



Factors Affecting the Central Obesity (Pot Belly) Risk in State Attorney Office

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Abstract

Background: *Obesity has become a health problem and nutrition of the world community in both the developed and developing countries, including Indonesia. Central obesity is one type of obesity in which fatty deposits occur in the abdomen. Central obesity is more at risk of health problems such as diabetes mellitus, metabolic syndrome, hypertension and cardiovascular disease than general obesity.*

The Objective: *The study aimed to analyze the risk factors for the occurrence of central obesity of government employees in the State Attorney's Office Bandar Lampung, Indonesia. The independent variables used were an emotional, mental state, fiber consumption, fat consumption, and physical activity.*

Method: *This study is analytic with a cross sectional design. Research using the entire population of 79 civil servants in the State Attorney's Office, Bandar Lampung and data were analyzed using Chi-square and logistic regression test.*

Result: *The analysis showed that factors associated with central obesity is mental emotional ($p = 0.045$), fiber consumption ($p = 0.004$), fat intake ($p = 0.000$) and physical activity ($p = 0.041$) and the predominant risk factor associated with central obesity is physical activity ($p = 0.011$; OR = 10.66).*

Conclusion: *The significant relationship factors with the occurrence of central obesity are an emotional mental state, fiber consumption, fat consumption and physical activity. Further, the most dominant factor is the physical activities necessary to the health and nutrition examination regularly.*

Keywords: *central obesity, government employees, mental, emotional, physical activity.*

Introduction

Now a day's people with excess weight is not only prevalent in developed countries. The high sheer number of people with excess weight has become health and nutrition problems in the world community. Low, Chin and Deurenberg-Yap (2009) show that in developed countries the prevalence of overweight is ranged from 23.2% to

66.3% and the incidence of obesity is 2.4% to 32, 2%. Similarly, in developing countries, the prevalence of overweight is ranged from 13.4% to 72.5% and the incidence of obesity 2.4% to 35.6%.

Weight exceeds the ideal limit (ranging from *overweight* to *obesity*) occurs because of an excessive accumulation of fat in the body,

especially in the adipose tissue cells. If the excess fat is evenly distributed almost in all parts of the body, it is called general obesity, and if only to accumulate around abdomen it is called central obesity (also called potbelly).

Determining the severity of obesity is determined by measuring the Body Mass Index (BMI), while the determination of the severity of central obesity is determined by measuring the abdominal circumference. In the Asian population will be categorized as central obesity if abdominal circumference ≥ 90 cm in men and ≥ 80 cm in women (Kementrian Kesehatan RI, 2013).

Various studies have shown that central obesity is more dangerous than general obesity as central obesity is known as a direct factor causing the emergence of non-communicable diseases, such as heart and blood vessel disease (Ramayulis, 2014).

Adipose cells as fat storage in the body are the organ that produces biologically active molecules such as *pro-inflammatory cytokines*. Compared with the general obesity, central obesity is a health risk due to excretion of *pro-inflammatory cytokines* increased in the blood circulation so that it can lead to inflammation of the vascular wall. Obesity can be caused by many things, such as eating habits or diet, and less physical activity (Sudoyo, 2009). Other factors that may increase the risk of obesity are gender, age, nutritional knowledge, education, attitudes about obesity, nutrient consumption, and stress (Widiantini et al., 2014).

Wrong food consumption behavior and physical inactivity cause the body's metabolism impaired that can cause overweight and obesity. Bowen (2015) showed that there is a relationship between the intake of energy, protein, and fat with central fatness. Further Vera & Naomi (2012) indicates that there is a relationship between the consumption of carbohydrates and fiber with the incidence of central obesity.

The emotional, mental condition of a person is also associated with central obesity. This is evidenced from Sugianti (2009) which states that

the incidence of central obesity was higher occurred on respondents whose low emotional condition / impaired. In the study also noted that respondents who have a little emotional situation turned out to have a risk of 1.15 times for central obese compared with regular passionate state respondents.

Another factor that is closely related to the incidence of obesity is physical activity. Physical activity is a body movement produced by skeletal muscles that expend energy. Enough physical activity can reduce the risk of disease, including obesity. Various studies suggest a significant association between physical activity with obesity, the lower the risk of obesity with physical activity is high. Widiantini (2014) notes that there is a relationship between physical activity and obesity. Obesity is lower if the respondents have moderate or strenuous physical activity.

Civil Servants is the workforce a lot of activity in the room so that the level of physical activity are at levels mild to moderate. In the study conducted by Wang et al. (2012), office workers have a high risk of developing central obesity compared with field workers or laborers. These results are consistent with Arundhana (2010) that found abdominal obesity is 33% more in men who have sedentary jobs (professionals, managers, administration) and only 6% in those with active jobs (farmer, fishers, carpenters).

Based on the above it is fascinating to study the problems of central obesity on government employees in conjunction with physical activity, consumption of fiber, fat consumption, and mental, emotional state (stress).

This study aims to determine the mental state of emotional ties, fiber consumption, fat consumption, and physical activity with central obesity at the State Attorney's Office employee Bandar Lampung. There is never any obligation for the prosecutor's office clerks to check the health or nutritional status on a regular basis because there are no routine screening programs to weight gain and central obesity. Though based on the instruction of the Attorney General

Prosecutor's acceptance of civil servants in Indonesia the prospective employee must have an ideal body weight with a standard BMI 18-25 kg / m².

Methods

This study was conducted with the design of analytical research with a cross sectional approach. The population of the study was all civil servants working in the State Attorney's Office Bandar Lampung. Based on employment data until June 2017 amounted to 79 civil servants who recorded the whole person and will be measured by referring to criteria of not in dieting/fasting. This study was conducted in May through October 2017 using research instrument tape to measure the circumference of the abdomen respondents, questionnaires, sheet Food Recall, *Self Reporting Questionnaire* (SRQ) and *International Physical Activity Questionnaires* (IPAQ).

Results

The characteristics of respondents can be seen in the following table:

Table 1. Characteristics of Respondents

Characteristics	Number	%
Age:		
Risky (≥30 years)	64	85.3
Not risky (<30 years)	11	14.7
Gender:		
Male	38	50.7
Female	37	49.3
Marital Status:		
Married	61	81.3
Not Married	14	18.7

From all civil servants in the State Attorney of Bandar Lampung, amounting to 79 people apparently only 75 people were successfully measured, while four others cannot be measured for being sick and fasting. Most respondents are older than or equal to 30 years (85.3%) and married (81.3%), while the number of male respondents and women is relatively similar.

Table 2 Descriptive Analysis

Variable	Number	%
Status of Obesity:		
Central Obese	44	59.1
Non-Central Obese	31	40.9
Emotional Mental Condition:		
Disorders	45	60.0
Normal	30	40.0
Fiber Consumption:		
Poor	47	62.7
Fair	28	37.3
Consumption of fats:		
More	48	64.0
Light	27	36.0
Physical Activity:		
Light	24	32.0
Medium	38	50.7
Heavy	13	17.3

Results of measurements carried out on 75 employees of City District Attorney's Office Lampung showed that 44 (59.1%) face the central obesity, 31 (40.9%) had no central obesity. The emotional, mental condition of respondents demonstrates 45 people (60%) detected a disturbance, 30 (40%) had normal mental emotional. Respondents with less consumption of fiber in the category as many as 47 people (62.7%), 28 (37.3%) consume enough fiber. Respondents who drank more fat are 48 people (64%), 27 (36%) absorbs light fat. Respondents who do light activity 24 (32%), 38 (50.7%) performs common action and respondents who complete strenuous physical activities are 13 (17.3%).

Table 3. Multivariate Analysis

Variables	Central Obesities				P-value
	Yes	%	No	%	
Emotional Mental Condition:					
Disorders	30	66.7	15	33.3	0.045
Normal	14	46.7	16	53.3	
Fiber Consumption:					
Poor	33	70.2	14	29.8	0.004
Fair	11	39.3	17	60.7	
Consumption of fats:					
More	36	75.0	12	25.0	0.000
Light	8	29.6	19	70.4	
Physical Activity:					
Active	40	64.5	22	35.5	0.041
Non-active	4	30.7	9	69.3	

Based on the results of the *chi-square* test it can be seen that statistically significant relationship between the emotional, mental state of respondents with central obesity ($p = 0.045$). The test results with central obesity fiber consumption value of $p = 0.004$ mean there is a significant association between fiber intake with central obesity. Testing of fat consumption to central obesity shows p -value = 0.000, which indicates there is the relationship between fat consumption with central obesity. Finally, the results of analysis of the condition of physical activity against central obesity are p -value = 0.041 meaning that there is a relationship between physical activity and central obesity.

Table 4. Multivariate Analysis of Dominant Factors

Independent variables	p-value	Odds Ratio	α (5%)
Mental Emotional	0.120	0.68	0.06 to 1.77
Fiber Consumption	0.026	6.71	2.90 to 20.62
Fat Consumption	0.000	4.89	2.58 to 14.12
Physical Activity	0.011	10.66	3.50 to 48.70

Multivariate analysis was conducted to determine the most dominant variable associated with central obesity. It can be seen from OR with the highest value. Based on the report, *logistic regression* showed that physical activity is the most dominant factor associated with central obesity among respondents, namely with OR (odds ratio) of 10.66 (95% CI = 3.50 to 48.70). This means that people who have physical activity and inactive categories likely to have central obesity 10.66 (rounded to 11) times greater than with people who have active physical activity

Discussion

Results of measurements carried out on 75 people PNS Bandar Lampung District Attorney's Office shows that 44 (59.1%) were experiencing central obesity. Central obesity rates are much higher when compared with the prevalence of obesity Riskesdas in 2013 which only reached 26.6%. Nevertheless, the results Elsa Sundari et al. (2015) showed that the incidence of central obesity in

Pekanbaru city community aged > 20 years to reach 63.4%. Similarly, the results of research and Vera & Naomi (2012) in 147 religious leaders in the city of Manado which found that 67.3% of them is suffering from central obesity.

Central obesity can occur because of changes in lifestyle, such as high consumption of alcohol, smoking, high use of fatty foods, low consumption of fruits and vegetables, and low physical activity. Also, the increase in age, gender, and socioeconomic status also allegedly associated with central obesity. Increased prevalence of central obesity has an impact on the emergence of various degenerative diseases. Central obesity is associated with the enhanced metabolic syndrome, atherosclerosis, cardiovascular disease, type 2 diabetes, gallstones, pulmonary function disorders, hypertension, and dyslipidemia.

Table 2 also shows that most respondents were successfully measured (60.0%) had a mental, emotional disorder. The results of this study do not differ from the effects of research and Widiyantini et al. (2014) which states that 60% of civil servants to the Secretary-General of the Ministry of Health of Indonesia experienced the level of moderate to severe stress.

The mental, emotional disorder is the same term psychological distress. These conditions are circumstances that would indicate someone had a mental change. In contrast to the severe mental disorder psychosis and schizophrenia, the mental, emotional disorder is a disorder that can be experienced by everyone in certain circumstances but can be restored to normal. This disorder may progress to more severe complications if not successfully addressed.

Further, amounted to 62.7% of all civil servants the State Attorney's Office Bandar Lampung successfully consume less fiber. Research in 2013 showed that 93.5% of people in Indonesia consumed less fruit and vegetables. This condition is described to us that the majority of respondents surveyed do not drink enough fiber. Vera & Naomi (2011) reported that 89 people (60.5%) of

religious leaders in the city of Manado consume fiber in the low category.

Vegetables and fruits are groups of foodstuffs as a source of vitamins and minerals that are vital for health, especially for adults and the elderly. Vitamins and minerals needed by the body to regulate metabolism and digestion, increase endurance, and maintain body tissues. Vegetables and fruits also are a source of fiber which is necessary to keep the balance of fat and blood sugar levels, as well as to facilitate the disposal of the remains of food in the intestine, and prevent cancer.

It was found that the majority of respondents (82.7%) had mild to moderate physical activity, only 17.3% that had severe levels of physical activity. Widiyanti et al. (2014) found that 29.6% of civil servants RI Secretary General of the Ministry of Health appears to have moderate to strenuous physical activity.

Regular physical activity is beneficial to regulate body weight and to strengthen the heart and vascular system. Physical activity and exercise have a significant role. Calories burned during practice, the more exercise, the more calories are lost. Calories indirectly affect the basal metabolic system. People sitting workday will decrease the basal body metabolism so that the energy that goes in part will be stored as energy reserves. If this takes place on an ongoing basis will be congested in the body leading to obesity which can lead to various degenerative diseases.

Chi-square test showed that statistically there is a significant correlation between the emotional, mental state of respondents with central obesity ($p = 0.045$). The results of this study do not differ from the results Rita Purnamasari et al. (2010) which states that there is a significant association between the mental condition of emotional (stress symptoms) with central obesity. Then the results Sugianti (2009) in three provinces (Jakarta, Gorontalo and North Sulawesi) also indicates that no real connection between the mental condition of emotional positive with central obesity.

A person who is experiencing symptoms of stress tended to consume excessive amounts of food (Kantachuvessiri et al., 2005). Hormonal changes in a person with depression or anxiety is also suspected to cause an increase in body fat deposition, especially in the abdominal area. Roberts (2007) found that depression can lead to increased cortisol secretion. Increased cortisol concentrations were related to the accumulation of abdominal fat. In people who are obese, tend to have higher cortisol concentrations. This is done by the body in an attempt to cope with stress, known as homeostasis. Increased cortisol in the body causes elevated insulin affecting the reward system in the brain (Asmadi, 2008). In the end, the combination of high cortisol, and calorie dense contribute to the distribution of visceral fat (Adam, 2007).

Emotional, mental disorders (stress) will affect the regular eating patterns that can lead to eating disorders.

This study also reveals statistically there is a significant association between fiber intake with the incidence of central obesity ($p < 0.05$).

Von Eyben (2003) stated that the increase in interventions to lower intake of vegetables and fruits high in fat and sugar. Increasing vegetable intake and fiber consumption may increase satiety, decrease energy intake and fat intake. The main contribution in weight control is to reduce energy intake and restrictions diet. Increasing fiber intake of 12 grams/day associated with a reduction in abdominal circumference of 0.63 cm within nine years (Koh-Banerjee et al. 2003). Fiber can limit energy intake by way of lower energy density and speed up the effects of satiety (WHO 2000). When someone consumes food that contains much fiber, then, the person will feel full faster. With the fiber then that person will chew longer, and it will stimulate saliva excretions (saliva) and gastric fluid more. This excessive secretion would cause the stomach feel full. Also, with fibers, absorption of nutrients (starch, sugar, protein, fat) is blocked, so that the amount to be oxidized to reduce the energy (Muchtadi, 2001).

In the digestive tract, soluble fiber binds bile acids (the end product of cholesterol) and then issued with feces thus higher consumption of soluble fiber (not digestible, but was sent home with feces), the more bile acids and fatty acids released by the body.

In this case, the fiber helps reduce cholesterol levels in the blood. Soluble fiber lowers blood cholesterol levels by 5% or more. Insoluble fiber found in fruits, vegetables, grains (wheat), can reduce levels of LDL cholesterol (Jafar 2011). Many studies suggest that the importance of fruit and vegetable consumption of various chronic diseases. Expenditures of fruits and vegetables can reduce the risk of metabolic syndrome through a combination of antioxidants, fiber, potassium, magnesium and other photochemical. Fruit and vegetable consumption is associated with decreased risk of coronary heart disease. Fruit and vegetable consumption lowers the risk of heart disease through a reduction in CRP concentration which is a marker of inflammation. In this study also demonstrated that use of a DASH (*Dietary Approaches to Stop Hypertension*) among others diet rich in vegetables and fruit have a beneficial effect on the incidence of metabolic syndrome. Mediterranean Lipoeto et al showed that a diet rich in fruits and vegetables lowers markers of inflammation and endothelial dysfunction. Consumption \geq five servings of vegetables and fruit a day is recommended to reduce the risk of chronic disease (Lipoeto, 2002).

Chi-square test results showed that statistically there was a significant association between the consumption of fat with central obesity. This is in line with Vera (2012) which states that there is a significant association between the use of fat with central obesity ($p = 0.030$). The research results are also consistent with Roselly (2008) that there was a significant relationship between obesity and fat consumption ($p = 0.044$). Koh-Banerjee et al. (2003) found a 2% increase in energy intake from trans fatty iso-caloric replace good fats (polyunsaturated fat) or carbohydrate was significantly associated with the increase in waist

0, 77 cm more than nine years ($P < 0.001$ for each comparison).

Fat is the body's largest energy reserves. Fat has a savory taste. High energy density which is owned by fat, which can lead to a positive balance and the excess will be stored in adipose tissue. The increased fatty tissue will improve leptin, so it has an influence on the regulation of energy balance and ultimately can lead to obesity (Pujati, 2010). In the bivariate analysis between physical activity and central obesity, variable physical activity grouped merely into 2 (two) categories, namely inactive (a combination of mild to moderate physical activity) and On (equal to the weight of physical activity).

The results of *chi-square* analysis showed that there was a significant association between physical activity and central obesity ($p < 0.05$). These results are consistent with research Vera (2012) stating that there is a significant relationship between physical activity and central obesity ($p = 0.000$). Energy use varies in physical activity and different occupations. Physical activities will burn off some energy in the body that calorie intake into the body is not equipped with excessive physical activity will cause obese. In practical terms, it can be said that physical inactivity is a significant risk factor of obesity and obesity, although the cross-sectional study only found a relationship *moderate* between levels of physical activity with obesity (Widiantini 2014). Physical activity can lower waist size as closely related to a decrease in the percentage of body fat, especially visceral fat. The inactive lifestyle and a low level of activity are one of the leading factors of obesity (Tiala et al., 2013; Nisa & Fikawati, 2013).

Physical activity is an activity that can be done to contribute to *the total energy* expenditure. Physical activity, weighing more than 0.5 hours per day can lower abdominal circumference of 0.91 cm. In addition to physical activity in performing daily work, an increase in *total energy expenditure* can be done with intense practice and regular frequency. Regular exercise with a

duration of 370 minutes per week in men and women 295 minutes per week can reduce the risk of central obesity in a person (Koh-Banerjee et al. 2003).

Conclusion

From these results, it can be concluded that:

1. A total of 44 (59.1%) of civil servants the State Attorney's Office Bandar Lampung measured are known to have central obesity.
2. There was a significant association between the mental condition of emotional ($p = 0.045$), fiber consumption ($p = 0.004$), fat intake ($p = 0.000$) and physical activity ($p = 0.041$) with central obesity,
3. physical activity is a factor that is most dominant in touch with the incidence of central obesity respondents ($p = 0.011$; OR = 10.66; 95% CI = 3.50 to 48.70)

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