DOUBLE BURDEN OF MALNUTRITION AMONG WOMEN OF REPRODUCTIVE AGE AND ITS ASSOCIATED FACTORS IN MAKASSAR DISTRICT

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ABSTRACT

The double burden of malnutrition, especially on women, continues to increase, including in Makassar City, Indonesia. The prevalence of malnutrition is quite high based on BMI category in the adult female population aged >18 years in Makassar City, namely thin (8.64%), fat (14.33%), and obese (29.75%). This study aims to compare factors related to undernutrition and overnutrition status in women of childbearing age (WUS) in Makassar District. This research is a cross-sectional study of suburban women aged 16–44 years at the Bara-baraya Community Health Center, Makassar District using a quota sampling technique for two months. Anthropometric measurements were carried out to determine nutritional status, calorie and protein intake were measured using a 24-hour recall questionnaire, and a structured questionnaire to determine the characteristics of respondents. The statistical test used is the Chi Square test. The prevalence of undernutrition, normal and overnutrition in the WUS group was 8.3%, 46.9% and 44.8%, respectively. There is a significant relationship between energy intake (p=0.032), dietary diversity (p=0.025), nutritional knowledge (p=0.029), and education (p=0.009) with nutritional status in women of childbearing age. No significant relationship was found between protein intake, occupation, economic status and age with nutritional status among women of reproductive age (p>0.05).

Keywords: double burden, malnutrition, reproductive age, women

INTRODUCTION

The Millennium Development Goals (MDGs) encompass eight objectives, two of which pertain to the health status of women. Specifically, the fifth objective seeks to enhance maternal health and decrease maternal death by 75%, while the fourth objective wants to reduce infant mortality by 50%. (UNDP, 2015). There are numerous elements that contribute to the attainment of targets pertaining to maternal and newborn mortality. The nutritional state of mothers prior to, during, and following pregnancy significantly influences the achievement of this objective. (UNDP, 2015).

Nutritional issues are becoming more prevalent among women. In Indonesia, the incidence of overnutrition and overweight is on the rise at a higher rate than the incidence of undernutrition and underweight is declining (Suryani et al., 2017). In 2010, the incidence of undernutrition in Indonesia was observed to be 19%, whereas the prevalence of overnutrition was recorded at 14%. In the year 2020, there was a decline in the prevalence of undernutrition to 10%, as well as a rise in the prevalence of overnutrition to 25%. There has been a notable rise in the frequency of overweight among women aged 18 years and above in Indonesia. In 2007, the prevalence was 19%, which rose to 30% in 2013, and then declined to 29.5% in 2018. Based on the 2018 Riskesdas report, the adult female population aged over 18 years in Makassar City has a significant prevalence of malnutrition, as indicated by the BMI (Body Mass Index) category. Specifically, the prevalence of undernutrition is 8.64%, overnutrition is 14.33%, and obesity is 29.75% (Kemenkes RI, 2018).

Internal and external factors exert effect on the etiology of undernutrition and overnutrition. Internal variables encompass various elements originating from the individual or family, including genetics, obstetrics, and sex. Nutrition, medications, environment, and disease are examples of external variables (Paramata & Sandalayuk, 2019). An individual's nutritional status is impacted by their patterns of intake. The individual may experience health issues if their consumption patterns do not align with their needs. Unbalanced dietary patterns that do not align with individual nutritional requirements can lead to an imbalance in caloric

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intake within the body, resulting in nutritional deficiencies (Alam et al., 2020). According to the framework established by the United Nations Children's Fund (UNICEF), there exists an indirect relationship between nutritional status and many factors such as socioeconomic status, household food security, utilization of health services, and women's awareness about health and nutrition. (UNICEF, 2020)

Obesity is primarily caused by two factors: food consumption and physical exercise. According to the UNICEF conceptual model, obesity is influenced by intermediate factors and basic factors, which encompass women's knowledge and other socioeconomic aspects (UNICEF, 2017). Women in the reproductive age group are a susceptible demographic that is a primary focus for health advancement. Women who are affected by malnutrition, particularly those who suffer from chronic energy deficit (CED), will face a cumulative impact on both themselves and future generations. (UNICEF, 2017).

This study seeks to investigate the correlation between many parameters, such as socioeconomic status, energy and protein consumption, dietary variety, and nutritional knowledge, and the nutritional status of women in their reproductive years. The study's originality is derived from its comprehensive methodology in identifying and assessing the various elements that contribute to the dual burden of malnutrition among women in their reproductive years.

METHODS

The present study is an observational investigation employing a cross-sectional methodology, focusing on women within the reproductive age group. In the Makassar District region, the research was carried out at the Bara-Baraya Community Health Center. The selection of Makassar District as the research site was based on its notable female population density inside Makassar City, which stands at 20,093 individuals per square kilometer. The study was carried out from August to September 2021.

The inclusion criteria for women of reproductive age in this study encompassed women between the ages of 16 and 44, residing in the Bara-Baraya health center region, and expressing their willingness to participate as responders. The investigation excluded women with specific medical conditions, including a prior diagnosis of diabetes mellitus, hypertension, cancer, HIV/AIDS, and pregnancy. The research area employed a quota sampling strategy for a duration of two months. Women of reproductive age who visit the healthcare facility between August and September 2021 were surveyed regarding their consent to participate in the study. Potential participants who express their consent were interviewed and anthropometric assessments were conducted. The anthropometric measures encompass the assessment of body weight and height through the utilization of digital scales, as well as the evaluation of the precision of the tools employed by microtools. The process of data collection was conducted by an enumerator who possessed expertise in nutrition education and had undergone training provided by the researchers.

Table 1. Recommendations for energy and protein intake

Age Group	Breast-fed		Non Breast-fed	
	Energy (Kcal)	Protein (gram)	Energy (Kcal)	Protein (gram)
16–18 yo	2490	79	2125	75
19–29 yo	2615	76	2250	65
29–49 yo	2515	77	2150	65

The independent variables in this study include energy and protein intake, food diversity, education, employment, economic status, nutritional knowledge, and age. The dependent variable is nutritional status. The nutritional status is classified into three categories: underweight (BMI <18.5 kg/m2), normal (BMI 18.5–22.9 kg/m2), and overweight (BMI ≥23 kg/m2) (World Health Organization, 2015).

Energy and protein intake data were gathered on two weekdays using an hour recall questionnaire. Food intake calculation was with NutriSurvey software. A comparison was made between the energy and protein intake of the respondents and the recommended energy and protein intake for women of reproductive age, as determined by the Indonesian Recommended Dietary Allowance (RDA). This comparison was particular to each age group and is presented in

Table 1 (Minister of Health Regulation No. 28 of 2019. Recommendations for Nutritional Adequacy Rates in Indonesia, 2019). In addition, the calorie and protein consumption was categorized into three groups: insufficient, sufficient, and excessive, according to the criteria employed in the 2014 Total Indonesian Diet Survey (Kementerian Kesehatan RI, 2014).

Insufficient energy intake was defined as being below 70% of the recommended dietary allowance (RDA), sufficient when consuming between 70%-130% of the RDA, and excessive if it was over 130% of the RDA. Protein intake was classified as insufficient if it was less than 80% of the RDA, sufficient if it was between 80%-120%, and excessive if it was over 120% of the RDA. During the process of conducting food recall interviews with participants, researchers utilized a Food Photo Book, which had been previously employed in the national research conducted for the Indonesian Total Diet Survey by the Indonesian Ministry of Health in 2013. This tool was employed to ensure a consistent level of perception regarding portion size, food type, and quantity.

The Individual Dietary Diversification Score (IDDS) questionnaire was used to quantify dietary diversification. The consumption of nine food groups—starchy foods, green vegetables, vitamin A-rich fruits and vegetables, other fruits and vegetables, offal, meat and fish, eggs, nuts and seeds, and milk and its processed products—allows for the evaluation of each person's unique food diversity. Food diversity was divided into three classes: low diversity (defined as having at least three food groups), medium diversity (defined as having at least four food groups), and high diversity (defined as having at least six food groups) (Andadari & Mahmudiono, 2017).

Through organized questionnaire-assisted interviews, information regarding age, nutritional awareness, work experience, education, and economic status was gathered. A standardized questionnaire was used to measure nutritional knowledge, which was divided into two categories: inadequate (< Median) and sufficient (≥ Median). Tertile 1 denotes low economic status, tertile 2 denotes medium economic status, while tertile 3 means high economic position (Ningrum et al., 2023).

Software for data analysis was SPSS 26. A 95% confidence level was used for both analytical and descriptive data analysis. The characteristics of the respondents, including age, education, occupation, nutritional status, energy and protein intake, dietary diversity, nutritional knowledge, and economic status, were presented using descriptive analysis. The association between energy intake, protein intake, dietary diversity, nutritional knowledge, education, employment, economic status, and age with nutritional status in women of reproductive age was examined using bivariate analysis using Chi Square and Fisher's Exact tests.

RESULT AND DISCUSSION

The study included 96 women of reproductive age, with a median age of 26 years. Up to 70% of women had completed college or have another higher education degree. About 57.3% women were unemployed. Overall, 46.9% of women had normal nutritional status (BMI 18.5–22.9 kg/m2). A majority (59.4%) of women consumed an acceptable amount of calories (80%–120%, exceeding the RDA >120%). However, a significant proportion (63.5%) had an inadequate intake of protein (less than 70% RDA, considered adequate if less than 70–130% RDA). Approximately 51% had a moderate level of dietary diversity, meaning they consumed 3-4 food groups per day. A majority of the participants in the study (54.2%) demonstrated adequate nutritional knowledge, whereas 42% of them fell within the tertile 2 economic position or demonstrated a medium economic status. (Table 2).

The findings from the bivariate analysis revealed a statistically significant association between energy intake and nutritional status (p=0.032). This study demonstrates that a higher proportion of women (54.2%) exhibit adequate nutrition compared to those with insufficient nutrition. The research revealed that there was no statistically significant correlation between protein intake and the nutritional status of WUS (p=0.207). Nevertheless, research indicates that women of reproductive age who have a satisfactory nutritional state are more prone to having a lower protein consumption rate of 50.5%. A strong correlation exists between the variety of food available and

Table 2. Characteristics of women in reproductive age in Makassar District

Variables	p-value
Age Group	
16–18 yo	5 (5.2)
19–29 yo	59 (61.5)
30–49 yo	32 (33.3)
Education Status	
Low	7 (7.3)
Moderate	18 (18.8)
High	71 (74.0)
Working Status	
Working	41 (42.7)
Not working	55 (57.3)
Nutritional Status	
Undernutrition	8 (8.3)
Normal nutritional status	45 (46.9)
Overnutrition	43 (44.8)
Energy intake (kcal)	
Insufficient	35 (36.5)
Sufficient	57 (59.4)
Excessive	4 (4.2)
Protein intake (gram)	
Insufficient	61 (63.5)
Sufficient	31 (32.3)
Excessive	4 (4.2)
Dietary diversity	
Low (Score <3)	0 (0.0)
Medium (Score 3–4)	49 (51.0)
High (Score >4)	47 (49.0)
Nutritional Knowledge	
Inadequate	44 (45.8)
Sufficient	52 (54.2)
Economic status	
Low	26 (27.1)
Medium	42 (43.8)
High	28 (29.2)

Notes: Bivariate Chi-Square Test *significant *p*-value <0.05

an individual's nutritional status (p=0.025). The majority of women with higher nutritional status (51.0%) adhered to a daily consumption of 3-4 food groups. Furthermore, the bivariate analysis revealed a strong correlation between nutritional knowledge and nutritional status (p=0.029). A significant proportion of water users (WUS) with higher nutritional status had lower levels of nutritional understanding. There exists a strong correlation between education and the prevalence of over-nutrition status (p=0.009). Furthermore, a majority of research participants (74.0%) who experienced overweight status possessed education levels falling within the medium and high categories. Table 3 below demonstrates that there was no significant correlation between economic position (p=0.146) and age (p=0.425) with nutritional status in women of reproductive age.

This study showed a substantial correlation between women of reproductive age's calorie intake and nutritional status. The study's conclusions demonstrated that overweight or underweight women of reproductive age were more likely to fall into the inadequate and sufficient energy intake groups. Good food access puts a person at risk for obesity or overweight, whereas poor food access puts a person at risk for undernutrition or underweight (Amirullah et al., 2020).

Each person's nutritional intake determines their current state of nutrition. It is well-established that a variety of factors impact nutritional status, yet these aspects are interrelated (Laswati, 2017). The major and secondary factors are what affect how the body uses nutrients. Conditions that impact food intake are primary issues because the food ingested does not have the right composition. Nutrient deficiencies resulting from the body's poor use of available nutrients are secondary factors (Stefani & Hanifah, 2022). In addition, lifestyle and surroundings might also have an impact on nutritional status (Kazaks & Stern, 2013).

One major element influencing how one's health is shaped is their nutritional state. A balanced intake of food that meets the body's needs for nutrients results in a condition known as nutritional status. Women of reproductive age have important nutritional needs, particularly before, during, and after pregnancy (Ainia & Notobroto, 2018).

The study's findings revealed no correlation between protein consumption and nutritional status. There is a negative correlation between the nutritional status among women of reproductive age and their protein intake. The study did not investigate the sources of protein intake, specifically whether it was derived from vegetable protein or animal protein. The field of nutritional science acknowledges that the use of food sources rich in vegetable protein, such as legumes, soybean products, tofu, and tempeh, as well as vegetables and fruits, can contribute to the maintenance of nutritional balance when ingested in a well-

balanced way. These findings do not provide a direct explanation for the inverse relationship between protein intake and the risk of obesity.

The nutritional status of an individual is directly influenced by their food intake. In addition to meal timings and portion sizes, it is imperative to consider the composition of the food ingested, since it has the potential to impact an individual's body weight. Insufficient intake of food, both in terms of amount and variety, can directly influence an individual's body weight. Individuals who consume food that meets the recommended caloric intake may encounter weight gain if their dietary choices are characterized by elevated levels of sugar and fat (Martony, 2020).

The findings of this study also indicated a substantial correlation between food diversity and nutritional status. The attainment of optimal nutritional status is contingent upon the consumption of nutritious food, necessitating careful consideration of both the quality and quantity of ingested food. An individual with a diverse dietary pattern, characterized by the ingestion of high-calorie foods, may experience elevated calorie intake, hence potentially resulting in heightened nutritional status or overweight (Melani, 2016). Consistent with prior studies, it was shown that women of reproductive age with normal nutritional health had a higher level of food diversification intake, albeit not statistically significant (Melani, 2016).

The present study revealed a statistically significant correlation between nutritional knowledge and nutritional status among older women. Additionally, it observed a propensity for a higher proportion of women with appropriate nutritional knowledge to exhibit such knowledge. This finding aligns with a study conducted in Lagos, which suggests that those with a high level of knowledge are more likely to exhibit good nutrition (Fasola et al., 2018). The influence of nutritional knowledge on food intake and subsequent impact on nutritional status has been demonstrated by Septiani et al. (2021). An individual's views and behavior around food will shape their food preferences and ultimately affect their nutritional consumption (Lestari, 2020).

There was no observed correlation between work status and both economic status and nutritional status in the present investigation. The study revealed that 50.9% of women who had a higher nutritional status were employed, and most women with a higher nutritional status had a moderate to high economic position. This finding contradicts prior research that suggests a favorable correlation between body weight, obesity, education, and per capita expenditure (Nugraha et al., 2021). Residents with higher incomes often exhibit consumption patterns characterized by an increased intake of food and beverages, resulting in a greater influx of energy into their bodies (Rachmi et al., 2017).

According to this study, there is a strong correlation between education and nutritional status. A majority of women within the reproductive age group who possess improved nutritional status have educational attainment levels falling within the medium and high categories. The correlation between obesity and educational attainment has been observed, albeit with varying directions across different regions (Safitri & Rahayu, 2020). Numerous studies conducted in India, Sri Lanka, Indonesia, and many African nations have demonstrated a significant correlation between educational attainment and the likelihood of developing obesity (Khusun et al., 2015; Rai, 2015; Somasundaram et al., 2019). Divergent findings were observed in the United States and France, wherein a negative correlation was observed between educational attainment and the likelihood of obesity (Drewnowski et al., 2014). The observed phenomenon is believed to be attributed to variations in the Human Development Index (HPI) between these nations. In underdeveloped countries, there is a correlation between educational attainment and obesity, but in industrialized countries, there is an inverse relationship between education and obesity (Safitri & Rahayu, 2020).

The present study has not identified a significant correlation between age and nutritional status. Unlike prior studies, the present research revealed a correlation between age and nutritional status, albeit with distinct measuring methods employed (Kusparlina, 2016). The present investigation employed upper arm circumference measurements, whereas the aforementioned study utilized body weight and height as indicators of

Table 3. Factors related to nutritional status among women of reproductive age in Makassar District

Variables	Under Nutrition	Normal Nutrition Status	Over Nutrition	n	*p*
	n (%)	n (%)	n (%)		
Energy intake					
Insufficient	2 (5.7)	14 (40.0)	19 (54.3)	35	
Sufficient	4 (7.0)	31 (54.4)	22 (38.6)	57	0.032**
Excessive	2 (50.0)	0	2 (50.0)	4	
Protein intake					
Insufficient	5 (8.2)	25 (41.0)	31 (50.8)	61	
Sufficient	2 (6.5)	19 (61.3)	10 (32.3)	31	0.207
Excessive	1 (25.0)	1 (25.0)	2 (50.0)	4	
Dietary diversity					
Low	0 (0.0)	0 (0.0)	0 (0.0)	0	
Medium	2 (4.1)	19 (38.8)	28 (57.1)	49	0.029*
High	6 (12.8)	26 (55.3)	15 (31.9)	47	
Nutritional knowledge	2 (4.5)	16 (36.4)	26 (59.1)	44	0.029*
Inadequate	6 (11.5)	29 (55.8)	17 (32.7)	52	
Education					
Low	0 (0.0)	6 (85.7)	1 (14.3)	7	
Moderate	1 (5.6)	3 (16.7)	14 (77.8)	18	0.009**
High	7 (9.9)	36 (50.7)	28 (39.4)	71	
Working status					
Working	4 (7.3)	23 (41.8)	28 (50.9)	55	0.348
Not working	4 (9.8)	22 (53.7)	15 (36.6)	41	
Economic status					
Low	0 (0.0)	12 (46.2)	14 (53.8)	26	
Medium	7 (16.7)	18 (42.9)	17 (40.5)	42	0.146
High	1 (3.6)	15 (53.6)	12 (42.9)	28	
Age group					
16–18 yo	0 (0.0)	4 (80.0)	1 (20.0)	5	
19–29 yo	5 (8.5)	27 (45.8)	27 (45.8)	59	0.425
30–49 yo	3 (9.4)	14 (43.8)	15 (46.9)	32	

Notes: Bivariate Chi-Square Test *significant *p*-value <0.05

nutritional health. It is important to acknowledge that an individual's nutritional health is directly impacted by their activity. Knowledge and the environment exert an influence on behavior (Lestari, 2020). One limitation of this study is the single-time nature of the data collection process, which limited the ability to establish a clear cause-and-effect relationship between several parameters associated to nutritional status in women of reproductive age.

CONCLUSION

A notable correlation exists between energy consumption, dietary diversity, nutritional literacy, and educational attainment with regards to the nutritional condition among women of reproductive age. In the Makassar area, a lack of substantial correlation was seen between protein consumption, occupation, economic position, and age with regard to the nutritional condition of women in reproductive age

RECOMMENDATION

Subsequent investigations should encompass the examination of physical activity, environmental conditions, attitude, and body image considerations, as these variables significantly influence an individual's nutritional state. The collection of data at a single point in time might have an impact on research findings, making it difficult to establish obvious cause and effect linkages. The findings of this study just demonstrate the impact of many factors associated with the nutritional condition of women in reproductive age, and the data collection is limited, as it only captures intake data for one 24-hour period.

The research is anticipated to yield valuable insights for the development, monitoring, and evaluation of initiatives targeting women of reproductive age.

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REFERENCES

Ainia, O. A. C., & Notobroto, H. B. (2018). Faktor Demografi Wus yang Berhubungan dengan Status Gizi Berdasarkan Lila di Puskesmas Pacarkeling Tahun 2017. Jurnal Biometrika Dan Kependudukan, 7(2), 105–112.

Alam, S., Ansyar, D. I., & Satrianegara, M. F. (2020). Eating pattern and educational history in women of childbearing age. Al-Sihah: The Public Health Science Journal, 12(1), 81. https://doi.org/10.24252/as.v12i1.14185

Amirullah, A., Andreas Putra, A. T., & Daud Al Kahar, A. A. (2020). Deskripsi Status Gizi Anak Usia 3 Sampai 5 Tahun Pada Masa Covid-19. Murhum : Jurnal Pendidikan Anak Usia Dini, 1(1), 16–27. https://doi.org/10.37985/murhum.v1i1.3

Andadari, D. P. P. S., & Mahmudiono, T. (2017). Keragaman Pangan dan Tingkat Kecukupan Energi serta Protein Pada Balita. Amerta Nutrition, 1(3), 172. https://doi.org/10.20473/amnt.v1i3.6242

Fasola, O., Abosede, O., & Fasola, F. A. (2018). Knowledge, attitude and practice of good nutrition among women of childbearing age in Somolu Local Government, Lagos State. Journal of Public Health in Africa, 9(1), 42–46. https://doi.org/10.4081/jphia.2018.793

Hanifah, N. A. A., & Stefani, M. (2022). Hubungan pernikahan usia dini dengan angka kejadian stunting pada bakita di Kelurahan Mekarsari. Jurnal Gizi Ilmiah (JGI), 9(2), 19–26.

Kazaks, A. G., & Stern, J. S. (2013). Nutrition and Obesity: Assessment, Management & Prevention.

Kemenkes RI. (2018). RISKESDAS 2018. Riset Kesehatan Dasar.

Kementerian Kesehatan RI. (2014). Buku Studi Diet Total: Survei Konsumsi Makanan Individu Indonesia 2014. Ministry of Health Republic of Indonesia.

Khusun, H., Ade, L., Wiradnyani, A., & Siagian, N. (2015). Factors associated with overweight/obesity among asults in urban Indonesia. Penelitian Gizi dan Makanan, 38(2), 95–110.

Kusparlina, E. P. (2016). Hubungan antara Umur dan Status Gizi Ibu Berdasarkan Ukuran Lingkar Lengan Atas dengan Jenis BBLR. Jurnal Penelitian Kesehatan SUARA FORIKES, 7(1), 21–26.

Laswati, D. T. (2017). Masalah Gizi Dan Peran Gizi Seimbang. Agrotech, 2(1), 69–73.

Lestari, P. (2020). Hubungan Pengetahuan Gizi, Asupan Makanan dengan Status Gizi Siswi Mts Darul Ulum. Sport and Nutrition Journal, 2(2), 73–80. https://doi.org/10.15294/spnj.v2i2.39761

Martony, O. (2020). Junk Food Makanan Favorit Dan Dampaknya Terhadap Tumbuh Kembang Anak Dan Remaja. Journal of Chemical Information and Modeling, 53(9), 1689–1699.

Melani, V. (2016). Hubungan keragaman konsumsi pangan dan status gizi wanita usia 19-49 tahun di Provinsi DKI Jakarta (analisis data Riskesdas 2010). Nutrire Diaita, 8(2), 80–84.

Ningrum, S. T., Sinaga, T., & Nurdiani, R. (2023). Pengetahuan Gizi, Perubahan Kebiasaan Makan dan Gaya Hidup, Serta Status Gizi Mahasiswa Saat Pandemi Covid-19. Jurnal Ilmu Gizi Dan Dietetik, 1(3), 156–164. https://doi.org/10.25182/jigd.2022.1.3.156-164

Nugraha, F., Relaksana, R., & Siregar, A. Y. (2021). Determinan Sosial Ekonomi Terhadap Berat Badan Lebih Dan Obesitas Di Indonesia: Analisis Data Ifls 2014. Jurnal Ekonomi Kesehatan Indonesia, 5(2), 17–28. https://doi.org/10.7454/eki.v5i2.4124

Paramata, Y., & Sandalayuk, M. (2019). Kurang Energi Kronis pada Wanita Usia Subur di Wilayah Kecamatan Limboto Kabupaten Gorontalo. Gorontalo Journal of Public Health, 2(1), 120. https://doi.org/10.32662/gjph.v2i1.390

Peraturan Menteri Kesehatan No. 28 Tahun (2019). Tentang Angka Kecukupan Gizi Yang Dianjurkan Bagi Bangsa Indonesia. Rabit : Jurnal Teknologi Dan Sistem Informasi Univrab, 1(1).

Rachmi, C. N., Li, M., & Alison Baur, L. (2017). Overweight and obesity in Indonesia: prevalence and risk factors—a literature review. Public Health, 147, 20–29. https://doi.org/10.1016/j.puhe.2017.02.002

Rai, R. K. (2015). Factors associated with nutritional status among adult women in urban India, 1998-2006. Asia-Pacific Journal of Public Health, 27(2), NP1241–NP1252. https://doi.org/10.1177/1010539512450606

Safitri, D. E., & Rahayu, N. S. (2020). Determinan Status Gizi Obesitas pada Orang Dewasa di Perkotaan: Tinjauan Sistematis. ARKESMAS (Arsip Kesehatan Masyarakat), 5(1), 1–15. https://doi.org/10.22236/arkesmas.v5i1.4853

Septiani, S., Irfiyanti, I., Hai, T. T., Khusun, H., Wiradnyani, L. A., Kekalih, A., & Sahanggamu, P. D. (2021). Food Insecurity Associated with Double-Burden of Malnutrition among Women in Reproductive Age in Ciampea Sub-district, Bogor, West Java. Indonesian Journal of Public Health Nutrition, 1(2), 21–31. https://doi.org/10.7454/ijphn.v1i2.4805

Somasundaram, N., Ranathunga, I., Gunawardana, K., Ahamed, M., Ediriweera, D., Antonypillai, C. N., & Kalupahana, N. (2019). High Prevalence of Overweight/Obesity in Urban Sri Lanka: Findings from the Colombo Urban Study. Journal of Diabetes Research, 2019:2046428. doi: 10.1155/2019/204642https://doi.org/10.1155/2019/2046428

Suryani, D., Sabrina, Y., Cholidah, R., Ekawanti, A., & Andari, M. Y. (2017). Studi Status Gizi, Pola Makan serta Aktivitas pada Anak Sekolah Dasar di Kota Mataram. Unram Medical Journal, 6(1), 14–19. https://doi.org/10.29303/jku.v6i1.104

UNDP. (2015). MIllennium Development Goals (MDGs). United Nations.

UNICEF. (2017). Uganda Situation Report.

UNICEF. (2020). Uganda Country Office Annual Report 2020.

World Health Organization. (2015). Body mass index (BMI).