Determinants of Chronic Energy Deficiency (SEZ) of Pregnant Women in DKI Jakarta Urban The Era of Islamic Value-Based Social Development

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Abstract

The study aimed to identify the determinants of SEZ among pregnant women in the Jakarta area and formulate intervention strategies that are in line with Islamic principles. This study used data from the DKI Jakarta health information system for the period January - May 2025 with a cross sectional design involving 383 pregnant women. The analysis step formed a logistic regression biner. The results of this study showed that the variables that significantly influenced the variables of Maternal Weight ($p=<2e-16$), Maternal Height ($p=2.88e-07$) and Domicile ($p=0.0325$) significantly influenced the SEZ of pregnant women with the Odds ratio value of Domicile (1.85%), Maternal Weight (26%), Maternal TB (16.1%). Pregnant women who live in areas with high population density OR (1.85) have 84.9% times higher risk of experiencing SEZ than pregnant women who live in areas with low population density. Maternal Weight OR of (0.74) indicates that pregnant women with body weight >145cm have a lower risk of developing SEZ, meaning that the risk of SEZ decreases by 25.6%. Maternal Height OR (1.16) indicates that every increase in the height category of pregnant women was associated with a 16% increase in the risk of developing SEZ. From an Islamic perspective, efforts to maintain maternal and fetal health are an implementation of the *Maqasid Sharia* principle, namely the protection of the soul (*hifz al-nafs*) and offspring (hifz al-nasl).

Keywords: Chronic Energy Deficiency, Pregnant Women, Cities, Islamic Social Development

Article History

Introduction

As a country with the largest Muslim population in the world, Indonesia shows a close relationship between Islamic values and the dynamics of its cultural history. Conversely, the growth of local culture has also influenced the Islamic nature of the society. Rapid economic growth and increased national competitiveness have encouraged the formation of an urban class, characterized by changes in lifestyle, consumption patterns, and attention to urban health aspects. This phenomenon is evident in metropolitan cities such as Jakarta (Riza, 2020). In the context of health, attention to the condition of pregnant women is very important, especially in overcoming Chronic Energy Deficiency (SEZ) which is still a major challenge in urban areas. Inadequate energy and protein intake in pregnant women can cause SEZ. Based on WHO data, the prevalence of anemia and SEZ in pregnancy globally is 35-75%. The incidence of chronic energy deficiency in developing countries such as Bangladesh, India, Myanmar, Nepal, Sri Lanka and Thailand is 15-47% (Mariyatun et al., 2023). Indonesia's 2023 SKI data on the prevalence of pregnantwomen who experience SEZ is 16.9%, while DKI Jakarta is 11.7%. (Badan Kebijakan Pembangunan Kesehatan, 2023)

The large number of cases of SEZ in Indonesia can be caused by unbalanced food intake, especially because the body lacks the nutrients it needs (Yulianti, 2025). The risk of SEZ to the labor process can cause difficult and long labor, premature labor, bleeding after childbirth, and surgical delivery tends to increase, SEZ also affects fetal growth and development miscarriage, abortion, stillbirth, neonatal death, congenital defects, anemia in infants, intra partum asphyxia (death in the womb), low birth weight (LBW) (Sandjaja, 2014). In urban environments such as Jakarta, it is influenced by food intake, knowledge, and culture (Siauta, 2021). In addition, pregnant women who practice dietary restrictions due to habits and beliefs in the family (Riberu et al., 2024). In the context of urban Muslim communities, religious practices, gender roles and family structure can influence food consumption patterns. Despite living in large cities that are relatively more developed in terms of infrastructure, not all mothers have adequate access to resources that support nutritional status, which plays an important role in determining the risk of SEZ. The phenomenon of SEZ and malnutrition in pregnant women is an important issue that has a direct impact on the quality of future generations. The concept of *Maqashid Sharia* implementation can be a strong foundation for the protection of life protection (*hifdz al-nafs*), and protection of offspring *(hifdz al-nasl)* as a step to respond to the problem of SEZ asa strategic issue of the ummah, not just an individual medical problem (Huda et al., 2022).

This, the study of the development of urban Muslim communities in Jakarta needs to be considered from a health perspective, especially the nutrition of pregnant women, as part of sustainable development based on Islamic values. This study aims to identify the determinants of SEZ among pregnant women in the Jakarta area and formulate intervention strategies that are in line with Islamic principles.

Methods

This study used a cross-sectional design aimed at identifying the determinants of SEZ among Muslim pregnant women in the Jakarta area. The variables used are the dependent variable (IMT results), namely mothers with SEZ and normal, with the category SEZ= 1, and normal = 0. Independent variables (type of PMT, IMT, management, gestational age, LILA management, domicile, follow-up LILA, LILA results, follow-up IMT, health facility, mother's weight, number of pregnancies, mother's TB). The population of this study were pregnant women in the DKI Jakarta area who were recorded in the DKI Jakarta reporting recording system for the period January – May 2025, totaling 391 pregnant women. After obtaining 391 pregnant women, data cleaning was then carried out, by looking at the completeness of data filling so that a total sample of 383 pregnant women was obtained.

Then, an analysis was conducted using binary logistic regression with independent variables to determine the effect of various factors on SEZ status, The data presented are

descriptive and analytical. Data analysis in this study used RStudio Software and spreadsheet worksheets. The analysis steps formed a logistic regression model to obtain the value of positive and negative effects on variables. Simultaneous test was conducted to determine the effect of the independent variables used on the independent variable with a critical value for $\alpha = 0.05$ and df = number of independent variables if the value of G2> chi-square then the results are significant. Partial test to determine the significant effect of each independent variable on the independent variable. Second model test to determine significant variables and determine the best model. Identify the results of the odds ratio (the chance of an event occurring relative to the chance, the event does not occur) and its interpretation.

Results

The results of the analysis of the SEZ of pregnant women with each variable obtained in Table 1 show that IMT Management (0.859926), Domicile (0.740037), LILA Follow-up (15.213904), LILA Results (0.882745), Number of Pregnancies (0.094680), Maternal Height (0.164136) have a positive influence on the SEZ of pregnant women. Whereas Type of PMT (-0.097271), Gestational Age (-0.007449), LILA Managemen (-41.030494), IMT Follow-up (19.150422), Health Facility (-2.203659), Maternal Weight (-0.309320) have a negative effect on the SEA of pregnant women. However, these results have not been fully proven. So it is necessary to conduct simultaneous tests and partial tests to see whether each independent variable significantly affects the independent variable.

Table 1. Forming a Logistic Regression Model

(Intercept)	Type of PMT	IMT Management	Gestational Age	LILA Management
-5.998453	-0.097271	0.859926	-0.00744	-41.030494
Domicile	LILA Follow-up	LILA Results	IMT Follow-up	Health Facility
0.740037	15.213904	0.882745	19.150422	-2.203659
Maternal Weight	Number of Pregnancies	Maternal Height		
-0.30932	0.094680	0.164136		

Table 2. Simultan Test

llh	llhNull	G2	McFadden	r2ML
-142.6796765	-240.4215011	**195.4836492**	0.4065436	0.3997453

*To determine whether the independent variables in the model have an effect or not on the independent variables.

Based on the results of table 2, G2 (195.483) > chi-square table (9.488), so H0 is rejected. Because the results of the simultaneous test H0 are rejected, a partial test is carried out to find out which independent variable significantly affects the independent variable.

Table 3. Parsial Test

	Estimate	Std. Error	z value	Pr(>|z|)
(Intercept)	-5.998e+00	2.587e+03	-0.002	0.9981
Type of PMT	-9.727e-02	4.249e-01	-0.229	0.8189
IMT Management	8.599e-01	1.490e+00	0.577	0.5639
Gestational Age	-7.449e-03	1.993e-02	-0.374	0.7086
LILA Management	7.352e-01	2.891e+03	-0.014	0.9887
Domicilies	7.400e-01	3.281e-01	2.255	**0.0241 ***
LILA Follow-up	1.521e+01	2.037e+03	0.007	0.9940
LILA Result	8.827e-01	1.331e+00	0.663	0.5072
IMT Follow-up	1.915e+01	1.575e+03	0.012	0.9903
Health Facility	-2.204e+00	1.252e+00	-1.760	0.0784 .
Maternal Weight	-3.093e-01	4.616e-02	-6.701	**2.08e-11 *****
Number of pregnancy	9.468e-02	1.597e-01	0.593	0.5532
Maternal Height	1.641e-01	3.575e-02	4.592	**4.40e-06 *****

*Performed to determine whether the independent variable is significant to the model by assuming other independent variables are in the model.

Based on the results of significance far below 1%, the variables of maternal weight (p=3.58e-11) and maternal Height (p=4.63e-06) significantly affect the SEZ of pregnant women, then with a significance level of 5%, the variable Domicile (p=0.0253). While the variables of Type of PMT, (p=0.8189), IMT Management (p=0.5639), Gestational Age (p=0.7086), LILA Management (p=0.9887), LILA Follow-up (p=0.9940), LILA Result (p=0.5072), IMT Follow-up (p=0.9903), Health Facility (p=0.0784), Number of pregnancies (p=0.5532) proved to be insignificant at all affecting SEZ in pregnant women.

The existence of ten insignificant independent variables in the model certainly makes a small contribution to the analysis process, so the step that can be taken is to eliminate the independent variables from the model. For this reason, the second model was made using only the independent variables of maternal weight, maternal height, and domicile that were previously found to be significant in the model.

Table 4. Analysis of Significant Independent Variables

	Estimate	Std. Error	z value	Pr(>|z|)
(Intercept)	-9.40197	3.77767	-2.489	**0.0128 ***
Domicilies	0.61473	0.28755	2.138	**0.0325 ***
Maternal Weight	-0.29572	0.03575	-8.271	**< 2e-16 *** **
Maternal height	0.14978	0.02919	5.131	**2.88e-07 *** **

Based on the significance results far below 0.01%, the variables of maternal weight (p=<2e-16) and maternal height (p=2.88e-07) significantly affect the SEZ of pregnant women, then with a significance level of 5%, the Domicile variable (p=0.0325) also significantly affects SEZ in pregnant women. Therefore, model 2, which contains the variables of maternal weight, maternal height and domicile, is the best model for further analysis.

Table 5. Analysis of Significant Independent Variables

(Intercept)	Domicilies	Maternal Weight	Maternal height
8.256125e-05	1.849157e+00	7.439921e-01	1.161584e+00

Based on the results of the analysis in Table 5, pregnant women who live in areas with high population density have an OR (1.85) risk of 84.9% times higher risk of experiencing SEZ than pregnant women who live in areas with low population density. Maternal Weight with an OR of 0.74 indicates that pregnant women with a body weight >145cm have a lower risk of developing SEZ, meaning that the risk of SEZ decreases by 25.6%. Maternal Height with an OR of 1.16 indicates that every increase in the height category of pregnant women is associated with a 16% increase in the risk of developing SEZ.

Discussion

In this study, pregnant women living in high density urban areas had an 85.8% increased risk of experiencing SEZ. Environmental sources of vulnerability during pregnancy in urban areas, unhealthy environment (poor sanitation, air pollution) that impact on general maternal health (Brembilla et al., 2019). The importance of optimal nutrition for women before they become pregnant to minimize the risks associated with malnutrition (World Health Organization, 2012). In the Islamic perspective, as explained by *Al Syatibi*, actions that aim to prevent actual or potential imbalances that can affect physical, mental and environmental health, are part of efforts to maintain the human right to health ("Human Rights in Islam," 2004). SEZ in pregnant women is a condition of energy and protein deficiency that lasts during pregnancy and causes problems for the mother and fetus (Wati et al., 2024), so people are ordered not to harm themselves. SEZ in pregnant women can be considered a form of negligence in maintaining the trust of the body and fetus. In addition, in the context of family planning, in Islam it is referred to as the concept *(tahdid al-nasl)* of limiting offspring which is allowed as long as it is done in a way that is not permanent and does not damage health for the good of the mother, child and family.

One strategy to prevent the risk of SEZ, especially in mothers who experience pregnancies that are too frequent and too close (closely spaced pregnancies) which deplete protein energy reserves in the body, this is in line with research (Alwan, 2021) which states that pregnancy distance is a risk factor for the incidence of SEZ in pregnant women OR = 3.477 (CI 95% =

1.629 - 7.422) (Alwan, 2023). The state is obliged to provide welfare, protection and adequate health services, especially for vulnerable groups such as pregnant women (Isriawaty, 2015; Prestyana & Panjalu, 2017). Thus, the prevention of SEZ in pregnant women is not only a medical issue but also touches the spiritual, social, and structural aspects that require a joint role (individual, family, community, and state).

The weight of pregnant women with an odds ratio value (0.74) has a significant effect on SEZ, meaning that an increase in the weight of pregnant women (26%) reduces the incidence of SEZ. In line with Zhang's research (2022), states that weight gain in pregnancy is an important part of prenatal examination and is used to evaluate nutritional status during pregnancy (Zhang et al., 2022). The addition of additional food to pregnant women is part of the follow-up health program as an effort to increase the weight of pregnant women, this is in line with research conducted by Panyadi (2024), saying that there is a significant relationship in the program of providing additional food to pregnant women (Payanadi, 2024). Supplementary feeding activities (PMT) made from local food make the government's hope to encourage food self-sufficiency and sustainable family nutrition (Kemenkes RI, 2023). In the principle *of Maqasid Sharia* protection against (soul) maintaining the health of pregnant women is the task of bearing a new life, while the protection of offspring and fetuses pays attention to the nutritional quality of the child to be born, and determines the condition at birth, growth and development and intelligence in the future (Algifari & Andrini, 2024). In Islam says that it is very important to prepare a generation that is strong physically, mentally and spiritually, as the hadith says "*Al-Qur'an Q.S An-Nisa [4] verse 9*, Allah says, "Let there be fear of those who suppose (die) leaving after them, weak offspring (which) they worry about (NU Online, 2023).

Maternal height also has a significant effect (1.161) on the incidence of SEZ in pregnant women, meaning that mothers who are tall (>145cm) reduce the risk of SEZ by 16.2%. Height is one of the indicators in anthropometric measurements that are important for long-term and general maternal health potential (Murbawani et al., 2012). Mothers with optimal height tend to have better physiological capacity in undergoing pregnancy, including in terms of nutrient absorption and fetal development (Rohmawati et al., 2021). In addition, height is also an indirect indicator of socioeconomic conditions and nutritional adequacy that do not favor rapid growth in infancy and childhood and frequent infections during early life (Rohmawati et al., 2021). This makes height an important indicator in preventive approaches to SEZ, as well as in planning maternal health interventions. In the concept of *istikhlaf*, maintaining the body in a healthy, strong and optimal condition is part of one's moral responsibility (Adin, 2023). Height, which reflects a long history of nutrition and health, is one of the results of taking care of oneself for the better. Thus, prevention of SEZ through attention to factors such as height is not only a medical aspect, but also part of efforts to maintain *hifẓ al-nafs* (protection of the soul) and *hifẓ al-nasl* (protection of offspring).

However, there are limitations in this study, because the research was conducted using a cross-sectional method using data contained in the reporting system and the variables studied were limited. Thus, there is a need for mixed methods research with a quantitative village design to determine economic conditions, sanitation, and explore Islamic values.

Conclusion

This study shows that Chronic Energy Deficiency (SEZ) in pregnant women in urban areas such as DKI Jakarta is influenced by factors Domicile in densely populated areas increases the risk of SEZ due to environmental vulnerability. Maternal weight and height were shown to have a significant effect, with weight gain during pregnancy reducing the risk of SEE by 26%, and mothers with height >145 cm having a lower risk of SEE by 16.2%. Interventions through local food-based supplementary feeding programs (PMT) have been proven effective in improving the nutritional status of pregnant women and supporting family food self-sufficiency. From an Islamic perspective, efforts to maintain maternal and fetal health are an implementation of the Maqasid Syariah principle, namely the protection of the soul

(*hifẓ al-nafs*) and offspring (*hifẓ al-nasl).* SEZ on pregnant women is seen as a form of negligence in maintaining the trust of the body and fetus entrusted by Allah SWT.

The practice of family planning with regard to healthy pregnancy spacing in accordance with the concept of *tahdid al-nasl* is allowed in Islam for the safety of mothers and children. The state also has a structural responsibility to provide inclusive and equitable health services for vulnerable groups, including pregnant women. Therefore, SEZ prevention is not only the responsibility of individuals, but is a collective obligation of the family, community, and state as a tangible form of efforts to maintain the sustainability of a healthy, strong, and dignified generation, both physically and spiritually.

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