

## Factors are Associated with Central Obesity in Adult Men Indonesia (Riskesdas 2018 Data Analysis )

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### Abstract

The prevalence of central obesity in Indonesia based on the results of Basic Health Research (Riskesdas) in people aged  $\geq 15$  years has always shown an increase over time. The increase in obesity is closely related to non-communicable diseases so that it has an impact on the morbidity and mortality rates of obesity which are also getting higher. The cause of increasing central obesity is due to lifestyle changes, such as high alcohol consumption, smoking behavior, and low physical activity.

The design of this research was observational analytic with cross sectional research method. The study was conducted using secondary data from Riskesdas 2018 data analysis and data processing was carried out at the Faculty of Medicine, University of Lampung.

There is a relationship between smoking behavior (OR = 0.685) and physical activity (OR = 1.758) with central obesity in adult men aged 45-64 years in Indonesia, but there is no significant relationship between alcohol consumption habits.

There is a relationship between smoking behavior and physical activity with central obesity in adult men aged 45-64 years in Indonesia in 2018 and there is no relationship between alcohol consumption habits and central obesity in adult men aged 45-64 years in Indonesia 2018.

**Keywords:** central obesity, smoking, alcohol, physical activity

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### I. Introduction

The development of science and technology has an impact, one of which is the change in lifestyle and physical activity of the community. This change brings a new phenomenon to health problems in Indonesia, which is marked by the proliferation of various degenerative and non-communicable diseases. Obesity is an early signal for the emergence of other degenerative diseases (1).

Obesity is a major health problem in facing two disease burdens, namely the high incidence of infectious and non-communicable diseases such as obesity, diabetes, cardiovascular disease and cancer (2).

Obesity (excess nutrition) is a state of accumulation of excess fat in the body. Meanwhile, central obesity or android or visceral obesity is the accumulation of excess fat which is concentrated in the abdominal or abdominal area. Accumulation of fat in the body's visceral fat tissue is a form of malfunctioning subcutaneous fat tissue in the face of excess energy due to fat consumption that exceeds normal limits. The basic mechanism from being overweight to obesity is due to an imbalance between energy intake and energy output. Central obesity is measured by the waist-to-hip ratio (RLPP) method. The limitation for determining the status of central obesity is LP > 90 cm for men and LP > 80 cm for women. Central obesity is a trigger for other degenerative diseases such as type 2 diabetes mellitus, dyslipidemia, coronary heart disease, hypertension, cancer and metabolic syndrome (3).

Obesity is a central public health problem and is increasing rapidly throughout the world in line with the development of advances in science and technology. The prevalence of central obesity in developed countries such as the United States has increased from 39.6% (2015-2016) to 42.4% (2017-2018) and the highest prevalence in the United States is at the age of 40-59 years (4).

In the UK, the prevalence of obesity has also increased by almost 2-3 times over 20 years. In 1980, the prevalence of central obesity was 6% in adult men and 8% in adult women. Then in 2000 it increased to 21% of

the adult population in the UK. It is interesting that in the UK in recent years the prevalence of obesity in adult men and women has not been much different (5).

Central obesity problem is not only a world problem but also Indonesia. The number of people with central obesity in Indonesia reaches 692,007, placing Indonesia in 10th place in the world. The prevalence of obesity in Indonesia based on the results of Basic Health Research (Riskesdas) for a target age  $\geq 15$  years shows an increase over time, from 18.8% (in 2007) to 26.6% (in 2013), then in 2018 it also experienced an increase to 31%. The highest proportion of central obesity rate in Indonesia was in North Sulawesi (42.5%) then DKI Jakarta (42%), while the lowest central obesity rate was in West Nusa Tenggara (19.3%). The increase in obesity is closely related to non-communicable diseases which will have an impact on increasing health financing as well as obesity morbidity and mortality (6).

Central obesity is caused by lifestyle changes, such as high alcohol consumption, smoking behavior, consumption of high fat foods, high consumption of fast food, and low physical activity. In addition, increasing age, gender differences, and socioeconomic differences are also associated with obesity (7).

Hendrik L. Blum's classical theory states that 4 factors affect health, namely lifestyle factors, environmental factors, health care factors, and genetic factors. The four factors interact and affect a person's health status. In central obesity, there are several factors that influence, namely environmental factors, behavioral factors, and genetic factors. Behavioral factors as components that affect health encourage a person's attitude in consuming daily food which in turn will have an impact on the occurrence of central obesity. Other forms of behavioral factors such as inadequate physical activity, unhealthy diet, insufficient consumption of fiber (fruits and vegetables), and drinking alcohol are major risk factors for obesity (8).

Research on the effect of smoking, drinking alcohol, and physical activity on central obesity in adult men in Indonesia uses riskesdas 2018 data. This study uses a large sample size so as to explain the relationship between smoking, drinking alcoholic beverages, and physical activity with central obesity and generalizations circumstances. Indonesia.

The purpose of this study was to explain the relationship between smoking behavior, alcohol consumption habits, and physical activity with central obesity in adult men in Indonesia.

## II. Method

This research is part of the 2018 Basic Health Research, using observational analytics with a cross-sectional research design. Data sources from Riskesdas 2018 data on the comments contained in the questionnaire (smoking status in adult men, smoking frequency in adult men, drinking habits of alcohol, and individual characteristics (age, gender, and physical activity) and central obesity. Riskesdas 2018 data obtained from 34 provinces, 416 districts, and 98 cities in Indonesia. The total number of data for males aged 45-64 years was 713,783 people who met the inclusion and exclusion criteria.

## III. Results

Central obesity is a condition in which there is accumulation of excess fat which is concentrated in the abdominal or abdominal area. A person is said to be central obesity if the abdominal circumference (LP) is  $> 90$  cm for men and abdominal circumference (LP)  $> 80$  cm for women (3). In Indonesia, the picture of central obesity in adult men aged 45-64 years in Indonesia is as follows.

**Table 1. Distribution of Research Subjects**

Variable	Frequency	
	n	%
<b>Central Obesity</b>		
Yes	22.480	21,6
Not	81.798	78,4
Total	104.278	100
<b>Smoking Behavior</b>		
Yes	77.323	74,2
Not	26.955	25,8
Total	104.278	100
<b>Alcohol Consumption Status</b>		
Not a drinker	97.022	93,0
Heavy Drinkers	5.032	4,8
Medium Drinker	2.224	2,1
Total	104.278	100
<b>Physical Activity</b>		
Active	26.440	25,4
Less Active	77.838	74,6
Total	104.278	100

The results of the analysis in table 1 show that out of 104,278 adult males aged 45-64 years in Indonesia, 22,480 males (21.6%) have central obesity. Smoking behavior is an activity carried out by a person by burning and smoking cigarettes and can cause smoke that can be inhaled by those around him (9). Smoking behavior in adult males aged 45-64 years in Indonesia is 77,323 people (74.2%), while those who do not smoke are 26,955 people (25.85%).

Alcohol consumption behavior is the behavior of adult men aged 45-64 years who have consumed alcoholic beverages in the last 1 month. There are 2 categories of alcohol drinkers, namely moderate alcohol drinkers (if consuming alcohol <30 grams / day) and heavy alcohol drinkers (if consuming alcohol > 30 grams / day). Of the 104,278 adult males aged 45-64 years, there were 7,256 people (7%) who consumed alcohol in the last 1 month, while 97,022 people (93%) did not consume alcohol in the last 1 month. Of 7,256 people who consumed alcohol in the last 1 month, there were 2,224 people (30.7%) including moderate alcohol drinkers and 5,032 people (69.3%) including heavy drinkers.

Physical activity was categorized as active and less active. Adult males aged 45-64 years had much less activity than those who were less active, 77,838 people (74.6%) were less active and 26,440 (25.4%) active.

The relationship between smoking behavior and central obesity in men aged 45-64 years in Indonesia. Smoking behavior is included in the categories of never smoking (either every day or not every day) and not smoking. Analysis of the relationship between smoking behavior and central obesity in men aged 45-64 years in Indonesia showed that men with central obesity as smokers were 19.8% and 26.5% nonsmokers with a p-value <0.05.

**Table 2. The relationship between smoking behavior of alcohol drinkers and physical activity with central obesity in adult men aged 45-64 years in Indonesia**

Variable	Central Obesity				Central Obesity	p value	OR	95% CI (min - max)
	Yes		No					
	n	%	n	%				
<b>Smoking Behavior</b>								
Not a smoker	7.149	26,5	19.806	73,5	26.955	0.000	1,45	0,66 - 0,71
Smoker	15.331	19,8	61.992	80,2	77.323			
Total	22.480	21,6	81.798	78,4	104.278			
<b>Alcohol Drinkers</b>								
Moderate	1.122	22,3	3.910	77,7	5.032	0,187	1,09	0,96 - 1,23
Weight	465	20,9	1.759	79,1	2.224			
Total	1.587	21,9	5.669	78,1	7.256			
<b>Physical activity</b>								
Less active	7.711	29,2	18.729	70,8	26.440	0.000	1,76	1,70-1,82
Active	14.769	19	63.069	81	77.838			
Total	22.480	21,6	81.798	78,4	104.278			

Alcohol consumption behavior is the behavior of adult men aged 45-64 years who have consumed alcoholic beverages in the last 1 month. There are two categories of alcohol drinkers, namely moderate alcohol drinkers (if consuming alcohol <30 grams / day) and heavy alcohol drinkers (if consuming alcohol > 30 grams / day). Analysis of the relationship between alcohol consumption and central obesity showed that central obesity as a moderate alcohol drinker was 20.9%, while heavy alcohol drinkers were 22.3%. The results of statistical tests showed that there was no significant relationship between alcohol consumption and central obesity (p-value > 0.05).

Physical activity is any activity that stimulates a person to do physical activity as a whole, so this variable aims to reflect how the respondent's activity is described. The activity was categorized as active and less active. Analysis of the relationship between physical activity and central obesity in adult men aged 45-64 years in people with central obesity and active category was 19%, and in the less active category it was 29.2%. The results of statistical tests showed p value = 0.000, which means physical activity and central obesity showed a significant relationship (p <0.05).

#### IV. Discussion

Central obesity problem is not only a world problem but also Indonesia. The number of people with central obesity in Indonesia reaches 692,007, placing Indonesia in 10th place in the world. The prevalence of obesity in Indonesia based on the results of Basic Health Research (Riskesdas) in people aged ≥ 15 years has always shown an increase over time, namely 2007 (18.8%), 2013 (26.6%), then 2018 (31%). . If viewed by province, the highest proportion of central obesity rates in Indonesia is North Sulawesi (42.5%), then DKI Jakarta (42%), while the lowest is West Nusa Tenggara (19.3%). The increase in obesity is closely related to non-communicable diseases, so it is likely to have an impact on increasing health financing with higher obesity morbidity and mortality rates (6).

The mechanism of obesity itself is caused by an imbalance between incoming and outgoing energy,

resulting in accumulation of spare fat in the body. In general, obesity can be determined by calculating the Body Mass Index (BMI), but this indicator is considered less sensitive in describing the risk of cardiovascular and metabolic disorders that may occur. The indicator that is considered more sensitive is the measurement of the abdominal circumference. This is based on the fact that BMI cannot differentiate between fat mass and free fat mass. Meanwhile, the abdominal circumference describes the accumulation of fat that has accumulated in the midsection. This occurs because when subcutaneous fat cannot receive excess energy due to excessive fat consumption or perhaps due to other factors, namely lifestyle changes such as low physical activity, smoking behavior, and also alcohol consumption, fat accumulation occurs in the midsection (visceral fat) (10).

From Table 2 it is known that adult men aged 45-64 years have non-smoking behavior as the main cause of obesity compared to men who smoke. The results of the data obtained indicate that there is a significant relationship between smoking behavior and central obesity in adult males in Indonesia with a significance value <0.05 (p-value = 0.000). This is due to the dual effect of smoking, namely the nicotine contained in cigarettes plays a role in suppressing hunger and also plays a role in increasing energy expenditure by increasing the metabolic rate which is a chronic state of nicotine use that can have an impact on change. in the body mass in dex (BMI). ) and visceral fat accumulation (11,12).

Research conducted by Puspitasari N (2018) states that smoking is a central protective factor for obesity compared to respondents who do not smoke in Plalangan Village, Semarang. This may be because smokers have higher plasma cortisol concentrations than nonsmokers. Cortisol plays a role in influencing visceral fat and regulating metabolism. High plasma cortisol is a consequence of the sympathetic nervous system being affected or stimulated by smoking. The visceral mass of the body can increase due to several reasons, one of which is the decrease in the male hormone testosterone. The decrease in the male hormone testosterone is caused by smoking (13). The prevalence of central obesity is much higher in respondents who do not smoke compared to respondents who smoke (14).

Alcohol consumption with central obesity indicates that these two variables do not have a significant relationship with a p-value of 0.187 (p-value > 0.05). The difference between moderate and heavy drinkers was only 1.4%, (for heavy alcohol drinkers with central obesity 22.3% and for moderate alcoholic drinkers with central obesity 20.9%). This is very possible because of the interaction of other factors, one of which is physical activity.

Physical activity plays an important role in reducing abdominal fat accumulation, thereby reducing the risk of central obesity (15). The results of the cross tabulation test between alcohol drinkers who were centrally obese in adult males aged 45-64 years who did not do physical activity showed a relationship with a risk value (OR) of 1.298.

**Table 3. Relationship between Alcohol Consumption and Central Obesity in Adult Men Age 45-64 Years in the Less Physical Activity Group in Indonesiaa**

Alcohol Drinkers Category	Central Obesity				Central Obesity	P value	OR	95% CI (min - max)
	Yes		No					
	n	%	n	%				
Moderate	321	32,4	670	67,6	991	0,041	1,298	1,011 – 1,667
Weight	117	27	317	73	434			
Total	438	30,7	987	69,3	1.425			

A person who performs regular physical activity has been shown to substantially reduce body fat because physical activity can increase fat-free tissue mass and decrease fat tissue mass (16).

The human body when digesting alcohol is similar to when the body digests fat, which causes the calories that enter the body to also be high (increase). Alcohol can cause an increase in triglyceride levels in the body, especially in the liver and muscles which in turn can cause an increase in free fatty acids and glucose in the blood which results in insulin resistance and the secretion of the hormone adipokine which plays an important role. in energy balance and metabolism. The amount of glucose intake is too much and is not balanced with energy expenditure, there will be an imbalance between the energy in and out. The excess energy will be stored in the form of fat reserves in the body which then results in the accumulation of excess fat in the central (abdominal) adipose tissue (17).

Physical activity is any movement that results from working the skeletal muscles and increasing energy and energy expenditure. The risk of central obesity can be reduced if physical activity is carried out properly and regularly because physical activity is very important in reducing visceral fat accumulation. Conversely, if physical activity is lacking, it tends to make it easier for a person to save a lot of calories, causing energy accumulation and leading to weight gain and can also lead to central obesity (18).

Sufficient physical activity contributes to a decrease in the accumulation of fatty tissue in a person's body. This is because physical activity can increase fat-free tissue mass. On the other hand, if a person's physical activity is low or lacking, it will certainly contribute to increased fat deposits in the body because the food that enters the

body is not burned and converted into energy, but only stored in the body as body fat (13).

Physical activity can be done anywhere and in various situations, such as actively moving around the house, at work, in public places, while traveling. Physical activity can be done at least 30 minutes per day at moderate intensity and done consistently every day to get health benefits (19).

In this study, there are several limitations, including secondary data, so that researchers are only limited by the available data.

## V. Conclusion

There is a relationship between smoking behavior and central obesity in adult men aged 45-64 years in Indonesia in 2018. There is no relationship between alcohol consumption and central obesity in adult men aged 45-64 years in Indonesia in 2018. There is a relationship between physical activity and obesity Central in adult males aged 45-64 years in Indonesia in 2017. For the community, it is better if people start implementing healthy habits from an early age, including not smoking, not consuming alcohol, and doing enough physical activity. activities, namely 30 minutes per day to avoid degenerative diseases such as obesity, central obesity, diabetes mellitus, and others. For future studies with the same theme, it is worth examining more specific variables such as smoking status, classification of physical activity, or it may be possible to study the factors affecting central obesity in women.

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