Journal of Neonatal Surgery
ISSN(Online): 2226-0439
Vol. 14, Issue 1s (2025)
https://www.jneonatalsurg.com

OPEN ACCESS

Evaluation of Supplementary Feeding (PMT) of Mung Bean Biscuits in Ced Pregnant Women

Zulaeha Baluntu[1], Mardiana Ahmad[2], Veni Hadju[3], Hasta Handayani Idrus[4,5]

[1]Al-Mawanee Teaching Hospital, Basra Health directorate, ministry of health, Iraq.

[2]Clinical Pharmacy Department, College of Pharmacy, University of Basra, Iraq.

[1]Midwifery Study Program, Hasanuddin University Postgraduate School, Indonesia

[2]Department Master of Midwifery, Postgraduate School, Hasanuddin University, Makassar, Indonesia

[3]Department of Public Health, Faculty of Public Health, Hasanuddin University, Makassar, Indonesia

[4]Department of Biomedical Sciences, Postgraduate School, Hasanuddin University (UNHAS), Makassar, Indonesia

[5]Center for Biomedical Research, Research Organization for Health, National Research and Innovation Agency (BRIN), Jakarta, Indonesia

Cite this paper as: Zulaeha Baluntu, Mardiana Ahmad, Veni Hadju, Hasta Handayani Idrus, (2025) Evaluation of Supplementary Feeding (PMT) of Mung Bean Biscuits in Ced Pregnant Women. *Journal of Neonatal Surgery*, 14 (1s), 628-648.

ABSTRACT

INTRODUCTION

The global prevalence of chronic energy deficiency (CED) in third trimester pregnancy is 35-75%..

METHODE

The method of research was literature review based on national and international scientific journals on the evaluation of supplementary feeding of mung bean biscuits in pregnant women with chronic energy deficiency. Publications between 2019-2024 on PubMed, Google Scholar, and Semantic databases using Indonesian English keywords. “chronic energy deficiency” in pregnancy”,“mung beans”, “vigna radiata”, There were 105 articles identified. Furthermore, screening was carried out to get 68 articles, then selected abstracts, full text, open access and type of research obtained 40 eligibility articles. The final process is to read and select eligibility articles based on the criteria obtained 30 relevant articles consisting of 5 international articles and 25 national articles.

RESULT

The literature search results obtained thirty literature related to the evaluation of mung bean biscuit supplementation in chronic energy deficiency pregnant women. The result of the literature search found that the supplementary feeding programme for chronic energy deficiency pregnant women can overcome the problem of chronic energy deficiency by increasing the upper arm circumference. Mung beans can be used as a basic ingredient for making local food products. Mung bean biscuits for chronic energy deficient pregnant women on labour outcomes are still very limited in the research literature.

CONCLUSION

The mung bean has complete nutrients both macro and micro nutrients needed by pregnant women who experience chronic energy deficiency. Making supplementary food with mung beans is proven to help improve the nutritional status of chronic energy deficiency pregnant women.

Keywords: *Complementary feeding, mung beans, chronic energy deficiency, labour outcomes*

1. INTRODUCTION

Pregnancy leads to increased energy metabolism. This increase in energy and nutrients is needed for the growth and development of the foetus, the increase in the size of the womb organs, and changes in the mother's body composition and metabolism, so a lack of certain nutrients needed during pregnancy can cause the foetus to grow incompletely Carolin et al, 2022). The pregnant woman is at risk of developing chronic energy deficiency if her nutritional needs are not met due to increased nutrient requirements. The World Health Organization (WHO) reports that the prevalence of Chronic Energy Deficiency (CED) in pregnancy globally is 35-75%, which is significantly higher in the third trimester compared to the first

and second trimesters of pregnancy. WHO also notes that 40% of maternal deaths in developing countries are related to chronic energy deficiency(Fatmawati *et al*, 2023). The incidences of chronic energy deficiency in developing countries such as Bangladesh, India, Indonesia, Myanmar, Nepal, Sri Lanka and Thailand are 15-47% with Body Mass Index (BMI) <18.5. The country with the highest incidence is Bangladesh at 47%, while Indonesia ranks fourth largest with a prevalence of 35.5% and Thailand with a prevalence of 15.25%. (Paradisa *et al*, 2020). Based on the Basic Health Research (Riskesdas) in 2018, 17.3% of pregnant women aged 15-49 years suffer from Chronic Energy Deficiency (Kemenkes, R.I 2018).

Under-nutrition is still a major problem in Indonesian society. One of the problems of malnutrition in pregnant women in Indonesia is Chronic Energy Deficiency (CHD) (Rohmah, 2020). Sufficient nutritional intake in pregnant women can be seen from the nutritional status of pregnant women, one of which can be described by the size of the upper arm circumference (UAC). The risk of chronic energy deficiency (CHD) can be prevented by maintaining the nutritional status of pregnant women with a UAC of not less than 23.5 cm (Krisna Putri, *et al*, 2019). The chronic lack of energy is a condition in which the mother suffers from a chronic lack of food that results in health problems in the mother. Pregnancy is an important period of 1000 The first day of life requires special attention. Pregnant women are one of the nutritionally vulnerable groups. Inadequate energy and protein intake in pregnant women can cause Chronic Energy Deficiency (CED).(Kemenkes RI, 2018). The Chronic Energy Deficiency (CED) is a condition of energy and protein deficiency in pregnant women that lasts for a long time (chronic) which results in mothers experiencing health problems characterized by upper arm circumference < 23.5 cm and mothers appear thin and are at risk of giving birth to children with Intra Uterine Growth Retardation (IUGR), Low Birth Weight (LBW) and stunting (Simbolon, D, 2019).

Incidence of chronic energy deficiency (CED) in pregnant women can be prevented by supplementary feeding (PMT). supplementary feeding is intended to be based on local food ingredients with a typical regional menu that is adjusted to local conditions. supplementary feeding given to pregnant women in this case is only for additional food or snacks, when pregnant women have no appetite then supplementary feeding becomes an alternative to fulfil the nutrition of pregnant women, in the first trimester PMT consumed is 2 pieces/day, while in trimester II and III PMT consumed 3 pieces / day. Supplementary feeding given to pregnant women according to the Minister of Health Regulation Number 51 of 2016 concerning Product Standards for Nutritional Supplementation is a biscuit containing protein, Linoleic acid, carbohydrates and enriched with 11 vitamins and 7 minerals, in this case only for additional food or snacks, when pregnant women have no appetite, supplementary feeding becomes an alternative to fulfil the nutrition of pregnant women, in first trimester PMT consumed was 2 pieces/day, while in second and third trimester 3 pieces/day (Kemenkes RI, 2017). The diversity of local foods around pregnant women can be consumed to fulfil their nutritional needs during pregnancy. Usually, local products are easier to find and more affordable in terms of cost and availability of ingredients, such as local mung beans. Mung beans are rich in macro-nutrients, micro-nutrients, vitamins B1, B2, Amino acids, Folic acid, Protein, Carbohydrates, Ca and Phosphorus. They have several benefits for pregnant women, namely reducing disability from folic acid, maintaining health from vitamin C, strengthening bones from phosphorus content, overcoming digestive problems from fibre content, reducing morning sickness, and a source of calories. Mung beans have a complete protein content of 22% so that it can help the formation of body cells and growth so that it can increase body weight. They provide unsaturated fatty acids. In addition to protein, fat, and minerals such as calcium and phosphorus, mung beans also contain vitamin B1 which is beneficial for growth. (Khasanah *et al*, 2020).

The aim of the study was to analyse the evaluation of supplementary feeding of mung bean biscuits to pregnant women with chronic energy deficiency on delivery outcomes.

2. METHOD

The literature review research method is based on national and international scientific journals on the evaluation of supplementary feeding of mung bean biscuits in CED pregnant women. Publications between 2019-2024 on PubMed, Google Scholar, and Semantic databases using the keywords ‘CED in pregnancy’, ‘mung beans’, ‘vigna radiata’. There were 105 articles identified. Furthermore, screening was carried out to get 68 articles, then selected abstracts, full text, open access and type of research obtained 40 eligibilite articles. The final process is to read and select eligibility articles based on the criteria obtained 30 relevant articles. (Figure.1). Articles are evaluated based on:

- **Inclution Criteria**
  - a.Article discusses the education of adolescents on the handling of stunting
  - b. Year of publication 2019-2024
  - c. The article uses English and Indonesian
  - d. Original article, abstract, full text and open access
- **Exclusion Criteria**
  - a.Literature review research type
  - b.Publication in community service journals

The Strategi for article dsearch can be seen in figure .

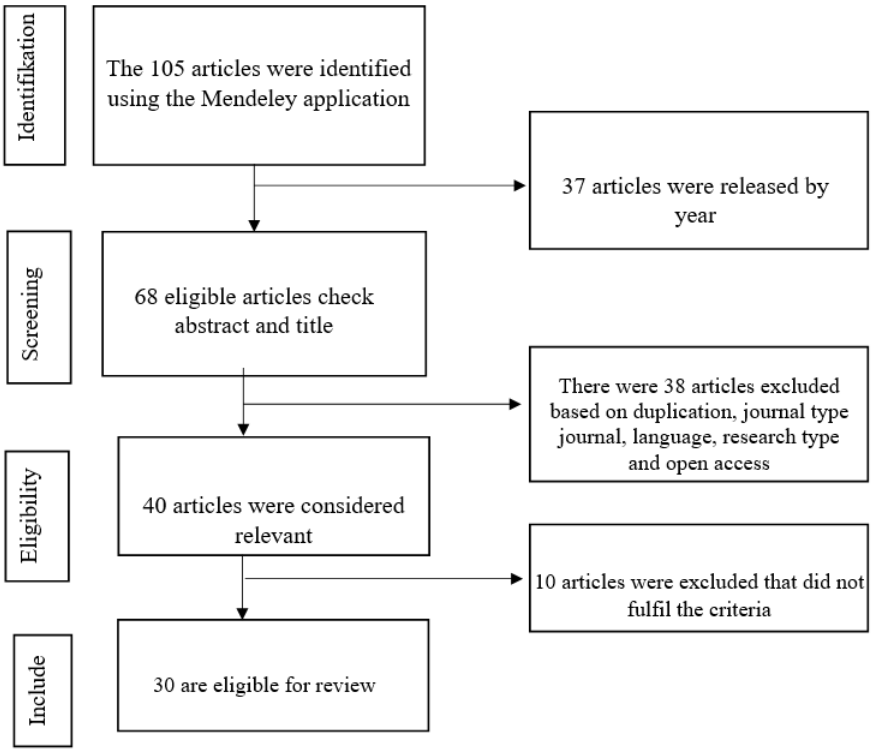

Figure 1. Article Search Flow Chart

3. RESULT

No	Author	Title	Design	Sample	Data Analysis	Result
1	Wahyuni, R., Siti R dan Juwita D.A /2022	The relationship between chronic energy deficiency and the incidence of low birth weight babies Low Birth Weight Infants (LBW) in Independent Midwife Practices (Pmb) Desti Mayasari Pekon Kedaung Pardasuka District Year 2022	Cross-sectional Study	59 Inpartu	*Chi Square*	There were 14 (23.7%) pregnant women who experienced SEZ during early pregnancy and 6 (10.2%) LBW cases. LBW cases were 6 babies (10.2%). There is a significant relationship between Chronic Energy Deficiency Chronic Energy Deficiency (SEF) in pregnant women and the incidence of LBW (P-Value=0.000).
2	Fitriana, Dhito D.P.,Rahmawati/	The Evaluation of Supplementary	Mix method qualitative and	5 pregnant woman	Wilcoxon Rank Test	There were differences in LiLa

	2020	Feeding Programme Recovery Programme (PMT-P) of Cooked Food Made from Local Ingredients for pregnant women	quantitative	with chronic energy deficiency		before and after the provision of local food supplementation in chronic energy deficiency pregnant women with p = 0.039. Results at the input, process and output stages. after getting the provision of additional food to pregnant women with chronic energy deficiency there is an increase in upper arm circumference averaged 1.5 cm, with the shortest changes in the circumference of the shortest upper arm by 1 cm and the longest by 1 cm.3cm.
3	Septiana, W., Ika A.H., Istiqamah, Ika M.U/2023	The Evaluation of Supplementary Feeding Programme for Pregnant Women with chronic energy deficiency at Puskesmas Martapura 1	Deskriptif	122 Ibu hamil dengan KEK	Frequency distributions	provision of supplementary food in pregnant women can reduce the occurrence of chronic energy deficiency by increasing upper arm circumference in pregnant women with chronic energy deficiency
4	Rohmah/2020	Additional Feeding Programme for Energy Deficient Pregnant Women Chronic	Case study	Pregnant Women with Energy Deficient Chronic	Frequency distributions	The findings showed that in terms of In terms of input, targets and human resources are not in accordance with the technical guidelines for supplementary feeding. In terms of process, it is appropriate but there are

						obstacles due to erratic dropping from the centre, for monitoring it is not in accordance with the technical guidelines. in accordance with the technical guidelines. In terms of output, infants of chronic energy deficient mothers who consumed supplementary feeding were born normally and did not experience LBW. normal, did not experience low birth weight babies
5	Damayanti, E., Rosmawati I dan Sulfianti A. Y. (2023)	The Influence of Supplementary Feeding on the Incidence of Chronic Energy Deficiency among pregnant women at Baito Health Centre	Rtatistic Survey with cross sectional design	166 pregnan woman	Logistic Regressio n test	Additional nutrition has an impact on the occurrence of chronic energy deficiency in pregnant women as measured by an effect coefficient of 4.911. pregnant women as measured by the effect coefficient of 4.911. The exp(B) value of supplementary feeding The value of exp(B) on supplementary feeding is 136.778, meaning that the risk of not being given supplementary food to the incidence of of chronic energy deficiency in pregnant women is 13 times higher than that of supplementary feeding..

6	Pujiastuti, Herman Sudiman, Laila Ulfa (2023)	The evaluation of supplementary feeding for pregnant women with chronic energy deficiency from the Corporate Social Responsibility (CSR) programme in the working area of PuskesmasTegal Angus, Tangerang Regency, 2022	metode Mixed Methods dengan desain Sequential Explanatory Designs		Wilxocon test	The research results show that there are differences in the nutritional status of pregnant women with chronic energy deficiency seen from the upper arm circumference with a significance value of 0.000 (p <0.05).
7	Puspitasari, M., Mitra., Tin, G., Novita, R dan Zulfayeni (2021)	Additional Food Provision for Pregnant Women with Chronic Energy Deficiency At Puskesmas Karya Wanita Pekanbaru	Qualitative with fenomenology approach	5 Pregnant woman Ibu The informants consisted of 2 health cadres, 2 nutrition staff, 5 pregnant women with chronic energy deficiency, and 2 health promotion officers. health centre nutrition staff, midwives, health promotion officers 1 person each.	Descriptiv e	Despite the lack of knowledge of chronic energy deficiency among pregnant women about supplementary feeding, the attitudes of pregnant women and support from their husbands were good. pregnant women's attitudes and husband's support regarding supplementary feeding are good, compliance is still lacking, acceptance of pregnant women related to supplementary feeding is still lacking, the delivery of information during counselling needs to be improved by using digital media. The delivery of information during counselling needs to be improved by using digital media. distribution of supplementary food, the health centre staff collaborate with the

						cadres
8	Juliasari, F dan Elsa, F.A (2021)	Providing Supplementary Food Weight Gain in Pregnant Women with Chronic Energy Deficiency	Cross Sectional	36 pregnant woman	Chi Square	The results of the study obtained data that were given additional food as much as 17.9% and those who were not given as much as 82.1%. given as much as 82.1%. Respondents who experienced an increase in body weight were 98.5%. Statistical test results there is a relationship between PMT and weight gain in pregnant women with SEVERITY.
9	Retnaningtyas, E., Della, D., dan Retno, P.Y.S (2023)	Provision of supplementary foods and diet against weight gain in pregnant women with chronic energy deficiency	Research Cross sectional correlational.	Sample of 32 responden with purposive sampling	Chi Square	The results of the study of 32 responden Most of the 23 (71.9%) responden consumed additional food, most of the 23 (71.9%) responden ate regularly and the majority of 23 (71.9%) responden had weight gain body. Analysis test using Chi Square significance 0.000 < α = 0.05. There is a relationship between supplementary feeding and dietary patterns on weight gain for pregnant women with CED. Provision of additional food and

						regular eating patterns in pregnant women can prevent CED.
10	Kandari, N., Sumarni, S., Dan Rismawati, S (2021).	The analysis of Supplementary Food Biscuits on Malondialdehyde Levels Malondialdehyde Levels in Chronic Energy Deficient Pregnant Women in Pare-Pare City	True experimental pretest-posttest with control group design	There were 40 chronically energy deficient pregnant women divided into 2 groups, mothers who received supplement ary food biscuits and IFA tablets (Interventio n Group), and mothers who received IFA tablets (Control Group). biscuits and IFA tablets (Interventio n Group), and mothers who received IFA tablets (Control Group).	Paired t-test and T Independe nt test	The effect of supplementary food biscuits on malondialdehyde levels after Implementation. After implementation, the average decrease in malondialdehyde levels in the supplementary food biscuits + IFA tablets group by 5.524 nmol / ml, the IFA tablet group was 1.874 nmol / ml.
11	Pertiwi, H.W., Martini, T Dan Handayani, S.M (2021)	The Relation of Supplementary Feeding with Changes in Upper Arm Circumference of Pregnant Women with Chronic Energy Deficiency	retrospective using panel data panel data to get a more in-depth picture of to get a more in-depth picture of the success of the success of the supplementary feeding programme for	24 pregnant woman	Chi Square analysis	Supplementary feeding for 3 weeks had an effect on changes in Upper Arm Circumference size and weight gain

			chronic energy deficit pregnant women (input, process and output).			
12	Adfar, T, D, Maria, N dan Ice A (2022)	The Effectiveness of Mentoring Pregnant Women with Chronic Energy Deficiency towards improving nutritional status	Quassy experiment with one group pretest-posttest.	19 pregnant woman	Paired Sample T Test	The study results showed that there is an effectiveness of assistance for pregnant women with chronic energy deficiency (CHD) on improvement of nutritional status
13	Moediarso, B,N., Perthdyatama,S.B , Mohammad F.F *et al* (2020)	Differentiate Factors Of Pregnant Women With Chronic Energy Deficiency Occurrence In Bajulmati Village, Wongsorejo District, Banyuwangi Regency 2019	This research is research analytical observational with cross sectional research design	There are 15 pregnant women	Chi-square test and fischer exact.	There were significant differences between groups based on family income in the incidence of CED in pregnant women and previous pregnancy history in the incidence of CED in pregnant women. The level of knowledge gained after the intervention was in the form of counseling to Prevent CED significantly
14	Purwati, A. E., Sri U. A., Syamimi, Z. Amsana dan Rosidah, S (2023)	Case Study Of Pregnancy Midwife Care With Chronic Energy Deficiency (CED)	The method used in this article is a descriptive method in the form of a case study with a midwifery approach. This case study uses a descriptive-analytical method	Pregnan woman	Descriptive	The midwifery care process lasts for 6 months, with intensive assessment and monitoring of the client's condition to get good results. The formation of an understanding of the dangers of CED in pregnancy has succeeded in making the client

						comply with the consumption of the given and balanced food intake as recommended. he results of this care indicate that there is an increase in body weight and Mid Upper Arm Circumference (MUAC) in pregnant women with Chronic Energy Deficiency (CED) conditions influenced by proper midwifery care, especially in supplementary feeding and can be improved by providing correct and effective information according to client needs.
15	Robiyati, Siti, A dan Helni, A (2022)	Factors Associated with the Incidence of Chronic Energy Deficiency (CED) in Pregnant Women in the Working Area of the UPT Health Center Inpatient Banding Agung in 2021	This study uses analytical quantitative research using a cross-sectional research design	The population in the study amounted to 245 people and the number of samples was 71 respondent s	Independe nt T test	The results of the bivariate analysis were a significant relation, honor between economic status with ap value of 0.000 <0.05, knowledge with ap value of 0.009 and eating patterns with ap value of 0.000 statistically proven.
16	Harna., Rahmawati, Andi Muh A.I dan Mertien, S (2024).	Prevalence and determinant factors of Chronic Energy Deficiency (CED) in pregnant women	This study had a quantitative, cross-sectional design	The sample size in this study was 140 pregnant women using purposive sampling	Analysis was performed using the chi-square statistical test at 95% CI.	The results of this study showed that the prevalence of CED was 20,7%. There was a significant relationship between maternal age, parity, gestational age, history of infectious diseases,

						knowledge, energy, and protein adequacy and CED in pregnant women (p <0,05). There was no significant relationship between income, anemia status, fat and carbohydrate adequacy, and the occurrence of CED (p> 0,05).
17	Murniyati, dan Lili, A (2023)	The Effect of Nutrition Assistance on Behaviour ChangePemenuhan Gizi Ibu Hamil Kurang Energi Kronik (Kek)	Quasy ekserimental	32 Pregnant womani.	Mann whitney test	There were differences in the average behavioural scores before and after the mentoring programme. nutrition mentoring programme on improving nutrition behaviour was considered statistically significant. very effective.
18	Utami, A.P., Miftahul, M dan Endah R. W (2023).	Age And Parity Toward Chronic Energy Deficiency (CED) Incident Of Pregnant Mother In Puskesmas Gaji	The study used comparative analysis with a case and control approach.	The sample are 80 people consisting of 40 pregnant women with CED and 40 without CED, sample was taken by simple random sampling technique.	analyzed by testing the contingency coefficient with a significance of α <0.05.	The study showed most of the pregnant women who experienced CED (case group) occurred at the risk age and almost all of the pregnant women who did not experience CED (control group) occurred at the non-risk age. Most of the pregnant women who experienced CED (case group) and without CED (control groups) were multiparous.

19	Mukaddas, H., Salma, W.O dan I Made Cristian B (2021)	Factors Related to Chronic Energy Deficiency in Pregnant Mothers in the Konawe District, Indonesia	This cross-sectional	115 pregnant women referred to two health centers in the Konawe District	Chi Square	The prevalence of CED was significantly associated with family income (P=0.001), nutritional status (P=0.001), adherence to Fe tablet consumption (P=0.007) and food availability (P=0.002). The logistic regression test showed that family income had the strongest association with the prevalence of CED (OR=2.197; 95% CI: 1,248-3.868). The prevalence of CED is higher in pregnant women with low income, poor nutritional status, and limited access to food and poor adherence to Fe tablet consumption.
20	Jayadi, Y. I., Syamsiah A, dan Titah N.L.T (2024)	Evaluation of the Supplementary Feeding Program for Pregnant Women in Preventing Stunting at Pattalassang Health Centre in Covid-19	Qualitative design	There were 10 informants consisting of two nutritionists at the Pattalassang Health Centre, two posyandu midwives, three posyandu cadres, and three pregnant women. Pattalassang Community Health Centre, two posyandu	Deskriptif	The implementation of the PMT programme generally went quite well. On input indicators, it was found that the implementation of the supplementary feeding programme at Pattalassang Health Centre is still constrained by quality and quantity of nutrition personnel. The rest, related to availability of facilities, funds and materials is generally adequate. Regarding the

				midwives, three posyandu cadres, and three pregnant women who had one of whom experienced chronic energy deficiency		process indicators, the implementation can be considered good. seeing that the distribution of supplementary food for pregnant women has been carefully considered. the distribution of supplementary feeding programme for pregnant women has been carefully considered. As for the output indicators, the evaluation of the monitoring process monitoring process still needs to be improved. Based on the evaluation results, improvements are still needed in efforts to fulfil the quality and quantity of human resources as well as in the implementation of recording and reporting. human resources and in the implementation of recording and reporting.
21	Fatmawati, Petrus, Jusuf K dan Ellyani, A (2023)	Nutritional Addition ToIncreasing The Weight Of Pregnant Women With Chronic Energy Deficiency In The Coastal Area Of Kendari City	This type of research is a quasi-experiment, two group pretest-posttestdesign with control.	The sample was pregnant women in the coastal area of Kendari City, 35 cases and 35 controls using purposive sampling.	Mann Whitney test	The average body weight of the intervention group before nutritional assistance was 50.95 kg and after assistance was 57.86 cm. Meanwhile, the average weight of the control group was 62.67 kg and after assistance it was 71.09 kg. The results of the Mann

						Whitney test obtained a p value of 0.000, so there is an influence of nutritional assistance on the weight of pregnant women.
22	Fauziana, S., dan Adhila, F. (2020)	The Relationship of Knowledge, Food Diversity, and Macro-Micro Nutrition Intake to Chronic Energy Deficiency in Pregnant Women	Cross sectional	71 pregnant woman	Correlate spearman test	There were relationships between knowledge, food diversity and energy and protein intake. There was no association between intake of carbohydrate, fat, vitamin C, folic acid, fe, calcium and iodine on chronic energy deficiency in pregnant women.
23	Afrianti dan Resi, G (2023)	Analyses of the Influence of Adolescent Age on the Incidence of Chronic Energy Deficiency in Pregnant Women at Posyandu Flamboyan	Cross sectional design	40 pregnant woman	Chi Square test	The relationship between adolescent age and the incidence of chronic energy deficiency among pregnant women at Posyandu Flamboyan in 2023.
24	Khasanah, N. S., Dhita A.O dan Intan, N/2020	The effects of mung bean extract administration on increasing the upper arm circumference of pregnant women at wilayah Puskesmas Gubug 1 Grobogan Regency	Experiment one grup pretest post test	Pergnan womaan with chronic energy deficiency	Paired t-test	There were differences in upper arm circumference before and after mung bean feeding
25	Santi, Masrin, Murlan, dan Verawati (2023)	The effectiveness of supplementary feeding programme in the form of Biscuits on the Nutritional Status of Pregnant Women in the Puskesmas Working Area	Quasy experimental one group before and after design.	31 pregnant woman	Paired samples T-test CI 95%	There was an effect of of supplementary feeding with biscuits on the nutritional status of pregnant women with with chronic energy deficiency

		Nambo Year 2022				in the Nambo Health Centre working area.
26	Setiyowati, N., dan Yuliana N.S.U (2019)	The influence of supplementary feeding of Sandwich Biscuits on Chronic Energy Deficiency of Pregnant Women at Bantarbolang Health Centre, Pemalang Regency	Quasy eksperiment one group pre posttest design	29 pregnant woman trimester II	Wilcoxon test	The result of univariate analysis of mean upper arm circumference before giving sandwich biscuits was 21.879 cm ± 1.286 cm and the average LiLA given additional food was 22.4 cm ± 1.31 cm. The provision of additional sandwich biscuits further improved the nutritional status of chronic energy deficiency of pregnant women
27	Sairuroh, Mohammad Zen Rahfiludin dan Martha I. K (2019)	The Impact of Biscuit Feeding to Pregnant Women at Risk of Chronic Energy Deficiency on Haemoglobin Levels	Quasy eksperiment.	There were 51 pregnant women at risk of Upper Arm Circumference < 23.5cm from poor families (treatment) who received supplementary feeding and 51 pregnant women at risk of chronic energy deficiency from non-poor families as controls.	Analysis of bivariate with independent sample T- test, Mann Whitney, Chi square, multivariate analysis with General Linear Model.	PMT biskuit pada ibu hamil berisiko KEK meningkatkan kadar Hemoglobin pada saat akan melahirkan.
28	Alhasany, N.F., Linda Yanti, dan Surtiningsih/2022	Greens formula for increasing the upper arm circumference of pregnant women	Case study	Pregnan woman with chronic energy	Antenatal care using the SOAP method (Subjectiv	The mung beans given to pregnant women for 21 days resulted in an increase in upper

		with chronic energy deficiency		deficiency	e, Objective, Analysis, Managem ent)	arm circumference by by 0.7 cm and body weight by 0.6kg.
29	Rofiah, M.., Maryam, R., dan Suwita I, K	Substitutions of mung bean (Vigna radiata) flour and tuna fish flour as pregnant women PMT biscuits (Thunnus sp) as biscuits for supplementary feeding of pregnant women on proximate proximate, energy value, iron content, and organoleptic quality.	The research design was a laboratory experiment Completely Randomised Design (CRD) using 3 levels of treatment, totalling 9 experimental units. experiment. Treatment level P1 with the proportion of wheat flour: mung bean flour: tuna flour (75:15:10), P2 (65:29:6), and P3 (55:41:4).	Green bean flour (Vigna radiata) and tuna fish meal (Thunnus sp.)	Proximat Analysis and organolept ic	The substitution of mung bean flour and tuna fish meal gave a significant significant effect on moisture content, ash content, protein content, fat content, iron content, biscuit aroma. However, it did not have a significant effect on carbohydrate content, colour, taste, and texture. Treatment level P2 is the the best treatment
30	Duda, R., Yoyanda, B dan Lisna, A (2023)	Substitution of Green Bean Sprout Flour (Phaseolus radiatus L) in an Effort to Increase the Nutritional Value of Wapili (Waffle) Products	The single factor completely randomised design (CRD), with 5 treatments: P0 (100% wheat flour :0% mung bean sprout flour), P1 (90% wheat flour :10% mung bean sprout flour), P2 (80% wheat flour :20% mung bean sprout flour), P3 (70% wheat flour :30% mung bean sprout flour), and P4 (60% wheat flour :40% mung bean sprout flour).		ANOVA test, Duncan Multiple Rangetest (DMRT) CI= 95% α=0,05 y	The results showed that P4 (40% mung bean sprout flour) was the treatment that produced the highest proximate components as well as antioxidant activity and preferred organoleptic parameters, namely protein content (15.04%), ash content (1.80%), moisture content (31.47%) and fat content (4.81%), carbohydrate content (45.80%), antioxidant activity (215.82 ppm), as well as organoleptic tests in terms of colour (like), aroma (somewhat like), taste (like) and

						texture (somewhat like).

4. DISCUSS

Chronic Energy Deficiency (CED) is a condition where a person's nutritional status is poor as a result of insufficient consumption of food sources of energy from macronutrients(Carolin et al, 2022). Moediarso, *et al* (2022). The condition of chronic energy deficiency is common among pregnant women as a result of chronically inadequate energy and protein intake. Many factors are associated with the incidence of SEZ in pregnant women including maternal age, maternal occupation, family income, history of previous pregnancies, history of chronic diseases, and maternal knowledge about nutrition on the incidence of SEZ in women.. Research of Robiyati *et al* (2022) showed the relationship between socioeconomic status, knowledge and diet with the incidence of chronic energy deficiency. Mukaddas *et al* (2021, stated that the causes of chronic energy deficiency are income and previous pregnancy history. The prevalence of chronic energy deficiency was higher among pregnant women with low income, poor nutritional status, and limited access to food and low adherence to Fe tablet consumption. Harna *et al* (2024), There were significant associations between the age of pregnant women, parity, spacing of pregnancies, history of infectious diseases, knowledge, energy and protein adequacy levels with the incidence of chronic energy deficiency in pregnant women ($p<0.05$). Utami et al (2023). Most pregnant women who experience chronic energy deficiency are at risk, i.e. <20 years old and over 35 years old.. Afrianti and Resi, G (2023), There was an association between adolescent age and the incidence of chronic energy deficiency in pregnant women at Posyandu Flamboyan in 2023. The OR value is 0.086 which means that if age increases, it will affect the chronic energy deficiency that occurs. Fauziana dan Adihla F (2020), There were relationships between knowledge, food diversity and energy and protein intake. There was a positive correlation between macronutrient intake of energy (p 0.011; r 0.3) and protein (p 0.043; r 0.241) with upper arm circumference of pregnant women. There is a positive r value, which means that the higher the energy intake, the higher the upper arm circumference of pregnant women, as well as protein. The higher the protein intake, the higher the upper arm circumference, but the strength of the relationship was low ($r < 0.5$).

The provision of supplementary food for pregnant women with chronic energy deficiency is the realisation of curative and preventive health efforts to improve the nutritional status of pregnant women, so that they give birth to children who do not have nutritional problems(Permenkes RI, 2016). Supplementation is an effort to increase nutrition for pregnant women so that their nutritional needs during pregnancy are met. Supplementing the diet of pregnant women with supplementary foods made with unique formulas and enriched with vitamins and minerals is a priority for groups that include women with chronic energy deficiency. Supplementary nutrition has an impact on the occurrence of chronic energy deficiency in pregnant women as measured by an effect coefficient of 4.911. The exp(B) value of supplementary feeding is 136.778, meaning that the risk of not supplementing with supplementary feeding on the incidence of chronic energy deficiency in pregnant women is 13 times that of supplementing with supplementary feeding(Damayanti, *et al* 2023). Average weight gain after 2 months of intervention was 6.91 kg in the intervention group and 8.42 kg in the control group. The average weight gain per week was 0.8 kg in the intervention group and 1.05 kg per week in the control group (Fatmawati et al, 2023). Result of Retnaningtyas, *et al* (2023) There were 32 people, 23 people who routinely consumed additional food and 9 people who did not routinely. Of the 23 people who regularly consumed food, 23 people (71.8%) experienced weight gain while 9 people (28.2%) did not experience weight gain. The results of this study indicate that if additional food is consumed regularly, it will be able to increase the weight of pregnant women with chronic energy deficiency status.. Penelitian Pertiwi, *et al* (2020) pProviding supplementary food for 90 days to chronically energy-deficient pregnant women can increase upper arm circumference with a mean increase of 0.5 ± 0.18 cm and a mean body weight of 5.8 ± 2.01 kg. Supplementary food for chronic energy deficiency pregnant women according to Minister of Health Regulation No. 51/2016 on Nutritional Supplementation Product Standards is a biscuit containing protein, linoleic acid, carbohydrates, and enriched with 11 vitamins and 7 minerals (Permenkes RI, 2016). Santi et al (2023), There is influence of supplementary feeding with biscuits on the nutritional status of pregnant women with chronic energy deficiency in the working area of Puskesmas Nambo, the average upper arm circumference of pregnant women before and after getting additional food in the form of biscuits is 0.5032. Based on the results of the study, it is known that the lowest increase in upper arm circumference is 0.1 cm due to poor family economic factors plus the age of pregnant women less than 20 years is a very risky pregnancy. The effects of becoming pregnant under the age of 20 include complications of childbirth and disruption of optimal growth completion due to growth spurts. Research of Juliasari dan Elsa (2021) It was found that the provision of additional food in the form of biscuits can increase the body weight of pregnant women with chronic energy deficiency, out of 36 people, 33 people experienced weight gain. The average contribution of supplementary food (biscuits) to total energy consumption was 23.44% (501.38 Kcal) ± 2.56% (53.47 Kcal), while the total protein consumption was 26.99% (18.83 grams) ± 5.8% (4.06 grams). The relationship between supplementary feeding and weight gain of chronically undernourished pregnant women exists because supplementary food in the form of biscuits is a supplementary food that contains complete nutrients in accordance with the provisions of the Government. Additional food, however, is not the main cause in increasing the weight of pregnant women. Dietary arrangements and the type of nutrients consumed are important factors to increase the weight of pregnant women. Setyowati et al (2019) in their research results

the average upper arm circumference before giving sandwich biscuits was 21.879 cm ± 1.286 cm and the average LiLA given additional food was 22.4 cm ± 1.31 cm (Kandari, *et al* (2021), the provision of biscuits to pregnant women can increase malondialdehyde levels. Malondialdehyde is a dialdehyde compound which is the end product of lipid peroxidation in the body. In this study, pregnant women who are chronically energy deficient have a greater risk factor for morbidity. Increased Malondialdehyde (MDA) levels indicate the level of stress in pregnant women. An increase in free radicals will cause oxidative stress. An increase in oxidative stress corresponds to an increase in MDA formation. Oxidative stress will cause damage and destruction of trophoblast cells which will lead to abortion and other complications. In this research, Malondialdehyde levels decreased in respondents who were given food biscuits, indicating a decrease in occupational stress in pregnant women with chronic energy deficiency. Giving additional sandwich biscuits further improves the nutritional status of pregnant women with chronic energy deficiency status. Providing additional food biscuits can increase haemoglobin levels of pregnant women with chronic energy deficiency energy adequacy and protein adequacy(Sairuroh *et al*, 2019).

Providing additional food to pregnant women with chronic energy deficiency will be successful if given assistance. Assistance is necessary to change the perspective and insight or knowledge of pregnant women to a positive direction so that it affects their attitude to be obedient in consuming additional food Murniyati, dan Lili, A (2023), TThere were differences in the average behavioural scores before and after the mentoring that were considered statistically significant. The nutrition mentoring program on improving nutrition fulfillment behaviour was considered very effective. Pregnant women who experience chronic energy deficiency when given assistance in the form of motivation, support, provision of materials can increase knowledge and attitudes so that changes in food consumption behaviour occur. The provision of assistance and health education is very necessary because based on the theory of Ebbinghaus and Boreas that humans have diminishing memories and are very prone to forgetfulness, assistance is carried out by paying attention, conveying messages, encouraging, inviting, providing thoughts / solutions, delivering services / assistance, providing advice, referring, mobilizing and cooperating Adfar *et al* (2022) The results of her study showed that pregnant women with chronic energy deficiency who are given additional food but with assistance will be very effective. The results of his research found that assistance to pregnant women with chronic energy deficiency has improved nutritional status seen from the size of the upper arm circumference. The average upper arm circumference before assistance in pregnant women with chronic energy deficiency was 21.26 cm ± 0.918 cm. The observation results in the first month showed that the average size of the upper arm circumference of the subject in the first month was 21.89 ± 0.937 cm, meaning that there was an increase in the average upper arm circumference of pregnant women by 0.63 ± 0.019 cm. Observation in the second month showed that the average size of the upper arm circumference of the subject was 22.42 ± 0.961 cm. This indicates an increase in the average upper arm circumference of pregnant women by 0.53 ± 0.024 cm. The observation of the third month also showed an increase in the subject's upper arms circumference by 1.11 ± 0.0001 cm from the previous month, so that there was an increase in the size of the subject's upper arm circumference of 2.27 ± 0.046 cm after three months of assistance. The form of assistance in this study was nutrition counselling.

The principle of supplementary feeding is carried out to fulfil the nutritional adequacy of pregnant women, the provision of supplementary food is given to pregnant women with chronic energy deficiency, namely pregnant women who have an upper arm circumference size below 23.5 cm, PMT in pregnant women is integrated with Antenatal Care (ANC) services. Each supplementary food pack for pregnant women contains 3 pieces of layered biscuits (60 grams). In the first trimester of pregnancy, 2 pieces are given per day until the pregnant woman is no longer in the category according to the upper circumference examination. In the second and third trimester of pregnancy, 3 pieces are given per day until the pregnant woman is no longer in the chronic energy deficiency category according to the upper arm circumference examination. Tracking weight gain according to the standard weight gain of pregnant women. If the weight is in accordance with the standard weight gain then consume balanced nutritious food (Kemenkes RI, 2017). The additional food given to pregnant women should use local foods that are easily available and have balanced nutritional value.

The mung bean can be used as supplementary feeding biscuits for pregnant women with SEZ. Mung bean biscuit formula can be substituted with other food ingredients to complete the nutrients. Research of Alhasani *et al* (2022), mung beans can be used as a formula to help pregnant women who have chronic energy deficiency. This formula consisted of 33 grams of mung bean extract and 25 grams of brown sugar, boiled and consumed once a day for 21 days. Weight and upper arm circumference measurements were taken every 7 days. On the first 7 days, the mother's body weight was 40.1 kg and upper arm circumference was 21.3 cm. On the second 7 days the mother's weight became 40.2 kg and upper arm circumference 21.4 cm. On the third 7 days, the mother's weight became 40.5 kg and upper arm circumference 21.7 cm. The 21-day mung bean formula intervention resulted in a weight gain of 0.6kg and a upper arm circumference of 0.7 cm. Ingredients 33 grams of mung beans contribute 107 calories plus 25 grams of brown sugar contains 94 calories so that it will add 201 calories in each serving. Pregnant women who consume mung bean extract once a day will add 201 calories of energy. Presentation of mung bean in the form of extract so that it is effective to be served because the nutrients are many / dense. Protein digestibility in raw mung beans is approximately 77% due to the presence of polyphenols (tannin) and antitrypsin which are anti-nutritional substances that make the protein easily digested, it needs to be processed by roasting, steaming and boiling. So the extract processing method makes it easy for pregnant women to consume mung beans directly (Alhasani, *et al* 2022). Research of Khasanah *et al* (2020) showed That pregnant women who experience chronic energy deficiency if given mung

bean extract can increase the size of the upper arm circumference. Before being given mung beans, the average upper arm circumference size was 21.9 cm and after being given mung beans it became 23.2 cm, a very significant increase of 1.3 cm. In pregnant women with chronic energy deficiency, the adequacy of calories in the body cannot be fulfilled. Not fulfilling the body's need for energy causes ineffective protein consumption because part of the protein nutrients consumed will be converted into energy to defeat its main function as a building substance and maintenance of body tissue cells. It was found that in order for the protein substance in the body to play its proper role, the body's need for energy should be fulfilled first. The energy needs of pregnant women per day range from 2300 calories to 2500 calories. So there is an increase of 200 calories to 300 calories compared to women before pregnant (Khasanah et al, 2020).

Pregnant women need about 2300 calories to 2500 calories every day so there is an additional 200 to 300 calories when compared to non-pregnant women. Mung beans as much as 100 grams have the content: Vitamin C 10 grams, Vitamin B1 0.46 grams, Vitamin A 157 SI, Phosphorus 319 grams, Iron 7.5 grams, Calcium 223 grams, Carbohydrates 56.8 grams, Fat 1.5 grams, Protein 22 grams, Vitamin B10, 46 grams, 15.5 grams of water (Khasanah *et al*, 2020). Rofiah *et al* (2019). It is thought that both green bean flour and fish tuna flours have relatively high protein levels, at approximately 25.14 grams per 100 grams of product. Initial statistical analysis suggests that biscuits made with these flours may be a suitable option for those seeking to increase their energy, protein and fat intake, including pregnant women who may be experiencing chronic energy deficiency.

5. CONCLUTION

Green beans has been found to be a good source of a range of nutrients, including those that are essential for both macronutrients and micronutrients. It has been suggested that consuming Green beans may be a beneficial addition to the diet of pregnant women who are experiencing chronic energy deficiency.

REFERENCES

[1] Adfar, T, D, Maria, N dan Ice A (2022). Efektivitas Pendampingan Ibu Hamil Kurang Energi Kronis Terhadap Peningkatan Status GizI. Jurnal Pangan Kesehatan dan Gizi JAKAGI, Juni 2022, 2(2): 37 – 47 e-ISSN: 2775-085X

[2] Alhasani, N. F., Linda Yanti dan Surtiningsih (2022). Formula Kacang Hijau untuk Penambahan LILA Ibu Hamil dengan Kekurangan Energi Kronik (KEK). Seminar Nasional Penelitian dan Pengabdian Kepada Masyarakat (SNPPKM)

[3] Carolin, B.T., Jenny, A.S., dan Nurpadilah (2022). Analisis Faktor Yang Berhubungan Dengan Kekurangan Energi Kronik Pada Ibu Hamil. Jurnal Kebidanan. P-ISSN : 2302-3082

[4] Damayanti, E., Rosmawati, I dan Sulfianti, A. Y (2023). Pengaruh Pemberian Makanan Tambahan Terhadap Kejadian Kek Pada Ibu Hamil Di Puskesmas Baito. Jurnal Pelita Sains Kesehatan Vol. 4, No.3, Juli, 2023

[5] Dewi, R., Evrianasari, N. and Yuviska, I.A., 2020. Kadar Hb, Lila Dan Berat Badan Ibu Saat Hamil Berisiko Terhadap Kejadian Stunting Pada Anak Usia 1-3 Tahun. Jurnal Kebidanan Malahayati, 6(1), pp.57-64.

[6] Duda, R., Yoyanda, B dan Lisna, A (2023). Substitution of Green Bean Sprout Flour (Phaseolus radiatus L) in an Effort to Increase the Nutritional Value of Wapili (Waffle) Products. Jambura Journal of Food Technology (JJFT) Volume 5 Nomor 1 Tahun 2023

[7] Fatmawati, Petrus, Jusuf, K dan Ellyani, A. 2023. Nutritional Addition To Increasing The Weight Of Pregnant Women With Chronic Energy Deficiency In The Coastal Area Of Kendari City. Indonesian Journal Of Health Sciences Research and Development. e- ISSN: 2715-4718

[8] Fauziana, S., dan Adhila, F (2020). Hubungan Pengetahuan, Keragaman Pangan, Dan Asupan Gizi Makro Mikro Terhadap KEK Pada Ibu Hamil. Binawan Student Journal (BSJ). Volume 2, Nomor 1, April 2020.

[9] Febriza, A., Hatta, M., Natzir, R., Kasim, V.N.A., Idrus, H.H., 2019. Activity of Antimicrobial Peptide; Cathelicidin, on Bacterial Infection. TOBIOCJ 13, 45–53. https://doi.org/10.2174/1874091X01913010045

[10] Febriza, A., Natzir, R., Hatta, M., Alam, G., Kasim, V.N., Idrus, H.H., n.d. Curcumin effects in inducing mRNA gene cathelidicin antimicrobial peptide in Balb/c mice infected with Salmonella typhi.

[11] Kasim, V., Hatta, M., Natzir, R., Hadju, V., Febriza, A., Idrus, H., 2020. Effects of lime (Citrus aurantifolia) peel to the expression of mRNA toll-like receptors 4 in balb/c mice-infected Salmonella typhi. J Adv Pharm Technol Res 11, 169. https://doi.org/10.4103/japtr.JAPTR_48_20

[12] Sunarno, S., Puspandari, N., Fitriana, F., Nikmah, U.A., Idrus, H.H., Panjaitan, N.S.D., 2023. Extended spectrum beta lactamase (ESBL)-producing *Escherichia coli* and *Klebsiella pneumoniae* in Indonesia and South East Asian countries: GLASS Data 2018. AIMSMICRO 9, 218–227. https://doi.org/10.3934/microbiol.2023013

[13] Fitriana, Dhito D.P., Rahmawati., 2020. Evaluasi Program Pemberian Makanan Tambahan Pemulihan (PMT-P) Makanan Matang Berbahan Lokal Pada Bumil KEK. BUNDA EDU-MIDWIFERY JOURNAL (BEMJ) p-ISSN: 26227482 dan e-ISSN: 26227487. Vol. 3 No. 1 (2020).

[14] Harna., Rahmawati, Andi Muh A.I dan Mertien, S (2024). Prevalence and determinant factors of Chronic Energy Deficiency (CED) in pregnant women. Aceh. Nutri. J. Vol: 9, No: 1, 2024

[15] Jayadi, Y. I., Syamsiah A, dan Titah N.L.T (2024). Evaluasi Program Pemberian Makanan Tambahan (PMT) pada Ibu Hamil dalam Mencegah Stunting di Puskesmas Pattalassang pada Covid-19. Ghidza: Jurnal Gizi dan Kesehatan

[16] Juita, M., Waryana, Heru S.K., 2020. Hubungan Kejadian Kurang Energi Kronis Pada Ibu Hamil Dengan Kejadian Bayi Lahir Pendek. JURNAL KESEHATAN – VOLUME 13 NOMOR 3 (2022) 549 – 557

[17] Kandari, N., Sumarni, S., Dan Rismawati, S (2021). Analisis Pemberian Biskuit Makanan Tambahan Terhadap Kadar *Malondialdehyde* Pada Ibu Hamil Kurang Energi Kronis Di Kota Pare-Pare. AN-NUR : Jurnal Kajian dan Pengembangan Kesehatan Masyarakat. Website : https.//jurnal.umj.ac.id/index.php/AN-NUR Vol.1 Nomor 2 Januari 2021 Hal. 133-140

[18] Kementerian Kesehatan. PERATURAN MENTERI KESEHATAN REPUBLIK INDONESIA NOMOR 51 TAHUN 2016 TENTANG STANDAR PRODUK SUPLEMENTASI GIZI. 2016;51

[19] Kementerian Kesehatan. Pola Pertumbuhan dan Perkembangan Bayi Prematur. 2022; Available from: https://yankes.kemkes.go.id/view_artikel/ 1710/pola-pertumbuhan-danperkembangan-bayi-prematur

[20] Kemenkes RI. Hasil Riset Kesehatan Dasar Tahun 2018. Kementrian Kesehat RI. 2018;53(9):1689±99.

[21] Kemenkes RI. (2017). Teknis Pemberian Makanan Tambahan (Balita - Ibu Hamil - Anak Sekolah).

[22] Khasanah, N. S, Octaviani D, A., dan Nugraheni I, 2020. The Effect of Green Bean Extract To Increase of Pregnant Women's Upper Arm Circumference in The Primary Health Care Center of Gubug I Grobogan Regency. Journal of Midwifery Science : Basic and Applied Research

[23] Krisna Putri, Ni Wayan Eka, A. A. N. Kusumajaya, and N. N. A. D. (2019). Faktor Individu, Faktor Lingkungan Dan Kekurangan Energi Kronis (Kek) Pada Ibu Hamil Di Puskesmas Mengw. Doctoral Dissertation, Poltekkes Denpasar.

[24] Krisdyana, B., Yanies L.I dan Laili K., 2023. Maternal Weight Gain during Pregnancy and Nutritional Status of Newborns in Pregnant Women with Chronic Energy Deficiency (KEK) in Tulungagung District. Prosiding TIN PERSAGI 2023: 155-164

[25] Maulina EET, Alma LR, Nurrochmah S., 2021.Relationship of Chronic Energy Deficiency, Birthweight and Exclusive Breastfeeding with Stunting in Kedungrejo Village, Pakis Distric Malang" in the 2nd International Scientific Meeting on Public Health and Sports (ISMoPHS 2020). KnE Life Sciences, 2021, 102–14.

[26] Moediarso, B,N., Perthdyatama,S.B, Mohammad F.F *et al* (2020). Differentiate Factors Of Pregnant Women With Chronic Energy Deficiency Occurrence In Bajulmati Village, Wongsorejo District, Banyuwangi Regency 2019. Journal of Community Medicine and Public Health Research Vol 1, No 1, June 2020

[27] Mukaddas, H., Salma, W.O dan I Made Cristian B (2021). Factors Related to Chronic Energy Deficiency in Pregnant Mothers in the Konawe District, Indonesia. Jurnal Of Research Development In Nursing and Midwifery (J Res Dev Nurs Midw)

[28] Murniyati, dan Lili, A (2023). Pengaruh Pendampingan Gizi Terhadap Perubahan Perilaku Pemenuhan Gizi Ibu Hamil KURANG ENERGI KRONIK (KEK). Jurnal Penelitian Perawat Profesional Volume 5 Nomor 4, November 2023 e-ISSN 2715-6885; p-ISSN 2714-9757

[29] Novianti., Tyan, P.U., Rifka, D.K dan Nisa, I., 2022. Efektivitas Program Pemberian Makanan Tambahan pada Ibu Hamil Kekurangan Energi Kronik di Puskesmas Cikupa, Kabupaten Tangerang. Idea Pengabdian Masyarakat ISSN (Online) 2798-3668 Volume 2, Issue 03 May 2022

[30] Pastuty, R., KM, R., & Herawati, T. 2018. Efektifitas Program Pemberian Makanan Tambahan- Pemulihan Pada Ibu Hamil Kurang Energi Kronik Di Kota Palembang. Jurnal Ilmu Kesehatan Masyarakat, 9(3): 179–188.

[31] Pastuty, R., Wilma, W., & Asmalinda, W. (2022). Penyuluhan Pemberian Makanan Tambahan Pemulihan Pada Ibu Hamil Kurang Energi Kronis di Puskesmas Sako Kota Palembang. Madaniya, 3(4), 784–790. https://doi.org/https://doi.org/10.53696/27214834. 281

[32] Pertiwi, H.W., Martini, T dan Handayani, S.M (2021. Hubungan Pemberian Makanan Tambahan (PMT) Dengan Perubahan Lingkar Lengan Atas Ibu Hamil Kekurangan Energi Kronik (KEK). Jurnal Kebidanan, Vol. XII, No. 01, Juni 2020

[33] Puspitasari, M., Mitra., Tin, G., Novita, R dan Zulfayeni (2021). Pemberian Makanan Tambahan Ibu Hamil

Kek Di Puskesmas Karya Wanita Pekanbaru. Jurnal Kesehatan Manarang, Volume 7, Nomor 2, Desember 2021, pp. 141 – 153

[34] Pujiastuti, Herman Sudiman, Laila Ulfa (2023). Evaluasi Pemberian Makanan Tambahan pada Ibu Hamil dengan Kekurangan Energi Kronis (KEK) dari Program Corporate Social Responsibility (CSR) di Wilayah Kerja Puskesmas Tegal Angus Kabupaten Tangerang Tahun 2022. Jurnal Untuk Masyarakat Sehat (JUKMAS) e-ISSN : 2715-7687 Vol. 7, No. 2 Oktober 2023

[35] Purwati, A. E., Sri U. A., Syamimi, Z. Amsana dan Rosidah, S (2023). Case Study Of Pregnancy Midwife Care With Chronic Energy Deficiency (CED). GENIUS MIDWIFERY JOURNAL. ol 02. No. 01 PP 1-6 E-ISSN 2962-021X Prefix DOI: 10.56359/genmj

[36] Retnaningtyas, E., Della, D., dan Retno, P.Y.S (2023). Provision Of Supplementary Foods And Diet Against Weight Gain In Pregnant Women With Chronic Energy Deficiency. Science Midwifery, Vol 11, No. 2, June 2023

[37] Robiyati, Siti, A dan Helni, A (2022). Factors Associated with the Incidence of Chronic Energy Deficiency (CED) in Pregnant Women in the Working Area of the UPT Health Center Inpatient Banding Agung in 2021. Science Midwifery, Vol 10, No. 2, April 2022

[38] Rohmah, L. 2020. (2020). Program Pemberian Makanan Tambahan pada Ibu Hamil Kekurangan Energi Kronis. HIGEIA (Journal of Public Health Research and Development), 4(Special 4), 812–823.

[39] Santi, Masrin, Murlan, dan Verawati (2023). Efektivitas Program Pemberian Makanan Tambahan (PMT) berupa Biskuit Terhadap Status Gizi Ibu Hamil Kek di Wilayah Kerja Puskesmas Nambo Tahun 2022. Jurnal Penelitian Sains dan Kesehatan Avicenna Vol. 2 No. 1 Januari 2023 ISSN 2829-5536

[40] Septiana, W., Ika A.H., Istiqamah, Ika M.U., 2022. Evaluasi Program Pemberian Makanan Tambahan pada Ibu Hamil dengan KEK di Puskesmas Martapura 1. Attractive : Innovative Education Journal Vol. 5 No. 2, July 2023

[41] Setiyowati, N. , dan Yuliana N.S.U (2019). Pengaruh PMT Biskuit Sandwich Terhadap Ibu Hamil Kurang Energi Kronis di Puskesmas Bantarbolang Kabupaten Pemalang. Jurnal Gizi Volume 8 Nomor 1 Tahun 2019

[42] Simbolon, Demsa. 2019. Pengaruh Pendampingan Gizi Terhadap Perubahan Perilaku Pemenuhan Gizi Ibu Hamil Kurang Energi Kronik (KEK). Jurnal Kesehatan: Politeknik Kesehatan Tanjung Karang Vol. 10 No. 2 (2019)

[43] Soetjiningsih dan Ranuh IGN. 2015. Tumbuh kembang anak. Jakarta: EGC.

[44] Utami, A.P., Miftahul, M dan Endah R. W (2023). Age And Parity Toward Chronic Energy Deficiency (CED) Incident Of Pregnant Mother In Puskesmas Gaji. Int. J. Midwifery Res. Vol 3, No 2, Nov 2023

[45] Wahyuni, R., Siti R dan Juwita D.A., 2022. Hubungan Kekurangan Energi Kronik (Kek) Dengan Kejadian Bayi Berat Lahir Rendah (BBLR) Di Praktik Bidan Mandiri (Pmb) Desti Mayasari Pekon Kedaung Kecamatan Pardasuka Tahun 2022. Jurnal Maternitas Aisyah (JAMAN AISYAH. p-ISSN **2721-1770**

[46] Wulan dan Muniar, 2021. Pengaruh Pemberian Jus Kacang Hijau Dan Madu Terhadap Kadar Hemoglobin Pada Ibu Hamil. Jurnal Keperawatan dan Fisioterapi (JKF), e-ISSN 2655-0830 Vol. 3 No.2 Edisi November 2020 – April 2021

[47] Febriza, A., Hatta, M., Natzir, R., Kasim, V. N. A., & Idrus, H. H. (2019). Activity of Antimicrobial Peptide; Cathelicidin, on Bacterial Infection. *The Open Biochemistry Journal*, *13*(1), 45–53. https://doi.org/10.2174/1874091X01913010045

[48] Febriza, A., Natzir, R., Hatta, M., Alam, G., Kasim, V. N., & Idrus, H. H. (n.d.). *Curcumin effects in inducing mRNA gene cathelidicin antimicrobial peptide in Balb/c mice infected with Salmonella typhi*.

[49] Kasim, V., Hatta, M., Natzir, R., Hadju, V., Febriza, A., & Idrus, H. (2020). Effects of lime (Citrus aurantifolia) peel to the expression of mRNA toll-like receptors 4 in balb/c mice-infected Salmonella typhi. *Journal of Advanced Pharmaceutical Technology & Research*, *11*(4), 169. https://doi.org/10.4103/japtr.JAPTR_48_20

[50] Sunarno, S., Puspandari, N., Fitriana, F., Nikmah, U. A., Idrus, H. H., & Panjaitan, N. S. D. (2023). Extended spectrum beta lactamase (ESBL)-producing *Escherichia coli* and *Klebsiella pneumoniae* in Indonesia and South East Asian countries: GLASS Data 2018. *AIMS Microbiology*, *9*(2), 218–227. https://doi.org/10.3934/microbiol.2023013