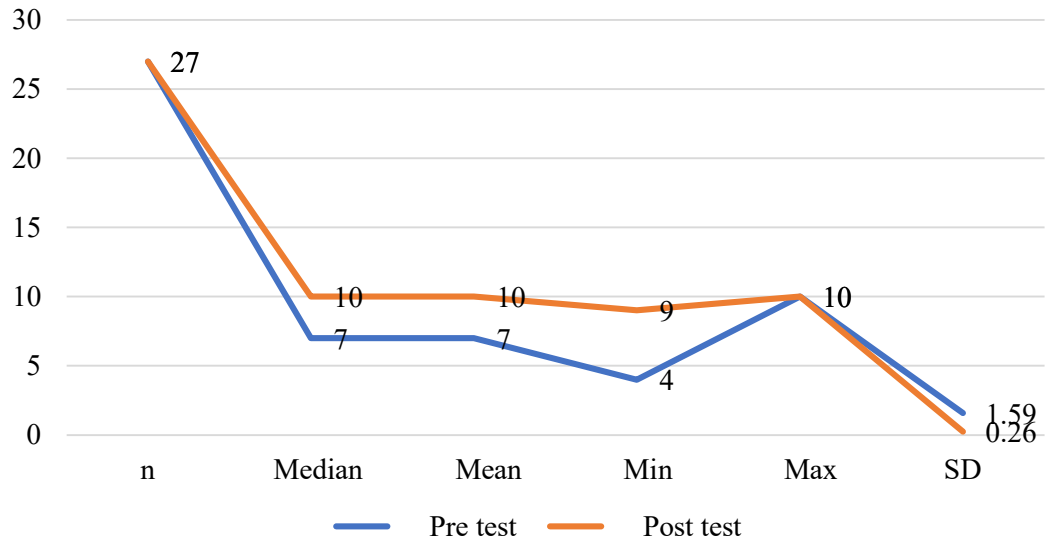


Picture 3. Sample Distribution by Education



Picture 4. Sample Distribution by Occupation

Tables 3 and 4 show that the education of the pregnant women was mostly high school graduates, as many as 15 people (55.6%) and the occupation of the pregnant women was mostly housewives, as many as 21 people (77.8%). The descriptive analysis of variables includes the results of processing data on pregnant women's knowledge before and after nutritional counseling using flyers. For further details, please refer to Table 1 below:



Picture 5 . Knowledge Distribution on Chronic Energy Deficiency (CED) Before and After Nutrition Counseling Using Flyer Media Regarding CED Knowledge Among Pregnant Women

Picurer 5 shows that out of 27 samples, the average knowledge score of pregnant women before counseling using flyers was 7, with a minimum score of 4 and maximum of 10, and a standard deviation (SD) of 1.59. The median knowledge score after counseling using flyers was 10, with a minimum score of 9 and maximum of 10, and a standard deviation (SD) of 0.26.

Before analyzing the relationship between independent and dependent variables, a normality test was first conducted using the Shapiro-Wilk test. The normality test results for the difference in knowledge scores before and after counseling showed a p-value of 0.136 > 0.05, indicating normally distributed data. Therefore, the data were analyzed using a paired t-test. For details, see Table 1 below:

Table 1. The Effect of Nutrition Counseling Using Flyer Media on Knowledge of Chronic Energy Deficiency Among Pregnant Women in the Working Area of Waara Community Health Center, Muna Regency Knowledge Variable

Knowledge Variables	**n**	***p value***
Pre Test (Before counseling)	27	0,000
Post Test (After counseling)		

Table 2 shows that out of 27 samples, a p-value of 0.000 was obtained, meaning p-value < 0.05. Therefore, the alternative hypothesis is accepted, indicating that nutritional counseling using flyer media has a significant effect on knowledge about Chronic Energy Deficiency

(CED) among pregnant women in the working area of Waara Community Health Center, Muna District.

DISCUSSION

The research findings indicate that the average nutritional knowledge score among pregnant women prior to receiving counseling using flyer media was 7, with a minimum score of 4, maximum of 10, and a standard deviation (SD) of 1.59, reflecting existing variations in knowledge levels among respondents. Following the counseling intervention, a significant improvement was observed—the median knowledge score rose to 10, with minimum and maximum scores of 9 and 10 respectively, and an SD of 0.26. This demonstrates that nearly all participants achieved uniformly high knowledge levels.

The research findings indicate that the average nutritional knowledge score among pregnant women prior to receiving counseling using flyer media was 7, with a minimum score of 4, maximum of 10, and a standard deviation (SD) of 1.59, reflecting existing variations in knowledge levels among respondents. Following the counseling intervention, a significant improvement was observed—the median knowledge score rose to 10, with minimum and maximum scores of 9 and 10 respectively, and an SD of 0.26. This demonstrates that nearly all participants achieved uniformly high knowledge levels

The study results indicate an increase in pregnant women's knowledge about Chronic Energy Deficiency (CED) after receiving nutritional counseling using flyers, with a p-value = 0.000, signifying a significant difference between pre- and post-intervention. This aligns with the theory that visual media like flyers can help convey health information in a simpler, more engaging, and easily understandable manner particularly for pregnant women who may face limitations in accessing nutritional information

These results confirm that flyers effectively deliver nutritional information in a simple, clear, and easily understandable format for pregnant women. The marked improvement also highlights how print-based nutrition education interventions can enhance mothers' understanding of chronic energy deficiency (CED) prevention during pregnancy. Consequently, this approach holds potential to positively influence dietary behaviors, thereby supporting maternal and fetal health.

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engaging, and easily understandable manner particularly for pregnant women who may face limitations in accessing nutritional information.

This knowledge improvement is crucial because a proper understanding of CED can influence mothers' attitudes and behaviors in meeting nutritional needs during pregnancy, thereby helping prevent complications, low birth weight, and future stunting risks. These findings support prior research stating that print media-based nutritional counseling effectively enhances pregnant women's knowledge and awareness regarding reproductive health and nutritional status.

This research is supported by UNICEF, which highlights that one viable approach is through Communication, Information, and Education (KIE), aimed at enhancing knowledge, skills, and motivation among pregnant women (Gregg, 2025, UNICEF, 2021). Similarly, Cornelia et al. (2024) suggest that nutritional counseling serves as a method within dietary care to help individuals gain a better understanding of the challenges they face

Leaflets are a relatively low-cost and easily distributable health promotion tool (Rosadi et all., 2025). By assessing their effectiveness in this context, the study can provide insights into how this print medium can be optimally utilized in public health programs. The findings may also contribute to refining and optimizing other health promotion strategies (Kustandi, 2023). As a health promotion medium, leaflets deliver concise and easily accessible information to the public (Mastuti, 2023). This study is supported by the statement that adequate nutritional knowledge among pregnant women is crucial to ensure balanced and nutritious food consumption during pregnancy. A mother's understanding of dietary intake can help prevent chronic energy deficiency (CED), making counseling highly essential. Lack of knowledge may lead to inappropriate maternal attitudes and behaviors toward nutrition, ultimately affecting dietary intake. This issue arises due to persistently low awareness levels (Istiqomah et all., 2025, Sari & Sapitri, 2021).

CONCLUSIONS

The conclusion of this study is that there is a significant difference in knowledge about Chronic Energy Deficiency (CED) before and after nutrition counseling using flyers among pregnant women in the working area of Waara Community Health Center, Muna Regency, with a p-value of 0.000. Recommendations For Waara Community Health Center, Muna Regency to Continue optimizing nutrition counseling activities by utilizing flyers, as they have proven effective in increasing pregnant women's knowledge about CED. The health center

should also conduct regular monitoring and evaluation, not only on knowledge aspects but also on attitudes and nutritional behaviors of pregnant women, to ensure the educational impact is comprehensively measurable in CED prevention.

For Future Researchers to Expand the assessment beyond knowledge to include changes in attitudes and nutritional behaviors of pregnant women post-intervention. This will help determine the extent to which knowledge influences actual CED prevention actions. Additionally, compare the effectiveness of various educational media (e.g., flyers, leaflets, videos, digital applications, or a combination of media) to identify the most optimal medium for enhancing pregnant women's understanding.

We would like to express our deepest gratitude to the Directorate General of Research and Development of the Ministry of Higher Education, Science and Technology and the Karya Kesehatan College of Health Sciences for facilitating and supporting the completion of this article.