



## EFFECTIVENESS OF NUTRITION EDUCATION USING NUTRITION CAKRAM AND LEAFLET METHODS IN IMPROVING ADOLESCENT FEMALE KNOWLEDGE ABOUT CHRONIC ENERGY DEFICIENCY (CED) AT SMKN 3 BENGKULU CITY

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### Abstract

Nutritional needs in adolescence increase significantly compared to childhood. Prolonged nutrient deficiencies, especially energy and protein, can result in Chronic Energy Deficiency (CED). CED is characterized by continuous inadequate energy and protein intake, which is experienced by most adolescent girls around the world, including in Indonesia. This study aims to determine the effectiveness of nutrition education using nutrition cakrams and leaflets on increasing adolescent girls' knowledge about chronic energy deficiency. This study is a quasi-experimental study before and after, with 150 adolescent girls aged 17-18 years, using a simple random sampling technique. Nutrition education was given to adolescent girls using media in the form of cakrams and leaflets. Data collection included pre-test and post-test assessments of knowledge about CED in the cakram and leaflet groups at SMKN 3 Bengkulu City in 2024. Before being given the cakrams, the average knowledge score of the cakram media group was 30.21 after being given the cakrams was 91.91. In the leaflet group, the average knowledge score before and after was 28.29 and after 51.70. Initial findings indicate that media such as cakrams can significantly increase understanding and awareness of KEK. Nutrition education using innovative media such as cakrams has been shown to be effective in increasing knowledge of KEK among adolescent girls. This is because the increase in knowledge is higher compared to the use of leaflet media

**Keywords** : Nutrition, Education, Cakrams, Leaflets, Knowledge, KEK.

Presented at The 4<sup>th</sup>  
Bengkulu International  
Conference on Health (B-  
ICON),  
Bengkulu-Indonesia,  
September 24-26<sup>th</sup>, 2024

Published: December 31<sup>st</sup>,  
2024

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ISSN : 2986-027X

## INTRODUCTION

Malnutrition is still a major public health problem, especially in developing countries, if not met it will result in nutritional problems in adolescent girls ( Khayatunnisa, 2021). Adolescents need good nutritional intake to meet their body's needs. During adolescence, the need for nutrients is the highest compared to other periods in the human life cycle.

Nutritional problems that occur need to be addressed through their causes. One of the vulnerable nutritional groups targeted by the nutritional problem management program is women of childbearing age (WUS), especially adolescent girls, because this group determines the quality of the next generation (Nadya & Fariza., 2022). The nutritional problem that is often experienced by adolescent girls is *Chronic Energy Deficiency* (CED) (Suarjana., 2020).

*Chronic Energy Deficiency* (CED) is a condition in which a person lacks nutritional intake in the form of energy and protein that lasts for quite a long time. A person is said to be at risk of CED if the percentage of LILA is 70.1-84.9%. The standard for measuring LILA can be seen from the age including 15 years (25.4 cm), 16 years (25.8 cm), 17 years (26.4 cm), 18 years (25.7 cm), and 19 years (26.5 cm) (WHO NCHS., 2000). *The World Health Organization* (WHO) noted the prevalence of CED in women aged 18-20 years in the world at 15-47%. The proportion of non-pregnant women of childbearing age aged 15-19 years who were at risk of CED in Indonesia in 2007 was 30.9% and increased to 46.6% in 2013 or an increase in prevalence of 15.7%. The prevalence of KEK risk in women of childbearing age (15-49 years) is 20.8% with the highest prevalence in adolescent women of childbearing age (15-19 years) which is 46.6%. Nationally, FMD in adolescent girls aged 15-19 years and not pregnant reaches 36.3% (Ministry of Health of the Republic of Indonesia, 2018). Adolescent girls who experience KEK are greater than normal, namely 52.4%, this figure is greater than the cases of KEK in adolescent girls from the 2018 Riskesdas, which is 38.6% (Riskesdas, 2018).

The incidence of KEK aged 15-19 years in Bengkulu City was 29.80%, the highest KEK figure in Bengkulu Province based on age characteristics (Riskesdas, 2018). KEK experienced by adolescent girls causes symptoms including anemia due to lack of iron intake, osteoporosis due to lack of calcium intake, and stunted adolescent growth due to malnutrition (Wardhani et al., 2021). Adolescents who experience KEK until the pregnancy phase have a negative impact on the fetus, such as miscarriage, stillbirth, birth defects, and low birth weight (LBW) babies (Ardi., 2021). The impacts of KEK on adolescents include suboptimal brain development, stunted physical growth, and disrupted work productivity (Ananda., 2023). There are two factors that cause KEK, namely direct factors including the amount of food intake, activity, and infectious diseases. While indirect factors include knowledge about nutrition, age, and attitude. The lack of basic knowledge is related to the level of education which will influence food choices (Mentari et al., 2022). Both of these things interfere with growth ( Hidayati et al., 2023 ). To prevent *Chronic Energy Deficiency* (CED) in adolescents, it is very important to implement a healthy and balanced diet. Adolescents need to consume various types of foods that contain complete nutrients, such as carbohydrates, proteins, fats, vitamins, and minerals. In addition, adolescents' food portions also need to be increased to meet higher energy needs, considering that they are in a period of growth and development ( Rivki et al.,

2021 ).

One of the efforts to increase knowledge about KEK in dealing with KEK problems is education that aims to change positive behavior (Azizah., 2023). Education is carried out by counseling using media, education can increase the knowledge and understanding of young women about KEK (Mahmudah et al., 2020). The media will make it easier and clearer for the audience to receive the material presented (Hartaty et al., 2022). This tool is designed to stimulate students' interest in learning and make it easier for them to understand the concepts being taught. In other words, learning media functions as a bridge between teachers and students, so that learning objectives can be achieved effectively (Pratiwi et al., 2022). The use of intervention media has been proven effective in changing individual attitudes. This shows that the media not only plays a role in increasing a person's knowledge, but can also shape their views and behavior. The development of the tool currently used is the nutrition plate. The nutrition plate consists of two sides which are used for nutrition communication, information and education (KIE) materials. Nutrition cakrams are an effective medium for health in children and adults (Lula Agustin et al., 2023). The advantage of this cakram media is that it is a new media for teenagers so they are enthusiastic about this media, both regarding content, color, and how to use it. Attractive images and colorful displays show effective results at the level of knowledge because they are easy to remember and simple (Mahmudah et al., 2020). *Leaflet media* is generally used in providing counseling in the form of paper containing images and writing about a message that is to be conveyed with the aim that the person concerned understands what will be conveyed (Maptukhah & Anita., 2023).

The results of the Bengkulu City Health Office report in 2023 found that the number of vocational schools in Bengkulu City was 363 that experienced malnutrition. The purpose of this study was to determine the effectiveness of nutrition counseling using nutrition cakrams and leaflets on increasing the knowledge of adolescent girls about KEK at SMK Negeri 3 Bengkulu City.

## **MATERIALS AND METHODS**

Research design and background: This study uses quantitative analytics with a *Quasy Experimental design* , namely a design using *Pretest-Posttest With Control Group* because this study aims to compare the results of the Pretest and Posttest. Simple *random sampling technique*.

The study was conducted in April - May 2024 at SMKN 3 Bengkulu City. The study was conducted for 1 meeting for 3 weeks. Before the study, screening was carried out on 150 female adolescents in SMKN 3 Bengkulu City. The screening results showed that 94 female adolescents had a very low level of knowledge of KEK, which was below a score of 50. In fact, most respondents had scores between 20-

40, indicating a lack of knowledge about KEK in these female adolescents. The sample in this study was obtained from 94 female adolescents who were calculated using the Slovin formula, then divided into two intervention and control groups. The intervention group was given a cakram with education while the control group was given a leaflet media without education. Ethical considerations: respondents have signed the informed consent given by the Bengkulu Health Polytechnic Research Ethics Committee and have also approved and issued a certificate of ethical compliance with the number KEPK.BKL/338/05/2024. Data analysis: The data processing stages start from coding, data entry, rechecking (cleaning). Then it is entered in the form of master data and the data is processed using the SPSS 25 application program.

## RESULTS AND DISCUSSION

The results of data collection were conducted during 1 meeting for 3 weeks. The results compare the overall knowledge score about KEK before and after the intervention and to see the increase in knowledge after being given cakram and leaflet media

*Table 1: Age and Characteristics of LILA Adolescent Girls*

Group	Variables	Category	Frequency		<i>p value</i>
			N	%	
Intervention	Age	17 years	41	87.2	0.037
		18 years	6	12.8	
	purple	malnutrition	10	21.3	
		Good Nutrition	35	74.5	
		Excessive Nutrition	2	4.3	
Control	Age	17 years	30	63.8	0.031
		18 years	17	36.2	
	purple	Malnutrition	3	6.4	
		Good Nutrition	37	78.7	
		Excessive Nutrition	7	14.9	

*Table 2: Knowledge of Young Women Before and After Education with Cakram Media and Leaflets*

Knowledge About KEK	Before	After	Delta
	Min - Max	Min - Max	X±SD
Intervention	10.00-50.00	60.00-100.00	61.7±15.64
Control	10.00-40.00	10.00-90.00	23.40±20.56

*Table 3: Increase in Knowledge of Young Women Before and After Education with Cakram Media and Leaflets*

Knowledge About KEK	Before	After	Delta X±SD	p-value
	X±SD	X±SD		
Intervention	30.21± 9.43	91.91±1 1.15	61.7±15.64	0.001
Control	28.29± 9.39	51.70±1 6.32	23.40±20.56	0.001
p- value	0.471	0.001 <sup>a</sup>		0.001 <sup>a</sup>

Analysis of Table 1 shows that the majority of subjects in the intervention group were 17 years old (87.2%), with a smaller proportion in the 18-year-old group (12.8%). A significant finding is that the percentage of subjects with the best LILA nutritional status reached 74.5% in this group. The p-value of 0.037 indicates that this difference is statistically significant. The subjects in the control group were mostly 17 years old (63.8%) and the rest were 18 years old (36.2%). Further analysis showed that 78.2% of this group had good LILA nutritional status.

Analysis of Table 2 shows that there is a significant difference in the increase in knowledge scores of KEK between the intervention and control groups. The intervention group that received education through cakram media experienced an increase in scores of 61.7, much higher than the control group with an increase of 23.40. These results indicate that cakram media is an effective educational method to increase knowledge about KEK.

Table 3 was analyzed using the Mann Whitney U Test and Wilcoxon Signed Rank Test which obtained a p value of 0.001 ( $p < 0.05$ ) which means that there is a statistically significant effect between the KEK knowledge scores before and after education. It can be concluded that the use of cakram media can have an effect and be effective in increasing knowledge about KEK in adolescent girls compared to the control group. It is possible that adolescent girls rarely get information about women's KEK.

The process of nutrition education cannot be separated from the influence of the use of teaching aids or media that support the ongoing educational activities, so that the use of appropriate media affects the reception of information (U. Mahmudah & Sari., 2021). The more five senses are used, the clearer the knowledge obtained. The findings of this study are consistent with the study of Lai Gomes Fonseca (2019) which highlights the effectiveness of visual media such as nutrition cakrams and interactive infographics in increasing student engagement and understanding of basic nutrition concepts. In addition to increasing knowledge, adolescents who participated in the intervention program also showed improvements in healthy eating behavior compared to the control group. This study proves that it

suggests the use of effective visual media in the context of nutrition education in schools (Buru et al, 2020). Another study conducted by Elina Sina (2022) stated that the use of nutrition cakram media and mobile applications can significantly increase students' understanding and knowledge of nutrition. This media utilizes attractive and interactive visualizations, so that it can attract attention and facilitate understanding of nutritional concepts that are sometimes difficult to explain with conventional methods. Thus, the nutrition cakram media not only functions as an educational tool, but also as a means of preventing nutritional problems such as malnutrition in adolescents (Profile., 2021). This study confirms that interactive media, such as cakrams, are more effective in increasing adolescent knowledge than static media such as leaflets. This finding has important implications for the development of health education strategies, especially for adolescents. By utilizing interactive media, to achieve more optimal learning outcomes.

## CONCLUSION

There is an influence of nutrition education on the knowledge of adolescent girls before and after given education nutrition using cakram media and leaflets. The use of cakram media is more effective in increasing knowledge about KEK in adolescent girls, this occurs because there is a higher increase in knowledge scores compared to use of leaflet media.

## Thank-you note

The authors would like to thank all the young women who participated in this intervention.

## Statement of Interest Expression

The author declares that he has no conflict of interest.

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