

ASSOCIATION BETWEEN POCKET MONEY AVAILABILITY AND FREQUENCY OF FAST-FOOD CONSUMPTION TOWARD OVERNUTRITION CASE AMONG JUNIOR HIGH SCHOOL STUDENT, SOUTH JAKARTA

Dias Puspitaning Mawarni, Lisa Safira, Citra Ayu Aprilia

Faculty of Medicine, Universitas Pembangunan Nasional "Veteran", Jakarta

ABSTRACT

Background: As adults, over-nutrition in children due to fast food intake becomes a major issue because it raises the risk of different diseases. Previous studies. A correlation between spending money on consumption patterns is stated, but further study of the correlation to over-nutrition is required. This study aimed to analysis the association between pocket money and the frequency of fast-food consumption toward overnutrition among junior high school students.

Subjects and Method: This was a cross-sectional study carried out at Junior High School 98, South Jakarta, Indonesia. This location had a strategic location for fast-food traders. A total of 216 students' grade-8 (13-15 years old) were selected for this study. Variables in this study were pocket money, fast food frequency, and overnutrition. The data were collected using data Food Frequency Questionnaire (FFQ), Body Mass Index (BMI) measurements, and questionnaire. The data were analyzed based on the z-score table from World Health Organization (WHO).

Results: There was a significant correlation between pocket money and overnutrition, and it was statistically significant. Pocket money \leq IDR 20.000 had a greater indicated overnutrition which is influenced by several conditions. However, there is no significant correlation between the frequency of fast-food consumption and overnutrition.

Conclusions: Pocket money is correlate with overnutrition among junior high students.

Keywords: fast-food, frequency of consumption, overnutrition, pocket money

Correspondence:

Dias Puspitaning Mawarni. Universitas Pembangunan Nasional "Veteran", South Jakarta 12450, Indonesia. Email: diaspuspita@icloud.com. Mobile: +6282298476420.

BACKGROUND

Nutrition more can be defined as nutrients in excess of demand resulting in storage and other unwanted effects. Over nutrition in children can be a serious problem as in adults and is a risk factor for metabolic disease, cardiovascular disease, diabetes mellitus, cancer, and others (Ministry of Health, 2012). Indonesia contributed 8.3% of excess nutrition in the world in 2013 (Marie et al., 2014).

Practically, every nutritional component that enters the body must be metabolically processed. Excess energy has an adverse

effect on the body. In chronic nutritional excess, the body accumulates fat which leads to obesity. Adipose tissue stores excess energy in the form of triglycerides which are synthesized from excess fat and carbohydrates that are ingested (Svacina, 2008). The adipose tissue of lean individuals who eat a healthy diet and exercise regularly has small adipocytes that secrete hormones, for example adiponectin, especially protecting against insulin resistance and atherogenic states (Figure 1). It also has sufficient spare capacity to store the substrate postprandially.

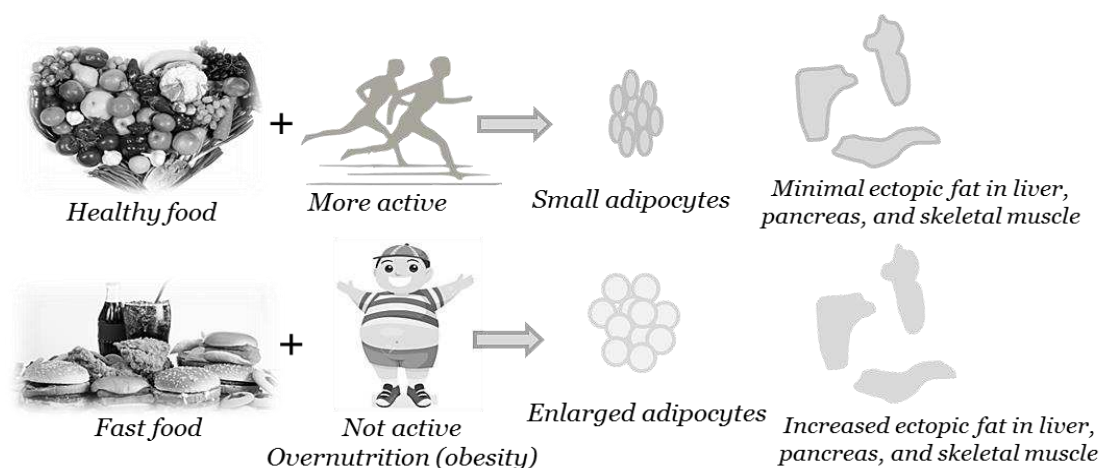


Figure 1. Illustration of Adipose Tissue and Organ Steatosis

In contrast, adipose tissue in obese individuals with an inferior diet and lack of exercise has large adipocytes that secrete hormones and cytokines continuously leading to insulin resistance (Figure 1). Such adipose tissue also lacks sufficient capacity to store excess nutrients that are absorbed into the bloodstream postprandially, leading to overflowing of other organs and steatosis of the liver, pancreas, and muscles. Infiltration of the pancreas by fat cells secondary to increased circulating fat can lead to failure of insulin secretion and the onset of diabetes (Svacina, 2008).

Some things that can lead to overnutrition include genetic, environmental (family, socio-economic and socio-cultural factors, dietary factors, sleep duration and quality, watching television and obesity, physical activity levels) (Albataineh et al., 2019). Dietary factors (shown in Figure 2) were reported to be the dominant factors in increasing excess nutrition, such as consumption of fast food (frequency), sugary drinks, snacks, and food portions. Trends in fast food consumption are influenced by money (pocket money), ease of access, and time (Prabhu, 2015).

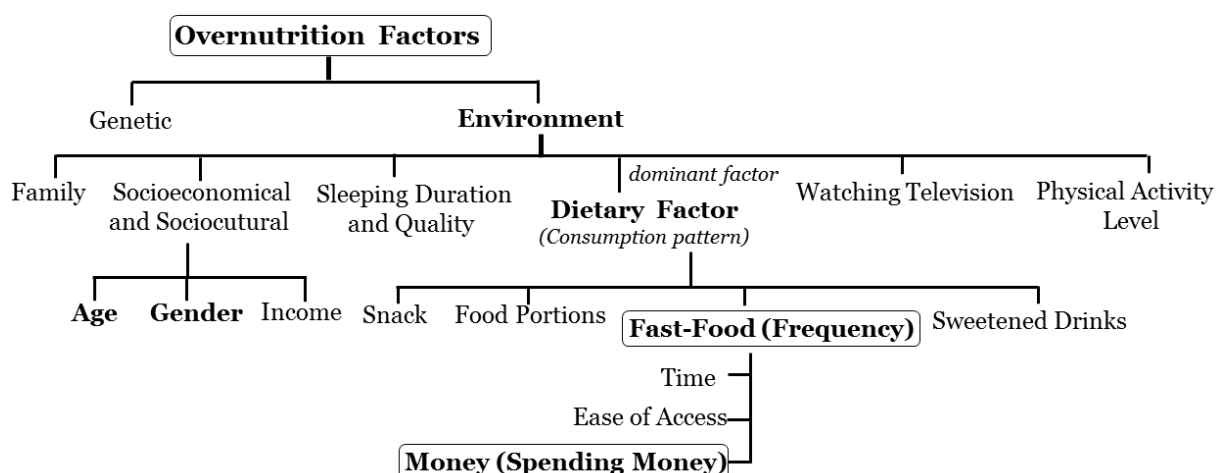


Figure 2. Schematic of more nutritional factors

Previous research (Masthalina, 2013) reported a correlation between money spend-

ing and fast-food consumption patterns. However, the correlation between the availability

of pocket money and excess nutrition has not been further analyzed. This study focuses on a more in-depth analysis of the correlation between spending on money and frequency of consumption with overnutrition in children. Sociocultural analysis of age and sex distribution was carried out to determine the condition of the sample distribution of overnutrition.

SUBJECTS AND METHODS

1. Study Design

This was a cross-sectional study conducted at of 98 South Jakarta School Junior High School.

2. Population and Sample

The population were 216 Junior High School students. The sampling technique used is probability sampling.

3. Study Instruments

The study was conducted by conducting a survey of spending money, the Food Frequency Questionnaire (FFQ), and the measurement of the Body Mass Index (BMI) based on the z-score table from WHO.

4. Data Analysis

Data was analyzed using univariate and bivariate analysis.

RESULTS AND DISCUSSION

Jakarta School Junior High has a strategic location with a fast-food restaurant. The location is approximately ≤ 1.6 Kilometer from Kentucky Fried Chicken (KFC), 600 meters from McDonald's (McD), and other fast-food restaurants and merchants. Previous studies have reported that a distance of ≤ 1.6 Km provides a 61% chance of consuming fast food (Moore & Roux, 2009).

1. Univariate Analysis

The distribution of samples aged 14 years has the highest value of 52.9% (Figure 3.a) and the sex that dominates the sample is male 56.9% (Figure 3.b). In this study, the selection of pocket money in the range of Rp. 20,000 refers to previous studies. Masthalina et al (2013), reported that teenagers have spent money in the range of IDR 20,000. This is also consistent with the research of Febriani and Margawati (2013), which states that junior high school students in Semarang are more dominant in spending IDR 20,000. Survey data analysis shows that 52% of the sample have spent money in the range \leq IDR 20,000 (Figure 3.c).

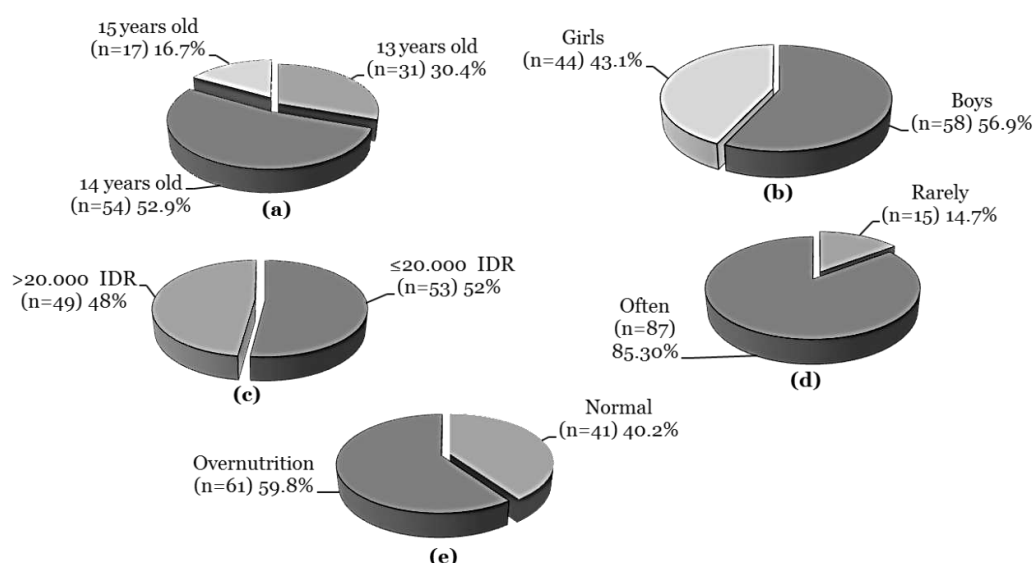


Figure 3. Sample distribution; (a) Age, (b) Gender, (c) Money Expenditures, (d) Frequency, and (e) Nutritional Status

Dietary factors are strongly associated with overnutrition / obesity in school children (Powell & Nguyen, 2013). The Food Frequency Questionnaire (FFQ) is a quantitative method of measuring food frequency by describing the frequency of consumption per day, week or month. This measurement uses a sheet of survey paper. It was found that 85.3% of the sample often (> 2 times a week) consumed fast food (shown in Figure 3.d). Rare category is frequency ≤ 2 times a week.

Meanwhile, the determination of Body Mass Index (BMI) is the ratio of body weight (kg) divided by height squared (m^2). The BMI / U table (Ministry of Health, 2010)

contains a comparison between BMI and age and has z-score information to determine the nutritional status of children. The results of data analysis showed that 59.8% (Figure 3.e) of the sample had overnutrition. Over nutrition in children will become a global problem as they age, with cases of obesity and other metabolic diseases. Excess nutrients are stored in adipocyte tissue in the form of triglycerides (TG) which are regulated by insulin, whose role is illustrated in Figure 4. In over nutrition (in the case of obesity), adipose tissue dysfunction increases the release of FFA and proinflammation. adipokine; as well as increasing cell hypoxia;

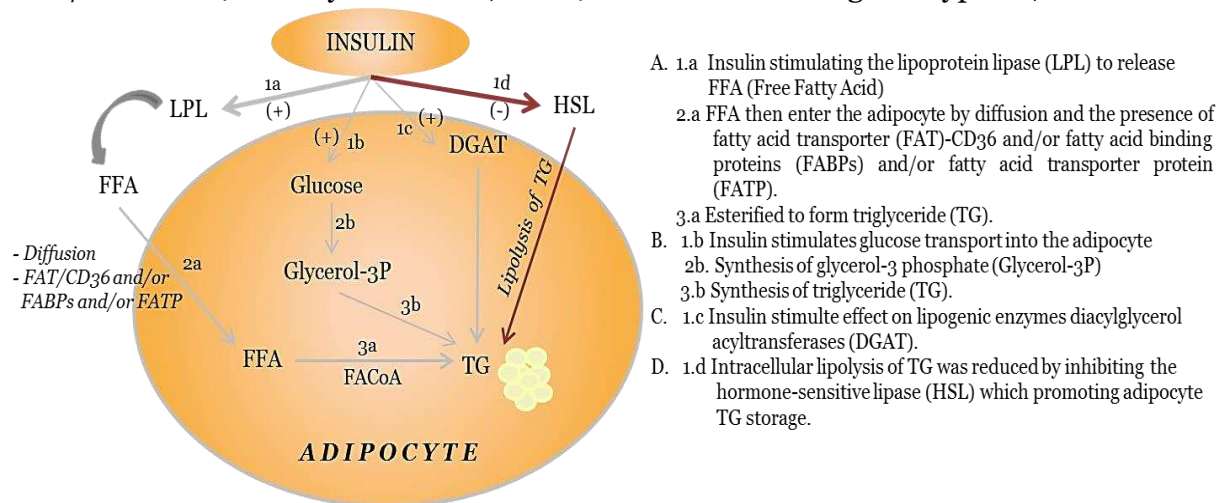


Figure 4. Role of insulin stimulation

2. Bivariate analysis

The relationship between age and overnutrition is shown in Table 1. The data shows age 14 years (54 samples) which shows that there

are 31 samples (57.4%) overnutrition, the same condition at 15 years old obtained 15 samples (88.2%) of excess nutrition.

Table 1. Relationship between Age and Nutritional Status

Age	Normal		Overnutrition		Total
	n	Percentage	n	Percentage	
13	16	51.6%	15	48.3%	31
14	23	42.6%	31	57.4%	54
15	2	11.7%	15	88.2%	17
	41		61		102

Children who eat fast food receive an average of 29% to 38% of the total energy from fast food depending on their age category. Comparing fast food consumers with

noncustomers, the total energy intake was 63 kcal or 3.6% greater per day at 4-8 years old, 132 kcal or 6.4% greater at 9-13 years old ($P = 0.050$), and 379 kcal or 16.8% greater at 14-

19 years ($P=0.050$). In the age range ≥ 14 -19 years, children consume more saturated fat, total carbohydrates, sugar, sweet drinks com-

pared to minors (<14 years) who consume more milk, fruit and vegetables (Bowman et al., 2004).

Table 2. The Relationship between Gender and Nutritional Status Nutritional

Status	Gender		Total
	Boys	Girls	
Normal	24	17	41
Overweight	34	27	61

Gender parameters indicate that boys have more nutrition than girls (Table 2). Gender is relevant to overnutrition because boys and girls differ in energy and nutritional needs (Nan et al., 2016), furthermore,

because gender discrimination in girls never stops domestic work (Burgess & Juzhong, 2000). On the one hand, children of both sexes experience different growth rates when they get older (Nan et al., 2016).

Table 3. Expenditures and Nutritional Status Nutritional

Status Correlation	Spending		Total
	> IDR 20,000	IDR 20,000	
Normal	2	39	41
Over nutrition	51	10	61

Based on Table 3, children with expenditures \leq have a nutritional status of more than IDR 20,000. there is a significant relationship with the chi-square value $p = 0.000$ ($p < 0.05$). The results of this data are the results of previous studies (Konttinen, Lahteenkorva, Silventoinen, Männistö, & Haukkala, 2011) Students with low pocket money will tend to consume energy-dense foods (higher calorie content) such as meat

and other fried foods. Fast food is known as cheap food that is easy to get with low or no nutritional value. These foods have a high calorie content; salt; saturated fat and low iron content; calcium and fiber (Nondzor & Tawiah, 2015). In addition, Terry et al (2017), reported that students with lower allowances tended to buy and prepare ready-to-eat food on the grounds that it was more practical and easier to prepare packaged food.

Table 4. Relationship of Consumption Frequency and Nutritional Status

Nutritional Status	Frequency		Total
	Rarely	Often	
Normal	7	34	41
Over nutrition	8	53	61

Chen et al. (2013) reported that the frequency of consumption of fast food is the dominant factor in the occurrence of overnutrition. The environment plays an important role as the cause of the increasing frequency of consumption. Chennakesavalu & Gangemi (2018) explain that an environment with

access to fast food can make someone get it more often. In this study, the frequency of consumption of fast food is directly proportional to the risk of overnutrition (Table 4). The location of the school is one of the causes of the increasing frequency of consumption.

However, in this study, it was found that there was a correlation between the frequency of consumption and excess nutrition with a chi-square value of $p = 0.580$ ($p > 0.05$), which indicated that there was no significant relationship between the two variables. The frequency of the phenomenon is frequent but does not present an over nutrition risk. Das (2015) reports that the frequency of fast food has a comparable relationship with the risk of overnutrition in children who do not do daily activities. In other words, samples are often in frequency but normal due to active physical activity (Svacina, 2008). In addition, there are also things that rarely happen but there are indications of over nutrition. This is caused by genetic factors and large amounts of food and physical activity that is not active (Svacina, 2008).

This study concluded that there was a significant relationship between spending of money and over nutrition with the chi-square value $p < 0.001$ ($p < 0.050$), spending \leq Rp 20,000 had a greater indication of overnutrition which was influenced by several conditions. However, the correlation between the frequency of consumption and excess nutrition obtained a chi-square value of $p = 0.580$ ($p > 0.050$), which indicates that there is no significant relationship between the two variables.

REFERENCE

- Albataineh SR, Badran EF & Tayyem RF (2019). Overweight and obesity in childhood: Dietary, biochemical, inflammatory and lifestyle risk factors. *Obesity Medicine* 15, 100-112.
- Bowman SA, Gortmaker SL, Ebbeling CB, Pereira MA & Ludwig DS (2004). Effects of Fast-Food Consumption on Energy Intake and Diet Quality Among Children in a National Household Survey. *Pediatrics* 113, 112-118.
- Burgess R & Juzhong Z (2000). *Modernisation and Son Preference*. Sticerd London: LSE.
- Chen SE, Florax RJ & Snyder SD (2013). Obesity and fast food in urban markets: a new approach using geo-referenced micro data. *Health Econ* 22(7): 835-56.
- Choe SS, Huh JY, Hwang IJ, Kim JI & Kim JB (2016). Adipose tissue remodeling: its role in energy metabolism and metabolic disorders. *Front endocrinol (Lausanne)* 7, 30.
- Konttinen H, Lahteenkorva S, Silventoinen K, Männistö S, Haukkala A (2011). Socio-economic disparities in the consumption of vegetables, fruit and energy-dense foods: the role of motive priorities. *Public Health Nutrition*: 16(5), 873-882.
- Marie N, Fleming T, Thomson B & Robinson M (2014). Global, regional, and national prevalence of overweight and obesity in children and adults during 1980-2013: a systematic analysis for the global burden of disease study 2013. *The Lancet*, 384 (9945): 766-781. doi: 10.1016/S0140-6736(14)-60460-8
- Moore LV & Roux AD, Nettleton JA, Jacobs DR, Franco M (2009). Fast-food consumption, diet quality, and neighborhood exposure to fast food. *Am J Epidemiol* 170(1): 29-36. doi: 10.1093/aje/kwp090
- Nan Z, Chandola T & Laia B (2016). Patterns and determinants of double-burden of malnutrition among rural children: evidence from china. *Plos One* 11(7), e0158119. doi: <https://doi.org/10.1371/journal.pone.0158119>
- Nondzor HE & Tawiah YS (2015). Consumer perception and preference of fast food: a study of tertiary students in ghana.

- Science Journal Of Business Management, 3(1): 43-49.
- Powell LM & Nguyen BT (2013). Fast-food and full-service restaurant consumption among children and adolescents: impact on energy; beverage and nutrient intake. *JAMA Pediatr*, 167(1): 14–20. doi: 10.1001/jamapediatrics.2013.417
- Prabhu, MN (2015). Examining fast-food consumption behaviour of students in Manipal University, India. *African Journal of Hospitality, Tourism and Leisure*, 4(2).
- Kementerian Kesehatan Republik Indonesia (2012). *Pedoman Pencegahan dan Penanggulangan Kegemukan dan Obesitas pada Anak Sekolah*. Jakarta: Kementerian Kesehatan RI
- Svacina S (2008). Basic concepts in nutrition: Overnutrition Functional and clinical consequences. *European Society for Clinical Nutrition and Metabolism*, 3(3): 173-178. doi: <https://doi.org/10.1016/j.eclnm.2008.03.002>
- Terry D, Ervin K, Soutter E & Spiller R (2016). Do Not “Let Them Eat Cake”: Correlation of Food-Consumption Patterns among Rural Primary School Children from Welfare and Non-Welfare Households. *International Journal of Environmental Research and Public Health* 14(1), 26. doi: 10.3390/ijerph14010026