

# Dietary Intake of Obese Adult Men in Jakarta

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**Abstract:** Obesity is caused by excessive storage of fat reserves in the body due to an imbalance of energy stored and energy expended. Excess and unhealthy eating patterns are associated with the incidence of obesity in Indonesia. In Indonesia itself, the population with obesity was 21.8% in 2018, and the prevalence of obesity was 29.8% of Jakarta population. The study aims to describe obese adult men's food intake as the preliminary data that can be used for dietary education material. This research was a descriptive study conducted on 50 participants living in Jakarta. The participants were healthy adult men aged 19 -59 years with BMI  $\geq 25$  kg/m<sup>2</sup>. Food intake was assessed through an interview with the 24-hour recall method implemented twice (once on a weekday and once on the weekend). The average total energy per day was 1597 kcal/day, the protein was 64 g/day, the fat was 71 g/day, and the carbohydrate was 198 g/day. The amount of energy, carbohydrate, and protein intake was still less than the recommended dietary allowance (RDA). These findings suggest that the occurrence of obesity in adult men in Jakarta might be influenced by other factors, such as genetics and physical activity


## 1 INTRODUCTION


The incidence of obesity is continuing to increase. Obesity is a significant risk factor for many chronic diseases including metabolic and degenerative diseases such as cardiovascular disease, diabetes, and cancer which increase the death risk (Jeon 2011). Based on data from the World Health Organization (WHO) in 2018, 39% of adults were overweight, and 1% were obese. In Indonesia, the number of people with obesity was 21.8% in 2018 (Risksdas 2018). DKI Jakarta had the second largest prevalence of obesity with 29.8% of the population can be categorized as obese.


Obesity is a condition where there is an imbalance of energy intake and energy expenditure resulting in accumulation of fat in adipose tissue. (Kim 2019). Dietary factors such as excessive food consumption related to the risk of obesity. Dietary fat has been known as the leading cause of weight gain. More recently, other dietary composition factors such as fiber, energy density, and eating patterns such as

eating frequency, snacking, or skipping meals have been suggested to have a potentially significant influence on energy regulation (Howarth 2005)

The increasing urbanization occurred in most countries worldwide associated with an unhealthy diet towards high fat, high energy-dense foods, and sedentary activity. Inadequate dietary intake pattern is one of the significant contributors to the development of obesity and many non-communicable diseases. As populations become more urbanised and has better income, the consumption of sugar and fat is increasing and replacing more conventional diets of high complex carbohydrates and fiber. Traditional cuisine and unique conventional food habits are being replaced by fast foods, soft drinks, and increased animal-based food consumption. Homogenization and westernization of the global diet have increased energy density (Swinburn 2004). A study conducted by Khusun H et al. in Indonesia's major urban areas, including Jakarta, found that men significantly consumed instant noodles, egg, and sugar-sweetened beverages (SSB) nonmilk (particularly coffee) more often than women. This study also showed that men

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significantly consumed fewer vegetables, biscuits, and sweet foods. Frequent consumption was defined as the number consumption of more than 13 times in a month. The study population generally had very high sedentary activities that lead to low physical activity levels and low energy expenditure (Khusun H 2016).

In this study, we want to describe the food intake of obese adult men in Jakarta as preliminary data that can be used to develop dietary education materials.

## 2 MATERIALS AND METHODS

This study was a descriptive study conducted from July-September 2020 at national companies PT. Delameta Bilano and PT. Rekayasa Industri in East Jakarta. The research participants were male employees with obese nutritional status, aged 19-59 years, BMI  $\geq 25$  kg/m<sup>2</sup>, and had no history of chronic diseases such as impaired liver function, impaired kidney function, heart disease, and type 2 diabetes mellitus. The data were collected through anamnesis and examination physical. All participants were agreed to take part in the research. There were 67 obese male individuals screened for the research, 14 individuals were unwilling to participate in the study, and three individuals did not meet the study inclusion and exclusion criteria. A total 50 individuals participated in the research. All research participants were subjected to characteristics interview, intake interview, and anthropometric measurement. The research participants in this study were recruited consecutively. This study received ethical clearance from the Ethical Committee Faculty of Medicine, Universitas Indonesia with reference number KET-281/UN2.F1/ETIK/PPM.00.02/2020. All participants signed informed consent to participate in the study before data collection were done.

A registered enumerator or nutritionist performed anthropometric measurements to all participants. Bodyweight was measured using bioelectrical impedance analysis (BIA) with an accuracy of 0.1 kg. The body weight was measured two times and the average of both measurements was used in the analysis. Height was measured in centimeters with accuracy 0.1 cm, in standing position with socks and shoes removed using Shorrboard.

Nutritional status is measured by the body mass index (BMI) which were calculated by dividing the weight in kg by the height in meters. The BMI was categorized into two categories which were on the classification of the degree of obesity, namely obese

I and obese II according to international standard (WHO 2012)

The food intake was assessed using the 2x24 hour food recall method and measured two times on weekdays and weekends. In the food recall method, the subject is asked to remember and mention the type of food consumed in the last 24 hours and is asked to explain the food/drink's name, how to make it, the ingredients needed, and the portion consumed using the household size (Shim 2014). The data from the food intake assessment were analyzed using the nutrisurvey program.

The statistical analysis was conducted using SPSS version 20. Data normality was tested using Shapiro-Wilk. Continuous variables with normal distributions were presented as mean  $\pm$  SD, and those with abnormal distributions were presented as median (minimum-maximum). Categorical variables were described as proportion and percentage.

## 3 RESULTS

The demographic and anthropometric characteristics of the participant are shown in tabel.1. The participants had the average of age 31.5 years. In term of body weight of the participants, the average of height was 168 cm while the weight and BMI average were 87 kg and 30.6 kg/m<sup>2</sup> respectively.

Table 1: Demographic and anthropometric characteristics of subjects.

Variables	Total subjects (n=50)
Age, years	31.5 (19 – 54)
Height, cm	168 (158 -187)
Weight, kg	87 (71 – 123)
BMI, kg/m <sup>2</sup>	30.6 (25 – 44)
Level of education, n(%)	
- Moderate	14 (28)
- High	36 (72)
Household income, n(%)	
- Low	7 (14)
- Moderate	43 (86)
Type of work, n(%)	
- Administration	20 (40)
- Field workers	14 (28)
- Others	16 (32)
Smoking history, n(%)	
- No smoked	19 (38)
- Mild	18 (36)
- Moderate	10 (20)
- Heavy	3 (6)

Table 2 describes the dietary intake of study participants. The average of total energy of participants was still below the recommended dietary allowance ( $1597\pm 468.7$ ). Similar findings were found in the intake of carbohydrate ( $198\pm 57$ ) as well as for protein intake ( $64\pm 29$ ). The dietary intake of fat was slightly higher than the recommendation ( $71\pm 98$ ) (AKG 2019).

Table 2: Description of dietary intake.

	Total (n=50)	RDA
Total energy, kcal/day	$1597\pm 468,7$	2150-2650
Fat, g/day	$71\pm 98$	70
Protein, g/day	$64\pm 29$	65
Carbohydrate, g/day	$198\pm 57$	415-430

## 4 DISCUSSION

This study was aimed to describe the food intake of obese adult men in Jakarta which can be used to develop dietary education materials. Findings from this study showed that the energy and carbohydrate intake of the participants were lower than the recommended dietary allowances (RDA). The protein intake was slightly lower than the RDA while the fat was adequate according to the RDA.

In recent years, there have been medical and nutritional recommendations for reducing the consumption of saturated fatty acid (SFA) due to the increase of low-density lipoprotein (LDL) as a risk factor of cardiovascular disease. Population studies have demonstrated that elevated LDL cholesterol and apolipoprotein B (apo B) levels are directly associated with the risk of atherosclerotic events. Infiltration and retention of apo B containing LDL in the artery wall are critical in initiating an inflammatory response. Modified lipoprotein stimulates macrophages to promote foam cell formation, which is the hallmark of atherosclerosis's fatty streak phase (Boren 2020). High-fat levels in the body stimulate inflammation, which is the pathogenesis of many chronic diseases. High-intake of fat and carbohydrate contributes to increased oxidative stress and also inflammation (Fortes 2020).

Dietary proteins influence body weight regulation through several mechanisms such as weight regulation, satiety, thermogenesis, energy efficiency, and body composition. Protein ingestion results in higher ratings of satiety than equicaloric amounts of carbohydrates or fat. Protein intake also induces higher thermogenesis than for other macronutrients. The increase in energy expenditure is caused by

protein, urea synthesis, and gluconeogenesis. Higher intake amounts of protein during dietary management of obesity resulted in more significant weight loss than with lower amounts of protein (Keller 2011).

The results of a study conducted by Mansoor et al. suggest that variation in the ranks of carbohydrate, protein, and fat consumed may affect obesity (Mansoor 2016). Besides, various dietary macronutrients were associated with metabolic abnormalities that increase cardiovascular disease and mortality (Kim, 2019). Research in South Korea states that high carbohydrate intake is associated with a decrease in high-density lipoprotein (HDL) and increase triglyceride levels (H.Choi 2012). The identification of macronutrients in obese people is essential to have an individual approach regarding an appropriate diet (Kim 2016).

Obesity is a low-grade inflammatory condition. The complexity of this chronic disorder becomes more apparent, exhibiting a multifactorial etiology. Besides lifestyle factors such as dietary patterns and exercise, nutrigenetics and nutrigenomics also contribute to the phenotype of obesity. Nutrigenetics and nutrigenomics theory explain the genome's interaction to regulate the development and progression of obesity and its comorbidities. These mechanisms explain differences in the obese phenotype that vary both within and across the population. (Joffe 2016). The results of this study showed that most of the subjects were not smokers. These results are similar to studies in Japan, where non-smokers are at greater risk of obesity than those who smoked (Watanabe 2016). Previous studies have suggested that cigarette smoking itself, in particular nicotine, could decrease body weight by appetite suppression and increased energy consumption (Filozof 2004).

## 5 CONCLUSIONS

This study found that energy, carbohydrate, and protein intake of obese adult men in Jakarta were still lower than the recommended dietary allowance (RDA) but not for the fat intake. These findings imply that other factors such as a genetic and physical activity may contribute to the increased prevalence of obesity in adult men in Jakarta. Further research is needed to explore the contribution of those factors to the increased prevalence of obesity particularly in adult men population.

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