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Factors Affecting Adult Food Traders Nutritional Status in Bogor Regency

Faktor-Faktor yang Mempengaruhi Status Gizi Pedagang Makanan Usia Dewasa di Kabupaten Bogor

Maulida Rochmatun Nazila[1], Nur Intania Sofianita[1]*, Yessi Crosita Octaria[1], A'immatul Fauziyah[1]

[1]Program Studi Gizi Program Sarjana, Fakultas Ilmu Kesehatan, Universitas Pembangunan Nasional Veteran Jakarta, Depok, Indonesia

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Correspondent:
Nur Intania Sofianita
intania@upnvj.ac.id

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ABSTRACT

Background: Overnutrition is becoming more common in Indonesia, with 13.5% of adults overweight and 28.7% obese. A lack of physical activity, excessive food consumption, and high consumption of risky foods such as sugar, salt, and fat are risk factors for nutritional status.
Objectives: To determine the factors that influence the nutritional status of adult food traders in Bogor Regency.
Methods: Researchers used a cross-sectional design in this study involving 99 food trader respondents aged 26-45 years using a convenience sampling method. Data collection started from January to May 2023. Nutritional status was measured using the Body Mass Index and then classified based on PGN 2014. Meanwhile, data on sugar, salt, and fat intake was collected using SQ-FFQ (Semi Quantitative Food Frequency Questionnaire) and PAL (Physical Activity Level) to determine the respondent's level of physical activity. Data analysis was using Fisher's test and logistic regression.
Results: Based on Fisher's test analysis, there was a significant relationship between salt intake (p=0.041), physical activity (p=0.002), and food traders classification (p=0.000) with nutritional status. Meanwhile, no significant relationship was found between sugar and fat intake with nutritional status. The results of the logistic regression test showed that the most influential factor of nutritional status was excessive salt intake. Respondents with excessive salt intake had a 6.03 (95% CI=1.07-33.76) times higher risk of experiencing nutritional problems.
Conclusions: There was a relationship between salt intake, physical activity, and food traders' classification with nutritional status. Meanwhile, there was no relationship between sugar and fat intake with nutritional status. The factor that most influenced the nutritional status of adult food traders in Bogor Regency was salt intake.

INTRODUCTION

Nutrition problems in Indonesia need to be addressed immediately. One of the causes is low public awareness about improving nutritional status[1]. Based on data from the Ministry of Health, there was an increase in overweight and obesity. It was shown that overweight in adults over 18 years old is more than 10.78% for men and 15.13% for women. Meanwhile, obesity prevalence in men is 12.94%, and in women is 34.05% using the Body Mass Index (BMI) indicator >27[2]. Lack of physical activity and consumption of risky foods and drinks (high in sugar, salt, and fat) will have an impact on nutritional status and obesity. Not only that, excessive consumption of sugar, salt, and fat will increase the impact of degenerative diseases such as stroke, cancer, and diabetes[3]. Normal nutritional status is very important for each individual's physical development and body strength. Balanced nutritional intake is necessary in order to maintain normal nutritional status, support work productivity, and protect from non-communicable disease exposure[4].

Sugar intake is necessary for humans in certain amounts and limits to carry out their functions. According to the Ministry of Health, the recommended maximum daily sugar intake is 50 grams or 4 tablespoons, and the maximum salt intake is 1500 mg according to the 2019 Recommended Dietary Allowances (RDA) recommendations for men and women adults. Consuming too much salt will have a negative impact on your health and nutritional status. Consuming excess fat can lead to overnutrition. Being overweight is an abnormal and overfat condition that can lead to poor health. The need for fat intake in adults should not exceed 630 kcal.

During the Covid 19 pandemic, crowd restrictions have been implemented, which means the activities

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outside the home are very limited. So, it had an impact on the commercial sector, especially on food and beverage sales[5]. Due to the rapid spread of Covid 19 and the absence of a vaccine at that time, the government implemented a work-from-home system to reduce outdoor activities and implement social distancing. This was one of the factors causing a decrease in people's physical activity, which can increase the risk of overnutrition, obesity, and other diseases[6].

Non-communicable diseases can be considered as one of the current global problems. Indonesia faces an increase of non-communicable diseases (NCDs) incidence every year. The results of Arifin's study in 2022[7], which processed secondary data from Riskesdas (Basic Health Research) in 2018, showed that almost 10% of respondents in Indonesia suffered from non-communicable diseases (NCDs). The factors that cause NCDs include depression, not going to school, passive smoking, consuming fatty foods, burned foods, foods with preservatives, consuming foods with excessive spices, soft drinks, and obese condition. Certain behaviors associated with NCDs, such as lack of physical activity and unhealthy eating habits, are contributing factors to health problems[8]. Eating habits, sleeping habits, and physical activity are factors that can influence obesity[9]. Obesity can be considered a medical condition where there is an accumulation of body fat that exceeds the body's needs. Changes in behavior and lifestyle habits can affect nutritional status in adulthood. The studies show that several independent food and beverage suppliers sometimes consume their products[10]. In connection with the research objectives, it is necessary to know the factors that influence the nutritional status of adult food traders in Bogor Regency, West Java.

METHODS

This cross-sectional analytical observational study was carried out in Cibinong District, Bogor Regency, from January to June 2023. The Slovin formula was used to determine the sample size. From the calculation results, the sample size was 99 respondents. The sampling method used in this study was convenience sampling, in which the researchers deliberately selected respondents who had already been there. There were two classifications of respondents in this study: (1) mobile food traders who sell their food by moving around, such as on foot or using bicycles, motorbikes, and other vehicles; and (2) settled food traders who already have settled place to trade, such as stalls, kiosks, or mini markets.

Food intake data was obtained from interviews with reference to the SQ-FFQ (Semi-Quantitative Food Frequency Questionnaire) form, which provides an overview of food intake patterns over a certain period of time regarding the intake of sugar, salt, fat, and also PAL (Physical Activity Level) questionnaire for defining physical activity. Anthropometric measurements were taken using weight scales and microtoise. The classification of nutritional status in this study used PGN 2014, which is categorized into two groups: non-overnutrition and overnutrition. The results of intake measurements were categorized into excessive and non-excessive. At the same time, physical activity uses calculations using the PAL (Physical Activity Level) indicator has several levels, namely light, moderate, and heavy levels.

Sugar and salt intake in this study have two cut-off references. Sugar intake is limited to 50 grams based on references from the Ministry of Health, salt intake of 1500 mg per day, sugar intake of 70 grams daily for men, and 60 grams daily for women based on the AKG 2019 (Recommended Dietary Allowance). The analysis used in this research was the Fisher test and logistic regression to see the most influential factors between sugar, salt, fat, and physical activity intake and the nutritional status of adult food traders in Bogor Regency. This research was approved by the Health Research Ethics Commission (KEPK) of the Jakarta Veterans National Development University with ethical number 213/V/2023/KEPK.

RESULTS AND DISCUSSION

The classification of food traders in this research is divided into two categories, namely mobile and settled food traders. Settled food traders are traders who sell food and drinks in places or stalls, while mobile food traders are street vendors or traders who sell food and drinks around. This research showed that most food traders were settled (selling on-site), with 52 respondents, and the number of mobile food traders was 47. This division was made with the assumption that mobile traders will tend to have a higher physical activity due to the demands of their work as mobile food vendors.

Tabel 1. Characteristics and nutritional status of respondents

Respondent Characteristics	n (N=99)	%
Age		
Early adulthood (26 - 35 Years)	36	36.6
Late adulthood (36 - 45 Years)	63	63.4
Sex		
Male	55	55.6
Female	44	44.2
Types of food vendors		
Settled food traders	52	52.5
Mobile food traders	47	47.5
Nutritional Status (BMI)		
Normal (18.5 – 25.0)	49	49.5
Overweight (25.1 – 27.0)	12	12.1
Obese (>27)	38	38.4

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The majority of respondents (63.4%) belonged to the late-adulthood group. Adulthood is when people begin to feel greater responsibility for themselves and no longer depend on their parent's financial situation. Trading is one way to increase one's income. For traders, late adulthood is when they want to be independent and able to support their families and survive while simultaneously showing that they can earn their own income. More than half of the respondents (55.6%) were men. The research obtained results were in line with previous research[11], men's responsibilities in the economy are greater than women, so food traders are commonly men. However, the fact that 44.2% of respondents were women shows the significance of women's role in economic activities. The nutritional status in this study used the 2014 PGN reference; more than half (50.5%) of the respondents had abnormal nutritional status, either overweight or obese, and 49.5% had normal nutritional status.

Table 2. Overview of sugar, salt, fat intake and physical activity level

Variable	n (N=99)	%
Sugar intake		
Non-excessive	52	52.5
Excessive	47	47.5
Salt intake		
Non-excessive	13	13.1
Excessive	86	86.9
Fat intake		
Non-excessive	32	32.3
Excessive	67	67.7
Physical activity		
Light (1.4 – 1.69)	30	30.3
Moderate (1.7 – 1.99)	31	31.3
Heavy (2.00 – 2.40)	38	38.4

Nutritional status is closely related to food intake, affordability, and daily physical activity[12]. The development of non-communicable diseases is one of the threats that will arise if the nutritional status of adults is not normal[13]. The food intake data in this study focused on sugar, salt, and fat. Data collection was carried out using the SQ-FFQ (Semi-Quantitative Food Frequency Questionnaire), with a list of 21 foods. The data in Table 2 illustrates the eating patterns of respondents the majority choose to consume salty and fatty foods more often, with the proportion of respondents consuming more salt at 86.9% and consuming excess fat at 67.7%. Diet has an influence on individual health, according to Dunford's 2022 research[14] which shows that many adults tend to consume more unhealthy foods for their daily needs, such as foods high in sugar, salt, and fat.

Physical activity in this study was divided into three categories: light activity, active/moderate activity, and heavy activity. Table 2 shows that the majority of respondents carried out relatively heavy levels of physical activity; respondents with a high level of physical activity intensity or were very active were 38.4%, and those with an active level of physical activity were 31.3%. This is related to the food traders' activities; for example, mobile food traders carry out physical activities such as pushing carts to sell their wares.

Table 3. Associations between sugar, salt, and fat intake, physical activity, and types of food sellers with nutrition status

Variable	Nutritional Status				Total		*p-value*
	Normal		Overnutrition				
	n	%	n	%	n	%	
Sugar intake							
Non-excessive	22	42.3	30	57.7	52	100	0.161
Excessive	27	57.4	20	42.6	47	100	
Salt intake							
Non-excessive	10	76.9	3	23.1	13	100	0.041*
Excessive	39	45.3	47	54.7	86	100	
Fat intake							
Non-excessive	19	59.4	13	40.6	32	100	0.202
Excessive	30	44.8	37	55.2	67	100	
Physical activity							
Light	7	23.3	23	76.7	30	100	0.002*
Moderate	17	54.8	14	45.2	31	100	
Heavy	25	65.8	13	34.2	38	100	
Types of food sellers							
Mobile food sellers	36	76.6	11	23.4	47	100	0.000*
Settled food sellers	13	25.0	39	75.0	52	100	

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*Fisher exact test showed significant associations (p<0.05)

Associations between Sugar Intake and Nutrition Status

Table 3 shows that there was no significant relationship between sugar intake and nutritional status (p=0.161). The majority of respondents had normal nutritional status; as many as 20 respondents consumed more sweet foods and had higher nutritional status. Someone who rarely eats sweet foods did not pose a health risk because their intake of sweet foods was not excessive, so they are unlikely to be at risk of obesity. This is in accordance with Ahmad's research in 2020[15], which showed a p-value of 0.176 for the consumption of sweet foods and concluded that there was no relationship between the consumption of sugary foods and nutritional status. However, many studies provided the relationship between excess sugar intake, overweight, and obesity because consuming sweet foods can increase the risk of non-communicable diseases in the long term.

At the time of data collection, interviews were conducted regarding sugar intake, and respondents commonly did not like consuming sugar, so based on this research, most respondents were not excessive in sugar intake. Excessive intake of sweet foods can also increase the risk of developing diabetes mellitus[16]. A healthy diet that leads to the consumption of risky foods, such as sugar, should be limited, especially when dieting because it can reduce the risk of a significant decrease in endurance or weakness in the future[17].

Associations between Salt Intake and Nutrition Status

Table 3 shows that p=0.041 (p<0.05). This shows that the respondents' consumption of salty food was quite high. This is proven by the high consumption of instant noodles and salted fish. At the time of data collection, interviews were also conducted regarding salt intake, and most respondents ate more salt because they preferred savory, salty foods, and salt intake was easy to find in the surrounding environment. Consuming too much salt can cause abnormal nutritional status, increasing the risk of non-communicable diseases. However, increasing salt intake can cause an increase in blood pressure[18]. According to Saragih[19], consuming too much salt can affect health problems, especially heart function which can ultimately increase blood pressure. Lanaspa's research shows that consuming salt with a rather high osmolarity can cause obesity. High salt intake may be associated with increased leptin levels, which can impair appetite control and energy expenditure[20].

Navia's research[20] shows that people with a higher nutritional status consume more salt; this is related to salt as a stimulant that supports opioid receptors in the brain. In addition, consuming salty foods every day can cause food addiction. This can cause an increase in calorie intake, obesity, and other non-communicable diseases. This is also in accordance with Rolag's research[21], which states that salt intake can make food taste salty, causing overeating. Eating too much salt without adequate physical activity affects nutritional status because overeating can cause fat accumulation, which leads to obesity[22].

Associations between Fat Intake and Nutrition Status

The results in Table 3 above show that there was no significant relationship between fat intake and the nutritional status of respondents, with p=0.202 (p<0.05). The study results showed that as many as 50 respondents consumed more fat and had a higher nutritional status. Excessive fat intake directly influences nutritional status, while nutritional knowledge about daily fat intake limits is an indirect factor that also plays an important role[23]. Praditasari & Sumarmik[24] stated that there was no relationship between fat intake and nutritional status, but fat intake has an influence. The higher the fat intake, the more impact it will have on nutritional status. In Surbakti's research[25] stated that fat intake is the largest energy source compared to other energy forms. Sources of fat come from plant oils, butter, margarine, chicken, and foods processed using oil.

Associations between Physical Activity and Types of Food Sellers with Nutrition Status

Based on Table 3 above, the results obtained were p=0.002 (p<0.05), indicating a significant relationship between physical activity and the nutritional status of the respondents. Physical activity is one of several factors that have quite an influential role in determining a person's nutritional status. If excessive eating habits are not balanced with adequate physical activity, it can cause weight gain and an increased risk of non-communicable diseases. The data processing results above align with Puji's research[26], who found a clear relationship between physical activity and nutritional status. For adults who are overweight and have low levels of physical activity, increasing physical activity becomes a necessity to reduce the risk of disease. In addition, physical activity has a positive impact on mental health, such as reducing stress and anxiety[27]. Respondents with eating habits that are unhealthy for the body and minimal physical activity can have suboptimal nutritional status[28]. The results of this study are similar to Roring's research[29], which stated that there was a relationship between physical activity and nutritional status.

Associations between Food Vendor Classification and Nutritional Status in Bogor Regency

Based on the test results in the table above show that there was a relationship between the classification of food traders (mobile and settled) and nutritional status, with p = 0.000 (<0.05). This was most likely due to the high level of physical activity among mobile traders who had to move their sales from place to place while pushing carts, walking, or cycling so that most mobile food traders have normal nutritional status.

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Tabel 4. Determinants for overnutrition among food sellers

Variable	B	df	*Sig.*	Exp(B)	95% CI	
					Lower	Upper
Sugar intake	-0.909	1	0.094	0.403	0.139	1.168
Fat intake	1.797	1	0.041	6.034	1.078	33.761*
Salt intake	0.530	1	0.369	1.699	0.535	5.401
Physical activity	-0.332	1	0.314	0.718	0.376	1.360
Types of food sellers	-2.241	1	0.000	0.106	0.036	0.312

*Logistic regression showing significant result

Table 4 shows that only salt intake and types of food sellers have p<0.05 (salt intake 0.041 and types of food sellers 0.000). Meanwhile, Exp (B) explains that changes in salt intake were 6.03 (95% CI=1.07–33.76) times related to nutritional status. Excess salt in the body can cause abnormal nutritional status, which is related to water retention that occurs in the body, so several respondents in this study had excess nutritional status. Food intake is one of the determinants or risk factors for a person's nutritional status. This is related to Ulil's research[31], which shows that diet has the biggest influence on nutritional status, especially if there is an excess of nutrients. Contributor consumption must be maintained in balance; apart from that, physical activity must also be carried out regularly to maintain normal nutritional conditions.

CONCLUSIONS

This research shows that there was a significant relationship between salt intake, physical activity, and the classification of food traders (mobile and stationary) with nutritional status. Salt intake was the factor that most influenced the nutritional status of adult food traders in Bogor Regency. So, nutrition education or behavior change communication strategies to prevent obesity, and the risk of non-communicable diseases in this group should focus on the importance of reducing salt intake through snacks or other risky foods. Education regarding fat, sugar intake, and physical activity is still provided, but the entry point for expected behavioral changes can be aimed at reducing the consumption of snacks or savory or salty foods. Apart from that, it can be recommended to be wise in choosing healthy and nutritionally balanced foods and for sedentary traders to be able to increase physical activity such as light exercise at home in order to minimize excess nutritional status and obesity, which is at risk of causing non-communicable diseases.

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Conflict of Interest and Funding Disclosure

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