

## The Determinant of Chronic Energy Deficiency Incidence in Adolescent Girls in Ogan Komering, Ilir Regency

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### ABSTRACT

*Stunting starts from pre- conception when adolescents becomes an malnutrition and anemic mother. One problem of malnutrition in adolescents is chronic energy deficiency which will have an impact on increasing the prevalence of stunting in infants. The purpose of this study was to determine the determinant of chronic energy deficiency on adolescent girls. This study used a cross sectional design with random sampling at two schools. The results showed there was no relationship between determinant factors with the incidence of chronic energy deficiency in adolescent girls. The nutritional status of adolescents, especially the chronic energy deficiency, needs attention because young women as expectant mothers must have good nutritional status to deliver quality generations.*

**Keywords:** *chronic energy deficiency, adolescent girls*

### I. INTRODUCTION

The incidence of stunting is a main nutrition problem in Indonesia. The results of Basic Health Research (Riskesdas) in 2007 showed the prevalence of stunting in Indonesia at 36.8%. In 2010, there was a slight decline to 35.6%. However, the prevalence of stunting

increased again in 2013 to 37.2%. Based on the results of basic health research (Riskesdas) in 2018, a decline in the prevalence of stunting children in 2018 became 30.8 percent compared to 2013 (Riskesdas, 2018), but still above the threshold value <20 percent, stunting in Indonesia is still classified in public health matters.

Stunting children will experience the risk of morbidity and death, delayed motor development and stunted mental growth (Lewit, 1997; Kusharisupeni, 2002; Unicef, 2013). The quality of human resources is strongly influenced by the occurrence of stunting and will also affect the development of the nation's potential (Unicef, 2013; Unicef Indonesia, 2013). The occurrence of stunting is caused by growth faltering due to a lack of nutritional intake and has lasted a long time starting from pregnancy to 24 months (Hoffman et al, 2000; Bloem et al, 2013).

Maternal health and nutrition conditions before and during pregnancy and after delivery affect fetal growth and the risk of stunting. Other factors that affect the mother are the mother's posture (short), the distance of the pregnancy that is too close, the mother who is still a teenager, as well as the lack of nutrition during pregnancy. The condition of the mother before pregnancy both posture (body weight and height) and nutrition is one of the factors that influence stunting.

Adolescent girls as future mothers should have good nutritional status. In 2017, the percentage of short adolescent girls and very short conditions increased from the previous year, which was 7.9% very short and 27.6% short (Pusdatin Ministry of Health, Republic of Indonesia, 2018).

In terms of nutritional intake, 32% of girls in Indonesia in 2017 are at risk of having chronic energy deficiency (KEK). Around 15 provinces have percentages above the national average. If the nutrition of adolescent girls is not improved, then in the future there will be more and more expectant mothers who have short body postures and / or chronic energy deficiencies. This will have an impact on the increasing prevalence of stunting in the Indonesian (Pusdatin Ministry of Health, Republic of Indonesia, 2018).

The stunting rate in Ogan Komering Ilir Regency (OKI) of 22.6% is close to the prevalence rate in South Sumatra (PSG Pocket Book, 2017). In addition, Ogan Komering Ilir Regency is a Focus Location (LOCUS) of the National Stunting Prevention Intervention in 2019. South Sumatra, which is mostly in an area with wetland contours, means that the potential for malnutrition is increasing due to low hygiene and sanitation,

which can increase the incidence of infections in will eventually lead to wrong nutritional status. Based on the data above, that the problem of stunting needs to get more attention and one of the factors that need to be considered is the nutritional status of adolescent girls, especially the problem of chronic energy deficiency (KEK).

## II. METHOD

The study used a cross sectional design by taking a sample that is simple random sampling. Data analysis is univariate and bivariate with chi-square statistical tests. This study uses primary data and secondary data to determine the determinant of chronic energy deficiency (KEK) incidence in Adolescent in Ogan Komering Ilir Regency. This study took two schools representing urban and rural areas, that is Kayuagung SMAN I and Jejawi SMAN I. The research sample was 144 people in Kayuagung Senior High School and 143 people in Jejawi Senior High School.

## III. RESULTS

The frequency distribution of The determinants of chronic energy deficiency incidence in Adolescent girls in SMA Negeri I Kayuagung and SMAN I Jejawi in the following table :

**Tabel 1. Frequency Distribution of Adolescent Girls Characteristics**

Variable	SMAN I Kayuagung		SMAN I Jejawi	
	n	%	n	%
<b>Nutrition Status</b>				
KEK	44	30,6	87	60,8
Normal	100	69,4	56	39,0
<b>Pocket Money</b>				
< 20.000 rupiah	36	25,0	22	15,4
≥ 20.000 rupiah	108	75,0	121	84,6
<b>Teenage Knowledge Level</b>				
Not Good	41	28,5	50	34,9
Good	103	71,5	93	65,1
<b>Teenage Eating Habits</b>				
Not Good	65	45,1	53	37,1
Good	79	54,9	90	62,9

**Tabel 2. Frequency Distribution of Family Demographics**

Variable	SMAN 1 Kayuagung		SMAN 1 Jejawi	
	n	%	n	%
<b>Family Size</b>				
Big	99	68,8	55	38,5
Small	45	31,2	88	61,5
<b>Family Income</b>				
< UMR	59	41,0	142	99,3
≥ UMR	85	59,0	1	0,7
<b>Mother's employment status</b>				
Not Working	88	61,1	28	19,6
Working	56	38,9	115	80,4
<b>Mother's Education Level</b>				
Low	11	7,6	108	75,5
Medium	23	16,0	23	16,1
High	110	76,4	12	8,4

The results of the analysis found that in the data based on normal nutritional status, family size, level of knowledge, family income and mother's level of education were higher in SMA Negeri 1

Kayu Agung compared to SMA Negeri 1 Jejawi. But for data on eating habits and allowances almost the same between SMA Negeri 1 Kayuagung and SMA Negeri 1 Jejawi.

**Table 3.**  
**The Determinant Of Chronic Energy Deficiency Incidence In Adolescent Girls**

Variable	SMAN 1 Kayu Agung				p-value	SMAN 1 Jejawi				p-value
	KEK		Normal			KEK		Normal		
	n	%	n	%		n	%			
Teenage Knowledge					0,991					0,977
Not Good	12	29,3	29	12		31	62,0	19	38,0	
Good	32	31,1	71	32		56	60,2	37	39,8	
Eating Habits					0,222					0,536
Not Good	16	24,6	49	75,4		30	56,6	23	43,4	
Good	28	35,9	51	64,6		57	63,3	33	36,7	
Family Size					0,922					1,000
Big	31	31,3	68	68,7		32	60,0	33	40,0	
Small	13	28,9	32	71,1		54	61,4	34	38,6	
Pocket Money					1,000					0,596
< Rp. 20.000	11	30,6	25	69,4		15	68,2	7	31,8	
≥ Rp. 20.000	33	30,6	75	69,4		77	59,5	49	40,5	
Family Income					0,574					1,000
< UMR	16	27,1	43	72,9		86	60,6	56	39,4	
≥ UMR	28	32,9	57	67,1		1	100	0	0,0	
Mother's Employment Status					1,000					1,000
Working	17	30,4	39	69,6		17	60,7	11	39,3	
Not Working	27	30,7	61	69,3		70	60,9	45	39,1	
Mother's Education Level					0,129					0,689
Low	1	9,1	10	90,9		65	60,2	43	39,8	
Medium	6	26,1	17	73,9		15	65,2	8	34,8	
High	37	33,6	73	66,4		7	58,3	5	41,7	

## IV. DISCUSSION

### A. Family Size

Based on the distribution of family size distribution, the majority of respondents in

SMA Negeri 1 Kayu Agung live in Family Size while in SMA Negeri 1 Jejawi the majority of respondents live in small families. The factors that influence KEK in Fertile Age Women (WUS) are divided into

two, namely internal and external factors. Internal (individual) that is genetic, obstetric history, sex, etc. While external is nutrition, medicine, environment, family, and disease. Family factors include the role of husband and in-laws in nutrition and health behavior, family income, family eating habits and the amount of family members.<sup>(1,2)</sup>

The results of statistical analysis in this study reveal that there is no significant relationship between the size of the family of young women and the incidence of Chronic Energy Deficiency (KEK) both at SMAN 1 Kayu Agung and SMAN 1 Jejawi. This study is in line with research conducted by Anggraini (2018) which states that there is no relationship between family size and the incidence of Chronic Energy Deficiency (KEK) in Fertile Age Women (WUS). With the increasing number of family members, attention to meeting the nutritional needs of mothers is often ignored. Although in this study the majority of respondents' family members were less than the same as four people, meaning that the amount of children owned was only 1 or 2 people, but still meeting the nutritional needs of the mother, was still neglected.<sup>(3)</sup>

## **B. Pocket Money**

Social determinants of health, including social conditions such as social interaction, economic status, and social environment, and psychosocial factors, can directly affect one's health.<sup>(4)</sup> Economic status can be seen from family income and pocket money earned if someone is not working.

Based on the distribution of the amount of allowance, the majority of teenagers in SMA Negeri 1 Kayu Agung have an allowance of more than 20,000 rupiah per day, as well as teenagers in SMA

Negeri 1 Jejawi, most have pocket money of more than 10,000 rupiah per day. Large pocket money owned by school children determines the purchasing power of food while outside the home. The greater the amount of allowance, the higher the purchasing power of snacks that will affect the nutritional status of the child.<sup>(5)</sup>

The results of statistical analysis in this study reveal that there is no significant relationship between pocket money with the occurrence of Chronic Energy Deficiency (KEK) both at SMAN 1 Kayu Agung and SMAN 1 Jejawi. Parental income can also affect one's pocket money.<sup>(6)</sup> The higher the parent's income, the higher one's allowance will be. When the cost of buying food is limited, an individual tends to choose cheaper foods and foods that are rich in energy to make ends meet and prevent hunger.<sup>(7)</sup>

## **C. Family Income**

The economic status of a community group influences the health status of its community. Low economic status will be reflected in the health status of the community such as high mortality and morbidity, malnutrition and low accessibility to health care.<sup>(8,9)</sup> The level of community income greatly influences one's diet. In adolescents who are not yet income, family income is one of the factors that influence the purchasing power of food, thus affecting the nutritional status of the family.<sup>(10)</sup>

Based on the distribution of distribution in SMA Negeri 1 Kayuagung the majority of respondents have a large family income more than UMR South Sumatra. While at SMA Negeri 1 Jejawi almost all respondents have a large family income less than UMR South Sumatra.

Based on statistical analysis, family income does not have a significant relationship with the incidence of Chronic Energy Deficiency (KEK) in adolescent girls. This is related to many factors, one of which is related to the size of family expenses for food.<sup>(11)</sup> The totality of family income is not all used to meet food needs so indirectly income does not have a real correlation with the KEK Incidence.<sup>(12)</sup> This study is in line with research on pregnant women in Gowa District that there is no significant relationship ( $p = 0.741$ ) between Chronic Energy Deficiency (KEK) and family income.<sup>(13)</sup> Low economic rates will usually spend part of their income on food. Whereas the more money the better food is obtained because most of the income is used to buy food ingredients as desired.<sup>(14)</sup> Low expenditure has a big chance to cause KEK, this is due to the low expenditure will positively correlate with the quality of food expenditure, the lower the quantity of food expenditure causes the fulfillment of nutritional needs, especially energy and protein, the smaller.<sup>(12)</sup> The pattern of household expenditure can reflect the level of a community's life, the indicator used to measure the level of welfare is the composition of expenditure for food and non-food. Welfare is said to be good if the percentage of expenditure for food is smaller than the total food expenditure.<sup>(15)</sup>

This study is not in line with research in Sedayu Subdistrict, Bantul Regency there is a significant relationship between family income and the incidence of Chronic Energy Deficiency (KEK).<sup>(5)</sup> The cost of food is one of the obstacles in increasing the consumption of foods rich in nutrients such as whole grains, fruits, and vegetables. Food expenditure on preconception women affects the incidence of Chronic Energy Deficiency (KEK), so if spending on food is less there is a risk of Chronic Energy Deficiency (KEK).<sup>(16)</sup> High income is not necessarily followed by

high nutritional status catin, conversely with low income does not necessarily have a nutritional status that is lacking or experiencing KEK.<sup>(12)</sup>

#### **D. Mother's Employment Status**

The distribution of frequency distribution of respondents in SMA Negeri 1 Kayu Agung, the majority of them have mothers with non-working status, while in SMA Negeri 1 Jejawi the majority of respondents have working mothers. Employment can measure socioeconomic status as well as health problems and conditions where a person works.<sup>(17)</sup> Women who play a role as housewives in their lives tend to pay attention to their family's needs, including in their nutritional needs compared to women who have work and routines outside the home besides acting as housewives.<sup>(18)</sup>

The results of statistical tests in this study known that maternal employment status does not affect the incidence of Chronic Energy Deficiency (KEK) in adolescent girls. This is consistent with research conducted by Najooan who said there was no meaningful relationship between maternal work and Chronic Energy Deficiency (KEK) ( $p = 0.220$ ). This shows that even though the mother is busy working but can still meet her nutritional needs, busyness is not an inhibiting factor to meet the nutritional needs of women.<sup>(18)</sup>

#### **E. Mother's Education Level**

Distribution of respondents in SMA Negeri 1 Kayu Agung, the majority of them have mothers with higher education, while in SMA Negeri 1 Jejawi, the majority of respondents have mothers with low education. The higher level of education of mothers will have the

opportunity to influence the amount of information received, including information on health and nutrition. So that in its application, mothers with higher levels of education will care for their children with good nutrition.<sup>(19)</sup>

Based on the results of the analysis in this study it is known that there is no significant relationship between the level of education of mothers with the incidence of Chronic Energy Deficiency (KEK) in adolescent girls. This is consistent with research conducted by Kartikasari who said that there was no relationship between education with the nutritional status of pregnant women in the Bangetayu Community Health Center in Genuk Sub-District in Semarang City with the result of chi square  $p = 0.255$  (20). From the results of the study stated that good education does not necessarily have good nutritional status, this is because education is not only obtained from formal education but can also be obtained from non-formal education such as counseling on improving nutrition at local Posyandu and through various media such as in magazines and other media.<sup>(12,20)</sup> Education is one of the measures used in socioeconomic status. Education is the main thing in improving human resources. The level of education is one of the factors that can affect the quality and quantity of food, because a higher level of education is expected to have knowledge and information about nutrition, especially better food consumption.<sup>(21)</sup> In the interests of family nutrition, education is needed so that someone is more responsive to the existence of nutritional problems in the family and can take appropriate action.<sup>(22)</sup>

The results of this study are similar to those that show that there is no significant

relationship between maternal education and the incidence of Chronic Energy Deficiency (KEK).<sup>(13,20)</sup> A person with low education is not necessarily less able to compile foods that meet nutritional requirements compared to highly educated ones. Even if they are low-educated, if the person is diligent in listening to or seeing information about nutrition can affect his ability to compile nutritious food. Conversely, someone who is highly educated may not be able to compile well-nourished food because of high activity and irregular lifestyle.<sup>(13)</sup> The results of this study are not in line with research in Manado City in 2011 and South India in 2006 to 2007 which showed the result that there was a significant relationship between maternal education and the incidence of Chronic Energy Deficiency (KEK).<sup>(18,23)</sup>

## **F. Level of Knowledge about Stunting**

Knowledge is a very important factor in shaping the behavior of every individual, including the health behavior of that individual. Behavior that is based on knowledge will last longer compared to behavior that is not based on knowledge.<sup>(24)</sup> Teenage knowledge about stunting will affect adolescent food consumption patterns. The broader the knowledge of adolescents about stunting, the greater will be the understanding of adolescents about the impact and forms of prevention against stunting.

Maternal nutrition and health status in pre-pregnancy, which is when a teenage mother is one of the most critical periods for the growth and development of children. Chronic Energy Deficiency (KEK) is one of the risks of stunting. Adolescent girls are future mothers, so it is important for

adolescents to expand their knowledge of stunting so that they can prevent stunting in their babies by maintaining their nutritional status, one of which is by keeping LILA not below 23.5cm.<sup>(25-27)</sup> Based on univariate analysis, it is known that the majority of teenagers at SMAN 1 Kayu Agung and SMAN 1 Jejawi have a good level of knowledge about stunting.

Based on bivariate analysis, there is no relationship between the level of knowledge about stunting with the occurrence of Chronic Energy Deficiency (KEK) in young women at SMAN 1 Kayu Agung (p-value = 0.266) and SMAN 1 Jejawi (p-value = 0.256). This study is in line with research in Sedayu SubDistrict, Bantul Regency that there is no relationship between the level of knowledge of pregnant women with the incidence of Chronic Energy Deficiency (KEK) with a p-value of 0.892.<sup>(5)</sup> This can be influenced by the age of the respondents who can influence the amount of knowledge possessed. Research shows there is a significant relationship between age and level of knowledge (p-value = 0.001).<sup>(28)</sup> Based on research data, most respondents aged 15 to 16 years, where at this age the amount of knowledge they obtain about stunting is not extensive, so it is necessary for health workers to routinely provide education in order to improve teenage understanding of stunting because adolescence is a good age for receiving the information provided.

## G. Level of Knowledge of Balanced Diet

One cause of nutritional problems and changes in eating habits in adolescents is low nutritional knowledge and is seen in wrong eating habits. Low nutritional knowledge and practice of adolescents is reflected in deviant behavior in food-eating habits. Adolescents who have good

nutritional knowledge will be better able to choose foods according to their nutritional needs, provide supplies to adolescents how to choose healthy foods and understand that food is closely related to nutrition and health. Some nutrition and health problems during adulthood can actually be corrected during adolescence through the provision of knowledge and awareness about eating habits and healthy lifestyles.<sup>(29)</sup>

Based on research data it is known that the majority of teenagers in SMA Negeri 1 Kayu Agung and SMA N 1 Jejawi have a good level of knowledge of adolescents about balanced eating patterns. Balanced nutrition is a variety of food ingredients that contain elements of nutrients needed by the body, both quality and quantity.<sup>(30)</sup> Each food can complement each other in the nutrients it contains. The grouping of food ingredients is simplified, which is based on three main functions of nutrients, namely as a source of energy/ energy, a source of builders substances and a source of regulating substances. The energy source needed by the body is greater than the need for builders and regulators, while the need for regulators is needed in greater amounts than the builders substances.<sup>(31)</sup>

Based on the results of the analysis, it is known there is no relationship between the level of knowledge of adolescents about balanced eating patterns with the incidence of Chronic Energy Deficiency (KEK) in adolescent girls. The results of this study differ from studies conducted in Simalungun District in 2008. In this study, knowledge affected the incidence of KEK in pregnant women.<sup>(32)</sup>

## H. Eating Habits

Chronic Energy Deficiency is a condition where a person suffers from an

imbalance in nutrient intake (energy and protein) that lasts for years, especially in women of childbearing age including young women. Upper arm circumference measurements (LILA) cannot be used to monitor changes in nutritional status in the short term. Efforts to achieve good or optimal nutritional status of the community begin with the provision of adequate food. Sufficient food supply is obtained through domestic food production, namely agricultural efforts to produce staples, side dishes, vegetables, and fruits. This consumption pattern can also affect health status, where the poor consumption pattern can cause a health disorder or disease in an individual.<sup>(2)</sup> Based on the distribution of distribution in SMA Negeri 1 Kayu Agung and SMA Negeri 1 Jejawi the majority of respondents have good eating habits.

The results of statistical analysis in this study note that there is no relationship between eating habits with the incidence of Chronic Energy Deficiency (KEK) in Adolescent. Eating patterns are influenced by several things, including family eating habits, customs and culture, religion and economic level.<sup>(33,34)</sup> Counseling for adolescents is needed to provide knowledge about eating patterns and proper eating composition during the growing period. Differences in characteristics, such as the level of knowledge, education, and economic level lead to the need for counseling approaches that are more easily understood by the community.<sup>(35)</sup> Susenas data on Indonesian people's food consumption shows that in consuming food, the aspect that is considered is not only the quantity problem but also the food quality aspect. In terms of food quantity, it has been described previously that energy consumption is still slightly below that

recommended while for protein it has exceeded the provisions.<sup>(36)</sup>

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