Analysis of Food Intake and Nutritional Status Among Pregnant Women in Rural Areas

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Abstract

Pregnancy is an important period for a mother to fulfil nutritional needs for herself and for the growth and development of the fetus because fetal nutrition depends on maternal nutrition, so the mother's nutritional needs must also be met. Inadequate energy and protein intake in pregnant women can cause Chronic Energy Deficiency (CED). This research aims to determine the food intake of pregnant women in Bagan Serdang Village Deli Serdang District. The sample was determined by purposive sampling, where pregnant women who became respondents were pregnant women with criteria experienced food insecurity, namely 20 people. Data on food intake was obtained using the 24-hour recall method and personal data through interviews with pregnant women. Data were analyzed by nutrisurvey tools to determine the amount of food intake. Chronic Energy Deficiency (CED) data was measured using an upper arm circumference tape. Data analysis was done descriptively to describe the food intake of pregnant women, including energy, carbohydrate, and protein intake. The results showed that 15% of pregnant women experienced Chronic Energy Deficiency (CED), and 60% of pregnant women's energy intake was still lacking. Intake of carbohydrates and protein still falls short of the nutritional requirements for pregnant women, with 55% and 75% falling into the deficient category, respectively. For pregnant women to avoid Chronic Energy Deficiency (CED), the public health center and cadres must increase their understanding of the importance of balanced nutrition during pregnancy.

Keyword: Consumption, Food intake, Food, Pregnant women

INTRODUCTION

Stunting is chronic malnutrition that results in growth failure in children under five. Shortness in this group of toddlers is one of the priority nutrition problems in the world (WHO, 2014). The problem of stunting is still a serious concern because 22.3% of children under five in the world suffer from stunting. Stunting cases in Indonesia are also in the high category, at 21.6% (SSGI, 2023). Meanwhile, at the provincial level, North Sumatera is a province with a high number of stunting at 21.1%.

Nutritional problems in Indonesia are still determinants of maternal and child mortality (Dwi, 2019). The increase in nutritional needs used to fulfil the nutrition of the mother and foetus while in the mother's stomach makes pregnant women one of the groups prone to malnutrition (Sunita Almatsier, 2018). The increase in needs during pregnancy is an increase in energy and nutrient metabolism. Food intake containing nutrients and non-nutrients during pregnancy is needed for foetal growth and development, changes in the magnitude of reproductive organs, and changes in the body composition and metabolism of pregnant women (Fitriahadi, 2018).

Pregnant women must meet nutritional needs for themselves and the growth and development of the foetus because foetal nutrition depends on maternal nutrition, so the mother's nutritional needs must also be met. Inadequate energy and protein intake in pregnant women can cause chronic energy deficiency. Pregnant women who experience severe deficiency if their upper arm circumference (LLA) is < 23.5 cm Pregnant women with severe deficiency are at risk of giving birth to low-birth-weight babies (LBW) who have the potential to experience death and impaired growth and development of the child. Chronic energy deficiency can also indirectly cause maternal death (Prabandari, 2021).

When mothers experience the risk of chronic economic deprivation during pregnancy, it will cause problems both for the mother and the foetus. Chronic economic deprivation in pregnant women can cause risks and complications for the mother, including anaemia, bleeding, not gaining weight normally, and getting infectious diseases. The effect of chronic economic deprivation on the labour process can result in difficult and long labour, premature labour, bleeding after childbirth, and surgical delivery tending to increase . Chronic economic deprivation of pregnant women can affect the process of foetal growth. It can cause miscarriage, abortion, stillbirth, neonatal death, congenital disabilities, infant anaemia, intrapartum asphyxia (death in the womb), and Low Birth Weight (LBW) (Meliati, 2020). When LBW, babies have a risk of death, malnutrition, growth disorders, and impaired child development (Amalia et al., 2021).

Deli Serdang Regency consists of coastal areas where the problem of stunting is quite high. Data states that 13.9% of children in Deli Serdang suffer from stunting (Government of Deli Serdang Regency, 2022). The Indonesian Ministry of Health (2023) explains that one of the interventions in reducing stunting is through supplementary feeding made from local food. Marine products in the form of fish, shrimp, crab, and others are local foods available in the coastal areas of Deli Serdang Regency and are a source of animal protein that can be an alternative food for pregnant women in preventing stunting in children under five.

Observations and interviews with five pregnant women in Bagan Serdang Village showed that most women consumed less energy and protein. Some of the pregnant women also have stunted children. Insufficient nutritional intake during pregnancy can result in chronic energy deficiency, which stunts the child. Deli Serdang Regency, which consists of coastal areas, has a high stunting problem. Data states that 13.9% of children in Deli Serdang suffer from stunting (Government of Deli Serdang Regency, 2022).

Food intake in pregnant women is the main factor that plays a role in their nutritional status. Assessing the nutritional status of pregnant women can be done by assessing individual

food consumption (Febry et al., 2022). Pregnant women need adequate consumption of energy and nutrients to support the growth and health of the foetus and themselves. Pregnancy causes increased energy metabolism, increasing the need for energy and other nutrients. According to Dwi (2019) 's research, there is a significant relationship between food intake and chronic energy deficiency incidence in pregnant women.

The study conducted by Abadi (2020) also supports this research, as the level of energy and carbohydrate consumption in the underweight category and protein intake were partially very deficient (91.4%), indicating that most were severely deficient in deficit fat intake (57.1%). This shows that the macronutrient intake of pregnant women with chronic energy deficiency is mostly below normal needs. Based on the description above, the authors are interested in conducting research with the title Overview of Food Intake in Pregnant Women in Bagan Serdang Village.

METHODS

This study used a descriptive research design to describe pregnant women's food intake and nutritional status in Bagan Serdang Village, Pantai Labu District, and Deli Serdang Regency. The research was conducted from August 2023 to October 2023. The population and sample were 20 pregnant women using purposive sampling, with criteria the women who became respondents were food-insecure pregnant women. The variables measured were food intake in energy, carbohydrate and protein intake, and the nutritional status of pregnant women based on upper arm circumference. Primary data was collected by measuring the respondent's upper arm circumference and conducting an interview through a 24-hour recall form guide for two days. Food intake data (energy, carbohydrate, and protein) were processed using the nutrisurvey application. Univariate data analysis was presented as descriptive tables and narrated to describe food intake in pregnant women in Bagan Serdang Village.

RESULTS

The characteristics of respondents based on age, education, occupation, gestational age, and nutritional status of pregnant women in Bagan Serdang Village are described in the following table:

Table 1. Frequency Distribution of Characteristics of Pregnant Women in Bagan Serdang Village

Mother's Characteristics	n	%
Age		
16-25 years	10	50
26-35 years	4	20
36-45 years old	6	30
Education		
Elementary school graduate	0	0
Junior high school graduate	2	10
High school graduate	18	90
Occupation		
Not working	13	65
Working	7	35
Pregnancy Age		
1st Trimester	8	40
2 ndTrimester	7	35
3rd Trimester	5	25
Nutritional Status		
No Chronic Economic Deprivation	17	85
Chronic Energo Deficiency	3	15
Total	**20**	**100**

Table 1 shows that the majority of pregnant women in Bagan Serdang Village are aged 16–25 years (50%), have a high school education (90%), most pregnant women do not work (housewives) by 65%, the gestational age is in the 1st trimester (40%), and the majority of the nutritional status of pregnant women does not experience chronic energy deficiency (85%).

Then, data on the food intake of pregnant women, including energy, carbohydrate, and protein intake, are described in the following table:

Table 2. Frequency distribution of food intake of pregnant women in Bagan Serdang Village

Food Intake	n	%
Energy Intake		
Less	12	60
Good	8	40
Carbohydrate Intake		
Less	11	55
Good	9	45
Protein Intake		
Less	15	75
Good	5	25
Total	**20**	**100**

Table 2 explains that the food intake of pregnant women in Bagan Serdang Village is still insufficient because both energy, carbohydrate, and protein intake do not meet the nutritional needs needed during pregnancy.

DISCUSSION

Energy Intake of Pregnant Women in Bagan Serdang Village

The diet of pregnant women is an important factor contributing to nutritional status. To determine the nutritional status of pregnant women. can be done by evaluating individual food intake (Persynaki et al., 2017). Pregnant women need enough energy and nutrients to support the growth and health of the foetus and themselves (Sitoayu et al., 2017). The results showed that most of the energy intake of pregnant women still did not meet their nutritional needs. Most pregnant women are still in the first trimester of pregnancy, so they still feel nausea and vomiting (hyperemesis gravidarum), reducing their appetite. This condition causes a lack of energy intake in pregnant women in Bagan Serdang Village. In line with research by Rini (2021), hyperemesis gravidarum can cause malnutrition due to insufficient energy intake, so proper nutritional management is needed. The diet for hyperemesis patients is carried out gradually and contains the composition of nutrients pregnant women need.

Inadequate energy intake will result in a lack of other nutrients, such as fat and protein, which are alternative energy sources (Sherly, 2015; Adinda, 2020). When the body lacks energy content, protein and fat will change to become energy sources, so these two substances will decrease in function. If this continues for a long time, there will be changes in body weight and damage to body tissues. Energy in the human body can arise due to the burning of carbohydrates, proteins, and fats, so humans need enough food substances to meet their energy needs (Dictara, 2018; Fatimah, 2020).

Malnutrition during pregnancy has an impact on the mother, namely maternal death, and has an impact on the foetus, including abortion and Low Birth Weight (LBW). LBW is mentioned as the main cause of infant death, is closely related to long-term morbidity, and can cause inhibition of growth and cognitive development in childhood as well as diabetes and heart disease in adulthood (Ningsih, 2021; Galgamuwa et al., 2017). The results showed that most pregnant women's energy intake (63.2%) was in the sufficient category; the rest were in the insufficient category (36.8%). The study by Tarigan (2020) showed that as many as 49% of pregnant women had an energy intake in the insufficient category, meaning that half of the pregnant women who became research samples had an energy intake of less than 90%.

National nutrition programs to reduce the risk of malnutrition in pregnant women include vitamin and mineral supplementation and supplementary feeding to prevent low birth weight (LBW) in their babies (Chunda-Liyoka et al., 2020). The implications of LBW are associated with risk factors for stunting in children (Halli et al., 2022). Research in India represents that the incidence of stunting and poor linear growth in children 0-23 months (TB/U) is significantly influenced by several factors including a history of LBW, child feeding practices that are not in accordance with nutritional needs, poor sanitation, and factors related to maternal nutritional status such as height <145 cm, pregnant women who make inappropriate food choices or consume foods that are low in both macro and micro nutrients (Aguayo & Menon, 2016).

If energy intake is inadequate, fat reserves in the body will be utilised. When fat reserves are used continuously, the protein found in the liver and muscles will be converted into energy (Damastuti et al., 2011). The upper arm circumference measurement indicates that this will result in muscle mass loss. Pregnant women need adequate nutrition to ensure nutritional fulfilment for the foetus-to-be. Therefore, it is necessary to provide balanced nutrition to prevent various pregnancy disorders, both in the mother and the foetus to be born.

Overview of Carbohydrate Intake of Pregnant Women in Bagan Serdang Village

Rice is the most common source of carbohydrates consumed by pregnant women in Bagan Serdang Village. Most of the eating habits of pregnant women in Bagan Serdang Village still depend on the staple food of rice. Although they already consume rice in each meal, with an average of 100 grammes per meal, this amount still needs to be increased because they rarely consume other sources of carbohydrates. Interview results show that they rarely consume other sources of carbohydrates, such as bread, noodles, sweet potatoes, or biscuits because they want to save money. The husband's low income due to his job as a fisherman requires pregnant women to reduce their food consumption, especially from carbohydrate sources. The research that has been done concludes that carbohydrate intake is still included in the deficient category. It was found that as many as 11 pregnant women (55%) had poor carbohydrate intake. The picture of carbohydrate intake is said to be unfavourable because it has not reached 80–100% of the nutritional adequacy rate.

Carbohydrates are the main source of nutrients for the human body. A pregnant woman needs an additional 300 calories of energy during pregnancy (Trepanowski & Bloomer, 2010). Additional energy can be obtained by increasing carbohydrate intake in daily food consumption. One of the macronutrients is carbohydrates. Carbohydrate is useful as the main

producer of glucose, which is then used as the main source for the body. Excess carbohydrate intake will be converted into fat and stored in the body in unlimited quantities. Conversely, when the body lacks energy intake, it will remodel its fat reserves (Sediaoetama, 1989).

Chronic Energy Deficiency is a condition where a person suffers from insufficient intake of or food intake that lasts long or chronic so that it can result in health problems (Fatmawati & Munawaroh, 2023). During pregnancy the needs of needs of pregnant women will increase from so that food consumption needs to be increased, especially food consumption energy sources to meet all needs of the mother and fetus because fetal nutrition depends on the mother's nutrition, so mother's needs must also be met. If the nutrition of pregnant women is not fulfilled, it will affect the growth and fetal development, among others, can increase the risk of Low Birth Weight (LBW) (Anjelika et al., 2021).

One way to reduce malnutrition in pregnant women is to provide additional food by fulfilling the needs of carbohydrates and protein and other micronutrients (Glosz et al., 2018). Research by (Schlossman et al., 2017) showed that rural women tend to consume high carbohydrate snacks and inadequate animal protein intake (Marinda et al., 2018).

Overview of Protein Intake of Pregnant Women in Bagan Serdang Village

The level of education, which typically has a big impact on pregnant women's knowledge, can cause a protein intake that is still lacking. The majority of pregnant women only graduated from high school by 90%. Nursalam (2012) states that, in general, the higher a person's education, the easier it is to receive information. Education that only graduated from high school resulted in pregnant women not understanding how adequate food intake is to support the growth and development of the foetus they are carrying. The study's results explained that protein intake in pregnant women in Bagan Serdang Village was still in the low category. This is because the results of the 24-hour recall twice showed that the most consumed sources of animal protein were chicken eggs, chicken meat, and pindang, with a consumption frequency of only 1-2 times a day with small portions, so the level of animal protein consumption in the sample was found to be lower (Lusita et al., 2017).

The lack of protein intake in pregnant women in Bagan Serdang Village is in line with the research of Kusumawati (2022), which also concluded that most of the energy intake and macronutrients were still <80% of the RDA. All macronutrient intakes are still categorised as deficient. There may not be enough food available in households because people need more money to buy it or learn more about nutrition, making it hard to get enough nutrients (Sitoayu et al., 2017).

Lack of energy and protein intake in pregnant women that lasts for a long time will impact the high risk of experiencing chronic energy deficiency. Chronic energy deficiency in pregnant women will affect the quality of the unborn foetus. Inadequate food intake over a long time (years) both in quantity and quality (Bhandari et al., 2016). Chronic energy deficiency is mostly experienced and occurs in women, commonly called women of childbearing age, aged 15–45 years, and this continues until pregnancy. To regulate food intake during pregnancy, mothers should consume a variety of foodstuffs based on balanced nutrition messages. Pay attention to the quantities and portions mothers need during pregnancy. Adequate nutritional intake functions for maintaining, growing, and developing the foetus in the womb and becomes a reserve during breastfeeding (Febry et al., 2022).

The use of ready-to-use supplementary foods (RUSFs) in the form of crackers fortified with high nutritional value flour can be a solution to prevent the risk of protein intake deficits (Roediger et al., 2020). Research on pregnant women who were given RUSF every day from week 20 (twenty) of pregnancy until birth with a small quantity (20 g) showed a positive impact on their pregnancy such as normal baby weight and length at birth (Adu-Afarwuah et al., 2016).

Tuna (Euthynnus sp) is one type of marine fish that can be used as a source of animal protein intake. The researcher stated that tuna has the advantage of being rich in omega-3 fatty acids and high protein content (Nuraini, 2013). Tuna flour contains 64.31% protein, 6.29% fat, 10.30% ash content, 2.57% crude fiber and 10.79% BETN (Cilia et al., 2016). Tuna also contains various minerals such as magnesium, iodine, iron, zinc and selenium which function to prevent anemia, prevent cancer and increase immunity in the body.

CONCLUSIONS

Most pregnant women in Bagan Serdang Village are not at risk of chronic energy deficiency. The average energy intake, carbohydrates, and protein still need improvement. Therefore, it is necessary to increase awareness of the significance of the nutritional intake that pregnant women must consume to maintain the health of both mothers and babies.

REFERENCE

Abadi, E. (2020). Konsumsi Makroniutrien pada Ibu Hamil Kekurangan Energi Kronik (KEK) Pandemi Covid-19. *Jurnal Kesehatan Manarang*, *6*(2), 85-90.

Adinda, D. (2020). Gambaran Kebiasaan Makan, Body Image Dan Status Gizi Remaja Putri di SMK Negeri 2 Sibolga. *Contagion: Scientific Periodical Journal Of Public Health And Coastal Health*, *2*(1), 39–50. https://doi.org/10.30829/contagion.v2i1.7787

Adu-Afarwuah, S., Lartey, A., Okronipa, H., Ashorn, P., Peerson, J. M., Arimond, M., Ashorn, U., Zeilani, M., Vosti, S., & Dewey, K. G. (2016). Small-quantity, lipid-based nutrient supplements provided to women during pregnancy and 6 mo postpartum and to their

infants from 6 mo of age increase the mean attained length of 18-mo-old children in semi-urban Ghana: A randomized controlled trial. *American Journal of Clinical Nutrition*, *104*(3), 797–808. https://doi.org/10.3945/ajcn.116.134692

Aguayo, V. M., & Menon, P. (2016). Stop stunting: Improving child feeding, women's nutrition and household sanitation in South Asia. *Maternal and Child Nutrition*, *12*, 3–11. https://doi.org/10.1111/mcn.12283

Amalia, I. D., Lubis, D. P. U., & Khoeriyah, S. M. (2021). Hubungan Pengetahuan Ibu Tentang Gizi Dengan Kejadian Stunting Pada Balita Relationship Between Mother'S Knowledge on Nutrition and the Prevalence of Stunting on Toddler. *Jurnal Kesehatan Samodra Ilmu*, *12*(2), 146–154.

Anjelika, Ihsan, M. H., & Dammalewa, J. Q. (2021). Faktor-Faktor yang Berhubungan dengan Kejadian Kek pada Ibu Hamil di Wilayah Kerja Puskesmas Kolono Kabupaten Konawe Selatan. *Jurnal Ilmiah Karya Kesehatan*, *2*(1), 25–34. https://stikesks-kendari.e-journal.id/jikk

Bhandari, S., Sayami, J.T., Thapa, P., Sayami, M., Kandel, B.P., and Banjara, M. . (2016). Dietary Intake Patterns and Nutritional Status of Women of Reproductive Age in Nepal: Findings from a Health Survey. *Archives of Public Health*, *74*(2), 1–15.

Chunda-Liyoka, C., Lubeya, M. K., Imakando, M., Kisling, S., Majid, S., Willis, M. S., Wood, C., Kankasa, C., & Dirusso, C. C. (2020). Healthy pregnancies and essential fats: Focus group discussions with Zambian women on dietary need and acceptability of a novel RUSF containing fish oil DHA. *BMC Pregnancy and Childbirth*, *20*(1), 1–14. https://doi.org/10.1186/s12884-020-2783-8

Cilia, Muskita, W. H., & Kurnia, A. (2016). Pengaruh Penggunaan Tepung Ikan Layang (Decapterus russelli) dengan Tepung Ikan Tongkol (Euthynnus affinis) dalam Pakan Terhadap Pertumbuhan dan Tingkat Kelangsungan Hidup Juvenil Udang Vaname (Litopenaeus vannamei) [The Effect of Flying Fish Meal. *Media Akuatika*, *4*, 177–186.

Damastuti, E., Ariyani, W. D., Santoso, M., Kurniawati, S., & Syahfitri, W. Y. N. (2011). Micronutrient daily intake of elementary school children in Bandung as determined by using NAA and AAS methods. *Atom Indonesia*, *37*(2), 62–70. https://doi.org/10.17146/aij.2011.64

Dictara. (2018). Hubungan Asupan Makan dengan Kejadian Kurang Energi Kronis (KEK) pada Ibu Hamil di Wilayah Kerja Puskesmas Sukaraja Kota Bandar Lampung. *Jurnal Ilmu Kesehatan Masyarakat Dan Kedokteran.*, *9*(2), 1–10.

Dwi, D. E. (2019). Asupan Makan Dengan Kejadian KEK Pada Remaja Putri Di SMAN 2 Pare Kabupaten Kediri (Food Intake With Chronic Energy Deficiency In Young Women In Public Senior High. *Jurnal Gizi Karya Husada*, *1*(2), 102–109.

Fatimah, P. S. (2020). Konsumsi Buah, Sayur Dan Ikan Berdasarkan Sosio Demografi Masyarakat Pesisir Provinsi Sumatera Utara. Uin Sumatera Utara. *Contagion : Scientific Periodical of Public Health and Coastal Health*, *2*(1), 51–63. https://doi.org/10.30829/contagion.v2i1.7630

Fatmawati, F., & Munawaroh, M. (2023). Hubungan Pengetahuan, Status Gizi Dan Pola Makan Dengan Kejadian Kekurangan Energi Kronik Pada Ibu Hamil Di Upt Puskesmas Bojonegara Tahun 2022. *SENTRI: Jurnal Riset Ilmiah*, *2*(6), 1873–1882. https://doi.org/10.55681/sentri.v2i6.977

Febry, F., Ainy, A., & Sudirman, S. (2022). Identification of Food Diversity Factors to Overcome Stunting in Toddlers on the Musi River Suburbs, Palembang South Sumatra, Indonesia. *Jurnal Ilmu Kesehatan Masyarakat*, *13*(2), 224–235. https://doi.org/10.26553/jikm.2022.13.2.224-235

Fitriahadi. (2018). Hubungan Tinggi Badan Ibu Dengan Kejadian Stunting Pada Balita Usia 24 -59 Bulan. *Jurnal Kebidanan Dan Keperawatan Aisyiyah*, *14*(1), 15–24.

Galgamuwa, L. S., Iddawela, D., Dharmaratne, S. D., & Galgamuwa, G. L. S. (2017). Nutritional status and correlated socio-economic factors among preschool and school children in plantation communities, Sri Lanka. *BMC Public Health*, *17*(1), 1–11. https://doi.org/10.1186/s12889-017-4311-y

Glosz, C. M., Schaffner, A. A., Reaves, S. K., Manary, M. J., & Papathakis, P. C. (2018). Effect of nutritional interventions on micronutrient status in pregnant malawian women with moderate malnutrition: A randomized, controlled trial. *Nutrients*, *10*(7), 1–14. https://doi.org/10.3390/nu10070879

Halli, S. S., Biradar, R. A., & Prasad, J. B. (2022). Low Birth Weight, the Differentiating Risk Factor for Stunting among Preschool Children in India. *International Journal of Environmental Research and Public Health*, *19*(7). https://doi.org/10.3390/ijerph19073751

Kusumawati, D. E. (2022). Gambaran Asupan Makanan dan Status Gizi pada Ibu Hamil di Huntara Kelurahan Petobo Kota Palu. *Jurnal Bidan Cerdas*, *5*(1), 25-31.

Lusita, A.P., Suyatno, S., & Rahfiludin, M. Z. (2017). Perbedaan Karakteristik Balita Stunting Di Pedesaan Dan Perkotaan Tahun 2017 (Studi Pada Anak Usia 24-59 Bulan Di Wilayah Kerja Puskesmas Gabus Ii Dan Wilayah Kerja Puskesmas Pati Ii Kabupaten Pati). *Jurnal Kesehatan Masyarakat (e-Journal)*, *5*(4), 600–612.

Marinda, P. A., Genschick, S., Khayeka-Wandabwa, C., Kiwanuka-Lubinda, R., & Thilsted, S. H. (2018). Dietary diversity determinants and contribution of fish to maternal and underfive nutritional status in Zambia. *PLoS ONE*, *13*(9), 1–18. https://doi.org/10.1371/journal.pone.0204009

Meliati. (2020). Effects of the Mother's Individual Stimulation on the Growth and Development of Infants with Low Birth Weight History. *Journal of Holistic Nursing And Midwifery*, *30*(4), 200–207.

Ningsih. (2021). Asupan Energi, Zat Gizi Makro dan Pertambahan Berat Badan Ibu Hamil. *Jurnal Kesehatan*, *12*(1), 150–156.

Nuraini, T. (2013). *Manajemen Sumber Daya Manusia*. Yayasan Aini Syam.

Nursalam. (2012). *Manajemen Keperawatan* (4th ed.). Erlangga.

Persynaki, A., Karras, S., & Pichard, C. (2017). Unraveling the metabolic health benefits of fasting related to religious beliefs: A narrative review. In *Nutrition*. https://doi.org/10.1016/j.nut.2016.10.005

Prabandari, Y. S. (2021). *Kampus Sehat : Strategi Perguruan Tinggi Mengadopsi Health Promoting University*.

Rini. (2021). Asuhan Gizi Pada Hiperemesis Gravidarum. *JNH (Journal of Nutrition and Health)*, *9*(1), 1–10.

Roediger, R., Hendrixson, D. T., & Manary, M. J. (2020). A roadmap to reduce stunting. *The American Journal of Clinical Nutrition*, *112*(Sep), 773S–776S. https://doi.org/10.1093/ajcn/nqaa205

Schlossman, N., Brown, C., Batra, P., de Sa, A. B., Balan, I., Balan, A., Gamache, M. G., Wood, L., Pruzensky, W., Saltzman, E., Roberts, S. B., & Balé, C. (2017). A Randomized Controlled Trial of Two Ready-to-Use Supplementary Foods Demonstrates Benefit of the Higher Dairy Supplement for Reduced Wasting in Mothers, and Differential Impact in Infants and Children Associated With Maternal Supplement Response. *Food and Nutrition Bulletin*, *38*(3), 275–290. https://doi.org/10.1177/0379572117700754

Sediaoetama. (1989). *Ilmu Gizi*. Dian Rakyat.

Sherly. (2015). Relationship between Body Image, Energy Intake and Physical Activity with Nutritional Status in Students of the Faculty of Medicine, University of Riau Batch 2014. *Jurnal Online Mahasiswa Fakultas Kedokteran Universitas Riau*, *2*(2), 1–10.

Sitoayu, L., Pertiwi, D. A., & Mulyani, E. Y. (2017). Kecukupan Zat Gizi Makro, Status Gizi,

Stres, dan Siklus Menstruasi Pada Remaja. *Jurnal Gizi Klinik Indonesia*, *13*(3), 121–128. https://doi.org/10.22146/ijcn.17867

SSGI. (2023). Hasil Survei Status Gizi Indonesia. *Kementerian Kesehatan Republik Indonesia*, 77–77.https://promkes.kemkes.go.id/materi-hasil-survei-status-gizi-indonesia-ssgi-2022

Sunita Almatsier. (2018). *Prinsip Dasar Ilmu Gizi*. Gramedia Pustaka Utama.

Tarigan. (2020). Asupan Energi, Protein, Zat Besi, Asam Folat dan Status Anemia Ibu Hamil di Wilayah Kerja Puskesmas Petumbukan. *Jurnal Wahana Inovasi*, *10*(1), 1–10.

Trepanowski, J. F., & Bloomer, R. J. (2010). The impact of religious fasting on human health. In *Nutrition Journal*. https://doi.org/10.1186/1475-2891-9-57

WHO. (2014). *Global nutrition targets 2025: stunting policy brief*.