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Analysis of Factors Affecting the Incidence of Chronic Energy Deficiency (SEZ) in Pregnant Women

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ABSTRACT

Chronic Energy Deficiency (KEK) is a condition of long-term malnutrition experienced by pregnant women and has an impact on maternal health and fetal development. In Gorontalo Province, the incidence of SEZ is still quite high, especially in the Limboto Health Center area, there are 199 cases of pregnant women who experience SEZ Incidents. The purpose of this study is to analyze the factors that affect the incidence of Chronic Energy Deficiency (SEZ) in pregnant women at the Limboto Health Center. This study uses a quantitative approach with a cross-sectional design. The sample totaled 288 pregnant women who were selected using purposive sampling techniques. Data was obtained through medical records and analyzed using the Chi-square test. The results showed that the variables of parity (p=0.000), anemia (p=0.000), and ejaculation (p=0.000) had a significant effect on the incidence of Chronic Energy Deficiency (KEK) in pregnant women. Meanwhile, age (p=0.070) and education (p=0.708) did not show a significant effect on the incidence of chronic energy deficiency (SEZ). Parity, anemia, employment, affect SEZ, while age and education have no effect.

Keywords: ***Anemia, Education, Employment, Parity, age, SEZ***

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INTRODUCTION

Chronic Energy Deficiency (SEZ) is a condition in which a person experiences an imbalance in nutritional intake, especially energy and protein, which lasts for a long time. A person is considered at risk of developing a SEZ if the Upper Arm Circumference (LILA) is less than 23.5 cm. LILA is a method to assess the risk of chronic energy deficiency. However, LILA measurements cannot be used to monitor changes in nutritional status in the short term. The results of LILA measurements can be divided into two categories, namely <23.5 cm, then there is a risk of SEZs, while if the result is 23.5 cm or more, it means that there is no risk of SEZs. (Sofyawari S,2023)

According to *the World Health Organization* (WHO) reported that the prevalence of chronic energy deficiency (KEK) in pregnancy globally ranges from 35-75%, with the figure being significantly higher in the third trimester compared to the first and second trimesters. The WHO also notes that 40% of maternal deaths in developing countries are related to chronic energy deficiency. Pregnant women who experience nutritional problems, such as chronic energy deficiency, have a higher risk of health problems. Therefore, it is important to avoid nutritional energy deficiencies in pregnant women who are making them a group that needs special attention (Nurfadhillah et al., 2023).

Data from the Gorontalo Provincial Health Office in 2024 shows that the incidence rate of KEK in pregnant women varies between districts/cities. Boalemo Regency recorded 210 cases, Gorontalo Regency 704 cases, Pohuwato 433 cases, Bone Bolango 273 cases, North Gorontalo 286 cases, and Gorontalo City 221 cases. The results of the initial data survey conducted at the Limboto Health Center. The incidence of KEK in pregnant women is 199 pregnant women who experience Chronic Energy Deficiency (SEZ) in 2024. These figures underscore the importance of strategic steps to reduce the number of SEZ in pregnant women.

The factors that cause Chronic Energy Deficiency (SEZ) vary greatly both directly and indirectly. The direct factors are malnutrition, bleeding, eclampsia and infectious diseases, while the indirect causes are Chronic Energy Deficiency and anemia (Silfia NN et al, 2022).

The Directorate of Nutrition and Maternal and Child Health carries out various programs to reduce the number of pregnant women who deal with chronic energy deficiency (SEZ). These programs include the provision of additional food (MT) both from factories and based on local food for pregnant women in SEZs.

Besides They also ensure the availability of nutrition for pregnant women in KEK during disasters through disaster nutrition activities. Increasing the capacity of health cadres in the preparation of local MT that meets the nutritional needs of hamik SEZ mothers is also the main focus. Finally, monitoring and technical assistance for the distribution and use of factory MT and local MT are carried out periodically to ensure the effectiveness of the program.

In supporting the government's efforts, the role of midwives in reducing the number of pregnant women with chronic energy deficiency (SEZ) in the Limboto Health Center area through early examination of pregnant women, monitoring pregnant women at high risk, collecting data on problems experienced by pregnant women, and tracing high-risk pregnant women who have their pregnancies checked at the Health Center.

METHOD

The design of this study uses a quantitative research design with an approach *cross-Sectional.* This research was carried out at the Limboto Health Center. The research implementation time is from March-April 2025. The population in this study is all pregnant women in 2024 who have their pregnancy checked at the Limboto Health Center as many as 1012 pregnant women. The research sample amounted to 288 pregnant women obtained using the slovin formula. The instrument in this study uses a medical record-based checklist designed to record factors that affect SEZs. Data is processed using the stages of data checking or editing, entry, and cleaning. Data analysis was carried out in univariate and bivariate ways. Bivariate analysis using the Chi-square test. Statistical analysis techniques use statistical programs using two types of analysis, namely Univariate analysis techniques and Bivariate analysis techniques.

RESULTS AND DISCUSSION

Result

Table 1. Analysis of factors that affect the incidence of Chronic Energy Deprivation in pregnant women at the Limboto Health Center

No	Variabel	Quantity (n)	Presentase (%)
1.	**Age of Pregnant Women**		
	20-35	221	76,7
	<20 or >35	67	23,3
2.	**Paritas**		
	Nullipara & Primipara	180	62,5
	Multipara	81	28,1
	Largemultipara	27	9,4
3.	**Status Anemia**		
	No	121	42,0
	Ya	167	58,0
4.	**Education**		
	Low	97	33,7
	Tall	191	66,3
5.	**Employment Status**		
	Work	109	37,8
	Not Working	179	62,2
6.	**SEZ Incident**		
	No	144	50,0
	Ya	144	50,0
Total		288	100

Source: Primary Data 2025

Based on table 1, the majority of pregnant women are in vulnerable age 20-30 years (not at high risk), as many as 211 pregnant women (76.7%), while the remaining 67 pregnant women (23.3%) are at the age of <20 years or >35 years (high risk). Most pregnant women had a primipara parity of 180 pregnant women (62.5%), followed by multipara as many as 81 pregnant women (28.1%), and grandemultipara as many as 27 pregnant women (9.4%). A total of 167 pregnant women (58%) experienced anemia, while 121 pregnant women (42%) did not have anemia. In terms of education, the majority of pregnant women who have higher education are 191 pregnant women (66.3%) and 97 pregnant women (33.7%) are poorly educated. In terms of work, the majority of pregnant women who do not work are 179 pregnant women (62.2%) while 109 pregnant women (37.8%) are working. Meanwhile, the number of pregnant women who experienced SEZ and did not experience SEZ was 144 pregnant women each.

Table 2. The Effect of Age on the Incidence of Chronic Energy Deficiency in Pregnant Women at the Limboto Health Center

No.	Age (Years)	SEZ Incident				Total		*P-value*
		No		Ya				
		n	%	n	%	**N**	**%**	
1.	20-35	117	40,6	104	36,1	**221**	**76,7**	
2.	<20 or >35	27	9,4	40	13,9	**67**	**23,3**	**0,070**
Total		**144**	**50,0**	**144**	**50,0**	**288**	**100**	

Source: Primary Data 2025

Based on table 2, out of 221 pregnant women aged 20-30 years, 177 pregnant women (40.6%) did not experience SEZs and 104 pregnant women (36.1%) experienced SEZs. Meanwhile, of the 67 mothers aged <20 or >35 years, as many as 27 pregnant women (9.4%) did not experience SEZs and 40 pregnant women (13.4%) experienced SEZs. The *Chi-square* test showed a *p-value* = 0.070, meaning that there was no significant influence between age and the incidence of KEK (*p-value >0.05*).

Table 3. The Effect of Education on the Incidence of Chronic Energy Deficiency in Pregnant Women at the Limboto Health Center

No.	Education	SEZ Incident				Total		*P-value*
		No		Ya				
		n	%	n	%	**N**	**%**	
1.	Low	47	16,3	50	17,4	**97**	**33,7**	
2.	Tall	97	33,7	94	32,6	**191**	**66,3**	**0,708**
Total		**144**	**50,0**	**144**	**50,0**	**288**	**100**	

Source: Data Primeer 2025

Based on table 3, out of 97 pregnant women with low education, there were 50 pregnant women (17.4%) who experienced SEZs and 47 pregnant women (16.3%) did not experience SEZs. Meanwhile, of the 191 pregnant women with higher education, there were 94 pregnant women (32.6%) experienced SEZs and 97 pregnant women (33.7%) did not experience SEZs. The results of the Chi-square Test showed a value of p= 0.708, which means that there was no significant influence between education and the incidence of SEZs.

Table 4. The effect of parity on the incidence of Chronic Energy Deficiency in pregnant women at the Limboto Health Center

No.	Paritas	SEZ Incident				Total		*P-value*
		No		Ya				
		n	%	n	%	**N**	**%**	
1.	Nullipara & Primipara	68	23,6	112	38,9	**180**	**62,5**	**0,000**
2.	Multipara	53	18,4	28	9,7	**81**	**28,1**	
3.	Largemultipara	23	8,0	4	1,4	**27**	**9,4**	
	Total	**144**	**50,0**	**144**	**50,0**	**288**	**100**	

Source: Primary Data 2025

Based on table 4. Of the 180 pregnant women with Nullipara and primipara parity, 122 pregnant women (38.9%) experienced SEZs. In 81 mothers with mulipara parity, 28 pregnant women (9.7%) experienced SEZ, and of 27 mothers In the United States, there were 4 pregnant women (1.4%) experiencing KEK. The results of the Chi-square test showed that p-value = 0.000 means that there is a significant influence between parity and the incidence of SEZ.

Table 5. The effect of anemia status on the incidence of Chronic Energy Deficiency in pregnant women at the Limboto Health Center

No.	Anemia	SEZ Incident				Total		*P-value*
		No		Ya				
		n	%	n	%	**N**	**%**	
1.	No	83	28,8	38	13,2	**121**	**42,0**	**0,000**
2.	Ya	61	21,2	106	36,8	**167**	**58,0**	
	Total	**144**	**50,0**	**144**	**50,0**	**288**	**100**	

Source: Primary Data 2025

Based on table 5, out of 121 pregnant women who were not anemic, there were 38 pregnant women (13.2%) experiencing SEZ. Meanwhile, of the 167 pregnant women who experienced anemia, 106 pregnant women (36.8%) experienced SEZs. The results of the Chi-square shows p-value = 0.000 which means that there is a significant influence between anemia and the incidence of KEK.

Table 6. The Effect of Work on the Incidence of Chronic Energy Deficiency in Pregnant Women at the Limboto Health Center

No.	Employment Status	SEZ Incident				Total		*P-value*
		No		Ya				
		n	%	n	%	**N**	**%**	
1.	Work	76	26,4	33	11,5	**109**	**37,8**	
2.	Not Working	68	23,6	111	38,5	**179**	**62,2**	**0,000**
	Total	**144**	**50,0**	**144**	**50,0**	**288**	**100**	

Sumber: Data Primer 2025

Based on table 14 above, a cross-tabulation between employment status and SEZ incidence was obtained. Of the 109 working pregnant women, there were 76 pregnant women (26.4%) who did not experience SEZ and 33 pregnant women (11.5%) who experienced SEZ events. Meanwhile, of the 179 pregnant women who did not work, there were 68 pregnant women (23.6%) who did not experience KEK and 111 pregnant women (38.5%) who experienced KEK events. From the *chi-square test, a* p-value of 0.000 *was obtained* . This shows that there is a significant influence between employment status and the incidence of SEZs (*p-value<0.05).*

DISCUSSION

The effect of age on the incidence of Chronic Energy Deficiency (SEZ) in pregnant women.

There is no effect of age on the incidence of Chronic Energy Deficiency in pregnant women. The results of this study are in line with the theory, that being vulnerable at the age of 20 to 30 years is the ideal period to have a healthy and quality pregnancy (Irwana et al, 2024). Young pregnant women may need a lot of energy for their own growth, so the nutritional intake for the fetus becomes less than optimal. On the other hand, older pregnant women may experience a decrease in energy, so they need more energy for daily activities. However, KEK can also occur in pregnant women who are in vulnerable reproductive age of 20-30 years (Sri Lestari D et al, 2023).

According to Fitri et al., (2022) revealed that there are pregnant women with high risk age who do not experience SEZs. On the other hand, SEZ are also found in pregnant women who are vulnerable to healthy reproductive age (20-35 years).

This condition shows that age is not the only factor that affects the incidence of SEZs. Other factors such as low nutritional awareness, too close pregnancy distance, poor economic conditions, and direct factors and infections also play a role. In other words, pregnant women who are in healthy reproductive age still have the potential to experience SEZs if exposed to these factors.

This research is not in line with the research conducted by Marjan et al., (2021) entitled "Analysis of determinants of factors related to the incidence of chronic energy deficiency (SEZ) in pregnant women in the Gunung Sindur Area, Bogor". The results of the study showed that the p-value = 0.009 which means that there is an influence of age on the incidence of SEZs.

According to the researcher's assumption, although no statistical relationship was found between age and the incidence of KEK, the age of 20-35 years is considered to be as an ideal period to have a healthy and quality pregnancy, so that it can reduce the risk of complications that may occur during pregnancy. Phenomena in the field show that many cases of SEZ are found at the ideal age (20-35 years), the results of the analysis show that age does not have a significant effect due to other influencing factors.

The effect of education on the incidence of Chronic Energy Deficiency (SEZ) in pregnant women.

There was no significant influence between education and the incidence of Chronic Energy Deficiency in pregnant women. This research is in line with research conducted by Nur'aini et al., (2021) which showed that the education factor had no meaningful influence between education and the incidence of KEK in pregnant women.

This research is not in line with the research conducted by Lucas, A. O., & Willis, (2020) stating that education has an effect on the incidence of KEK in pregnant women.

A high level of education is not always in line with the level of knowledge about nutrition not only obtained through formal education, but can also be obtained from various other sources such as electronic media, counseling activities. Education level has no direct influence on the incidence of Chronic Energy Deficiency (SEZ) in pregnant women (Sri Lestari D et al, 2023). Formal education of mothers is often positively related to the formation of food consumption patterns in the family. The higher the level of mother's education, the better her understanding of nutrition, so that the selection of the type and amount of food consumed becomes more

planned and according to the nutritional needs of the mother (10).

According to the researchers' assumption in the research that has been carried out, the level of education does not have a meaningful influence on the incidence of SEZs. Even though descriptively, pregnant women with higher education experience more SEZs. This can happen because formal education does not always reflect good nutritional knowledge or behavior. In addition, the influence of other variables such as anemia, parity, and employment can be more dominant and mask the influence of education.

The effect of parity on the incidence of Chronic Energy Deficiency (SEZ) in pregnant women.

There is an influence between parity and the incidence of Krnok Energy Shortage (SEZ) in pregnant women. According to research conducted by Sovita & Rosa, (2025) entitled "Factors related to the incidence of Chronic Energy Deficiency (SEZ) in pregnant women at the Aek Parombunan Health Center, Sibolga City". Pregnant women with primipara parity (Low) often experience SEZs due to a lack of knowledge and experience in maintaining pregnancy. KEK in the first pregnancy is also heavily influenced by psychological factors as well as mental and physical unpreparedness in facing the role of parent, which leads to a lack of attention to nutritional intake during pregnancy.

This study is the same as the research conducted by Permata Sari et al., (2023), the results of the study show that there is an effect of parity with the incidence of SEZs. This research is not in line with the research conducted by Mutika et al., (2024) entitled The relationship between determinant factors and the incidence of chronic energy deficiency (SEZ) in pregnant women in Jamali Village, Made District, Cianjur Regency. Stating that parity does not have a significant influence on the incidence of SEZ in pregnant women.

The results of a study conducted by Al Fera et al., (2025) state that the lower the risk of parity, the more few pregnant women experience Chronic Energy Deficiency (SEZ). Conversely, the higher the risk of parity, the more mothers experience SEZs.

According to researchers' assumption that parity is a factor that affects the incidence of KEK in pregnant women, low parity (primipara and multipara) can be affected by a lack of experience in managing pregnancy and proper nutritional needs compared to higher parity (largepara). This can occur due to lower skill and self-care

in pregnancy at lower parity, so the nutritional risk is less great.

The effect of anemia status on the incidence of Chronic Energy Deficiency (SEZ) in pregnant women.

There is an influence between anemia and the incidence of Chronic Energy Deficiency (KEK) in pregnant women. Anemia is a medical condition in which the number of red blood cells or the level of hemoglobin (Hb) in the blood is below normal limits. In pregnant women, anemia is one of the nutritional problems that can cause complications, both for the mother and the fetus, especially if the hemoglobin level is at 11 g/dl (Surahmi L, Kirana R, 2025).

The results of this study are the same as the results of a study conducted by Ariani et al., (2024) which show that there is an influence between age and the incidence of KEK in pregnant women.

According to Septriani & Apriyanti's theory, (2024) anemia is a condition that is often experienced by pregnant women and can have a negative impact on the mother and fetus. The most common type of anemia is iron deficiency, which is caused by a lack of iron in the body. If the iron reserve in the body is very low, a person can be in a condition close to anemia even though they have not shown symptoms clinically in laboratory tests. When these reserves are insufficient, the spinal cord is able to produce red blood cells optimally, so that hemoglobin (Hb) levels drop below normal values. If it lasts for a long time, this condition can increase the risk of infection and contribute to the occurrence of Chronic Energy Deficiency (SEZ), because the body does not get enough nutrient intake. Anemia can be a factor that affects SEZs, especially when hemoglobin levels are below normal thresholds, so the risk of anemia is even higher. Pregnant women often experience complaints in the form of fatigue, dizziness, shortness of breath, pale skin, and blurred vision. These symptoms indicate the presence of anemia, which is a condition when hemoglobin levels are lower than normal limits. In pregnant women, anemia is characterized by hemoglobin levels of less than 11 g/dL in the first and third trimester, and below 10.5 g/dL in the second trimester (Yuniarti et al, 2025)

According to the researchers' assumptions, anemia is a significant factor related to the incidence of SEZs. Anemia can occur due to a lack of iron and nutrients needed by the body, thus increasing the risk of occurrence Chronic Energy Deficiency (KEK) in pregnant women

The effect of employment status on the incidence of Chronic Energy Deficiency (SEZ) in pregnant women.

There is an influence of employment status with the incidence of SEZ in pregnant women at the Limboto Health Center. Pregnant women who do not work actually have a higher risk of experiencing SEZs, so there is an influence between employment status and the incidence of SEZs in pregnant women (Deah Oktavita, 2023).

Housewives generally bear a heavier workload, including taking care of family and household chores that are often unfinished, so pregnant women who do not work are considered more at risk. Meanwhile, working women also perform similar tasks, but they are better able to manage the burden because they get more information and support, for example from the media and the environment. In addition, the income received from work also helps to meet the needs of the family, so that the burden that must be borne is easier to overcome (Hasanah et al., 2023). SEZ are more experienced by pregnant women who do not have a job, although currently women have wider opportunities to get education and careers, those who choose to stay employed can still take care of their health, including when Doing activities at home (Riset J et al, 2023).

The results of this study are the same as the research conducted by Rusydiati et al., (2022) entitled The Relationship between Age, Employment Status and Knowledge with the Incidence of Chronic Energy Deficiency (SEZ) in Pregnant Women at the Basirih Baru Health Center, Banjarmasin City. It shows that there is an influence of employment status with the incidence of KEK in pregnant women. This study is not the same as the research conducted by Qudsiya & Ramadhani, (2022) showing that there is no significant influence between the level of maternal employment and the incidence of SEZ.

According to the researcher's assumption, work is a significant factor related to the incidence of KEK in pregnant women. Mothers who do not work are more likely to have SEZs, this can be caused by limited income and access to meet adequate and balanced nutritional needs.

CONCLUSION

This study concluded that parity, anemia, and employment have a significant influence on the incidence of KEK in pregnant women, while age and education have no effect on the incidence of KEK in pregnant women at the Limboto Health Center. Therefore, it is recommended that health workers increase counseling on the importance of nutritional fulfillment

during pregnancy, carry out early detection of anemia. As well as providing education about pregnancy planning, especially those who work or have low education, to reduce the risk of SEZs.

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