

Association of Major Dietary Pattern With Central Obesity in Bantul Districts

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ABSTRACT

Background: Central obesity is the accumulation of fat in the body of the abdomen due to malfunction of subcutaneous adipose tissue in the face of an imbalance of energy into the body. Central obesity was measured using indicators that a female abdomen circumference > 80 cm, and the man that is > 90 cm. In individuals with central obesity have a tendency carbohydrate consumption level is higher than non-obese individuals central. Excessive consumption of carbohydrates in the body will be converted into fat by the liver. These will be stored body fat in unlimited quantities and will result in the emergence of central obesity.

Objectives: This study aimed to investigate the relationship between patterns of staple food consumption with the incidence of central obesity in Bantul Districts.

Methods: This research is an observational research with cross-sectional study design form. This study was conducted in Bantul district in January-March 2019. The population in this study are households with a large sample of 81 households and 187 respondents of the study subjects. Staple food consumption pattern data obtained by interview questionnaire menggunakan food list, central obesitass dieproleh with abdominal circumference measurement. This study uses bivariate test *Fisher's Exact* p value of <0.05.

Results: From the total 187 most respondents with central obesity and the number of staple foods or less by 70 respondents (44.0%) p value 0.301. From a total of 81 households in this study most households central obesity and the number of staple foods in excess of 53 households or (82.8%) p-value of 0.021. Based on the characteristics of the test sample is known that there are differences in the characteristics of the study sample that physical activity and occupation of household head.

Conclusions: There is no association between the consumption patterns of staple foods with central obesity. Physical activity and occupation of household head can be another factor of central obesity.

Keywords: *Food Consumption Patterns, Central Obesity*

INTRODUCTION

Central obesity is a nutritional problem that exists in the community. The prevalence of central obesity in Indonesia has increased in many years. Based on the results Riskesdas 2007 amounted 18.8% to 26.6% in 2013 and the year 2018 of 31.0% (1). The proportion of central obesity in adults ≥ 15 years in Yogyakarta is 32%, where this number exceeds the prevalence of national central obesity of 31% (1). While in Bantul regency the prevalence of obesity in 2016 amounted to 39.55% (2). Central obesity is measured using the female abdominal circumference indicator > 80 cm, and the man is > 90 cm (1). Central obesity is one of the closest indicators to predict whether there is a metabolic syndrome than obesity in general.

In individuals with obesity has a tendency to consume energy consumption levels of carbohydrates higher than non-obese individuals (3). Excessive consumption of carbohydrates will be transformed into fat by the liver. This fat that will be stored in an unlimited amount of body. This is what can cause the consumption of carbohydrates can increase the amount of fat deposits in the body that will result in the emergence of central obesity. In addition, excess consumption of carbohydrates will cause a person to be exposed to type 2 diabetes mellitus. One of the food sources of carbohydrate is staple food (4).

Therefore, research needs to be done related to the relationship of basic food consumption pattern with the incidence of central obesity in Bantul Districts.

MATERIALS AND METHODS

This research is a quantitative descriptive with a cross-sectional or latitude-related research plan. Cross-sectional Research plan is a data collection activity that is done at a certain time and Lot research body is only done one time data retrieval. This research was

conducted in Bantul Regency precisely in the district of Pity, Sedayu, Sanden, Banguntapan, and Jetis. This research will be conducted in January-March 2019. The population in this study is all households in Bantul regency involving family members in the household. The number of samples in this study was 81 households involving family members ≥ 15 years (1).

The research instrument used is the approval information when requesting the willingness of respondents to participate as a research body. Self-identifying questionnaire for the characteristics of sample research (each gender, age, last education, moderately). Food list questionnaires are used to mengathui the consumption pattern of household staple dishes. Physical activity using GPAQ questionnaire. Food List data obtained hereinafter converted using food photo book and inserted into NutriSurvey. Then the data is processed using UNIVARIIC and bivariate statistics. First conducted normal data distribution normality test using SPSS 16.0 by conducting Kolmogorof-Smirnov test. Bivariate analysis in this study using Fisher's EXACT test was the assumption that the Chi-Square test was not fulfilled.

This research was approved and Kokoro Certificate of Ethics (Ethical clearance) from the University of Alma Ata Yogyakarta Ethics Commission with letter number KE/AA/1/759/EC/2019. And Kokoro Research recommendations recommendation of research permit from BAPPEDA (Regional Development Agency) Bantul Regency with letter number 070/reg/0145/S1/2019. The research team at the time of collecting data on the field were assisted enumerator for 4 people to conduct interviews and abdominal circumference and the filling of questionnaires. With the liquid enumerator criteria of the nutritional student of semester 7 which passed the fundamental matakulia nutritional practice researchers give explanation about the research procedure and equate perception to the enumerator of research.

RESULTS

Univariate Analysis

Sample Research characteristics

Table 1. Distribution characteristics of research samples

Variable	n	%	P (Run Test dan Binomial test)
Gender			
Male	89	47.6	0.559
Female	98	52.4	
Father's Job			
Not working	4	2.1	0.008
Employees	10	5.3	
Self employed	21	11.2	
Farmer/Fisherman/Labour	42	22.5	
Other	3	1.6	
Mother's job			
Not working	37	19.8	0.728
Employees	6	3.2	
Self employed	13	7.0	
Farmer/Fisherman/Labour	17	9.1	
Other	2	1.1	
Family Head Education			
No School	6	3.1	0.198
Not finished SD/MI	0	0	
Graduated SD/MI	16	8.6	
Junior High School/MTS	15	8.0	
Senior High School/MA	32	17.1	
Diploma (D1-D3)/Bachelor, Magister/Doctor	11	5.9	
Mother's Education			
No School	5	2.7	0.307
Not finished SD/MI	3	1.6	
Graduated SD/MI	18	9.6	
Junior High School/MTS	13	7.0	
Senior High School/MA	27	14.4	
Diploma (D1-D3)/Bachelor, Magister/Doctor	9	4.8	
Age of respondents			
13-15 years and above	6	3.2	0.301
16-18 years and above	5	2.7	
19-29 years and above	27	14.4	
30-49 years and above	70	37.4	
50-64 years and above	64	34.2	
65-80 years and above	15	8.0	
> 80 years	0	0	

Variable	n	%	P (Run Test dan Binomial test)
Physical Activity			
Sell	117	62.6	0.001
Enough	70	37.4	

Descriptions of the sample characteristics in this study are presented in **Table 1**. The research sample amounted to 81 households with subjects of 187 respondents. Most of the gender of the respondent is females 98 (52.4%). The work of the family head is largely employed as a farmer/fisherman/labour of 42 (22.5%), while the work of the mother is largely not employed or as a housewife 37 (19.8%). Family head education and maternal education are mostly educated graduate Senior High School/MA. Most of the respondents were 30-49 years old for 70 (37.4%). Most of the respondents were 117 (62.6%) Low activity, while 70 (37.4%) The respondent performs considerable physical activity.

The binomial test and run test are conducted to determine whether there are any differences in the sample characteristics that can affect the dependent variables in this study. Based on a different test Run Test and Binomial Test is known that there are no differences in gender characteristics ($p=0.559$), maternal work ($p=0.728$), education head of the family ($p=0.198$), education mother ($p = 0.307$) and age ($p=0.301$). While on the characteristics of the work of the family head ($p=0.008$) and physical activity ($p=0.001$) there are different characteristics of research samples.

Univariate Analysis o Staple Food Consumption Patterns with Central Obesity.

Tabel 2. Univariate analysis o staple food consumption patterns with central obesity

Variable	n	%
Type of Staple Food		
Cereal	65	34.8
Bulbs	0	0
Cereal & Bulbls	122	65.2
The Amount of Staple Food		
More	28	15
Less	159	85

Variable	n	%
Central Obesity		
Yes	79	42.2
No	108	57.8

Based on **Table 2**, it is known that it is very easy to make the main food of respondents, cereals and tubers of 122 respondents or (65.2%) of a Total of 187 respondents. As for the number of staple food makes it easier for respondents included in the category less than 159 respondents or (85%) of a Total of 187 respondents. The amount of consumption of staple foods is said to be lacking when the adequacy of carbohydrates consumed less than the Nutritional Adequacy Rate (AKG), otherwise it is said more if the carbohydrates consumed more are compared with Nutritional Adequacy Rate (AKG) (5).

According to **Table 2** It is known that the large ease of respondents in the study did not suffer central obesity of 108 respondents or (57.8%) of a Total of 187 respondents in this study. Central obesity is measured by measuring the respondent's abdominal circumference using metlin. Respondents were said to be central obesity when men >90 cm, women >80 cm (1).

Analysis of univariate of basic food consumption pattern and domestic obesity of household.

Table 3. Analysis of univariate basic food consumption pattern and domestic obesity of household.

Variable	n	%
The Amount of Staple Food		
More	60	74.1
Less	21	25.9
Central Obesity		
Yes	62	76.5
No	19	23.5

According to **Table 3** It is known that the large-ease households in this research are included in the Konsumi pattern of staple food of 60 households or (74.1%) of the Total 81 households in this study. The pattern of consumption of household staple food is known by how the Total staple food consumption pattern is compared with the total Nutritional Adequacy Rate (AKG). It is said that less if the total food consumption of tangg houses are smaller than the AKG, otherwise it is said more if the total household food consumption more than AKG (5).

Based on **Table 3** known from Total 81 households in this study made it easier for households to be included in central obesity of 62 households or (76.5%). The central obesity of households is categorized as central obesity when in one household there is a member of the family that has a efficacy into the central obesity category. Instead, households are not experiencing central obesity when in one household there are no snetral obese family members.

Bivariate Analysis

Relationship pattern consumption of staple food with the occurrence of central obesity.

Table 4. Relationship pattern consumption of staple food with the occurrence of central obesity

The amount of staple food	Central Obesity				p	OR (95%CI)
	Yes		No			
	n	%	n	%		
More	9	32.1	19	67.9	0.301	0.602 (1.4-0.2)
Less	70	44.0	89	56.0		

According to **Table 4** It is known that from a total of 187 respondents to this study were mostly with central obesity and the number of staple foods was less than 70 respondents or (44.0%). The same is also the case for most respondents who do not experience central obesity and the amount of staple food is less than 89 respondents or (56.1%). The results of bivariate analysis showed that there is no relation between the consumption pattern of staple food with the incidence of central obesity with the value of P value 0.301 and has a value of OR 0.602 (95% CI 1.4-0.2).

In this research there is no relation between the consumption pattern of staple food and the incidence of central obesity because there is no characteristic difference between central obesity respondents and not central obesity with the characteristic number Staple food. Where the respondents central obesity and not central obesity enter into the category of the number of staple food less.

The test characteristics of research samples with dependent variables

Table 5. Test characteristics of research samples with dependent variables

Category	Central Obesity				p	OR (95%CI)
	Yes		No			
	n	%	n	%		
Physical Activity					0.001	2.825 (5.3-1.4)
Sell Enough	60	51.3	57	48.7		
Gender					0.000	0.154 (0.297-0.080)
Male	18	20.2	71	79.8		
Female	61	62.2	37	37.8		

According to **Table 5** it is known that from Total 187 respondents in this study make it easier for respondents with the characteristics of physical activity Sell and central obesity of 60 respondents or (51.3%). Meanwhile, the respondent with adequate physical activity and not experiencing central obesity amounted to 51 respondents or (72.9%). The results of binomial analysis of Test Products that there is a characteristic differences in the physical activity of the respondent can trigger central obesity with the yield value of Bivarat p of 0001 and Value or 2.825 (95% CI 5.3-1.4).

In this research differences characteristics of physical activity of respondents make it easier to Sell included so that it can trigger central obesity. Results of OR products that respondents with physical activity Sell 2.825 times more risky to have central obesity.

According to **Table 5** it is known that it facilitates large female respondents and central obesity of 61 respondents or (62.2%). While the male respondents made great ease and did not suffer central obesity by 71 respondents or (79.8%). Although based on binomial Test there are no characteristics of respondents, but based on the results of bivariate known female respondents have a higher central obesity risk than male respondents with a value of 0.154.

Relationship pattern consumption of staple food with central obesity of households.

Table 6. Relationship pattern consumption of staple food with central obesity of households

The Amount of Staple Food	Central Obesity				p	OR 95%CI
	Yes		No			
	n	%	n	%		
More	53	82.8	11	17.2	0.021	4.283
Less	9	52.9	8	47.1		(13.56-1.35)

Based on Table 6 It is known that from a total of 81 households in this study mostly central obesity households and the number of staple food was more than 53 households or (82.8%). While households with central obesity and the number of staple foods are less than 9 households or (52.9%). In households that are largely not with central obesity and the number of staple foods is more than 11 households or (17.2%). The results of bivariate analysis showed that there is a link between the dietary consumption pattern and household obesity. Evidenced by the value of P value 0.021 ($p < 0.05$) on the Fisher's Exact test and the value OR 4.283 (95% CI 13.56-1.35).

In this research, there is a relationship between the basic food consumption pattern and household obesity. This is because most households with central obesity and have a number of staple food patterns more than AKG more than households with central obesity and have less staple food than AKG. The OR results show that households with a total staple food of AKG 4.283 times more at risk of snetral obesity, compared to households with less staple food than AKG.

DISCUSSION

Sample Research Characteristics

The subjects used in this study were 187 respondents from 81 households with criteria of inclusion of age ≥ 18 years. Based on the univariate analysis it is known that most of the respondents were females 98 (52.4%). The work of the family head is largely employed as a farmer/fisherman/labour of 42 (22.5%), while the work of the mother is largely not employed or as a housewife 37 (19.8%). Family head education and maternal education are mostly Educated Graduate School/MA. Most of the respondents were 30-49 years old for 70 (37.4%). Most of the respondents were 117 (62.6%) Low

activity, while 70 (37.4%) The respondent performs considerable physical activity.

In this study, tests of characteristics of respondents could affect the dependent variables. Note that there are no differences in gender characteristics ($p=0.559$), maternal work ($p=0.728$), Family head education ($p=0.198$), maternal education ($p=0.307$) and age ($p= 0.301$). While on the characteristics of the work of the family head ($p=0.008$) and physical activity ($p=0.001$) there are different characteristics of research samples.

Based on the results of univariate is known that most types of staple foods are cereals and tubers amounting to 122 respondents or (65.2%) Of a total of 187 respondents. As for the number of staple food most of the respondents belong to the category less than 159 respondents or (85%) Of a total of 187 respondents. Most of the respondents in the study did not suffer central obesity by 108 respondents or (57.8%) Of a total of 187 respondents in this study. Of the total of 81 households in this study it is known that most households in this study included a pattern of consumi staple food of more than 60 households or (74.1%). Most households included in central obesity of 62 households or (76.5%).

Based on the results of the statistical test is known that there is no connection between the dietary consumption patterns of central obesity with the value of P value 0.301 ($p > 0.05$). Whereas, statistical test result of the relationship of basic food consumption pattern with the occurrence of central obesity households showed significant results with the value of P value 0.021 ($p < 0.05$). In addition to the basic food consumption pattern, based on the results of the test Binomial Test and Run Test, there is another factor that can trigger the occurrence of central obesity in a person that is physical activity with the value of p-value 0.001 ($p < 0.05$) and the head work family with a value of p-value 0.008 ($p < 0.05$).

Consumption Pattern of Staple Food with The Occurrence of Central Obesity

Based on the results in this research can be noted that the picture of the consumption pattern of the respondent with central obesity is largely entered into the category of less. It is inversely proportional to the statistical results of the food consumption pattern with the central obesity of households that show that most of the households with central obesity have excess staple food compared to with AKG.

According to **Table 4** it is known that there is no relation between the consumption pattern of staple food with the incidence of central obesity in Bantul regency with the value of p-value 0.301. In this study there was no significant link because the respondents of central and normal obesity had less basic food consumption patterns compared to AKG.

It is unrelated because a person who is experiencing central obesity tends to have excessive carbohydrate consumption. This is because excess carbohydrate that are not converted into energy will be stored in the form of glycogen and fat. Glycogen will be stored in the liver and muscles, while the fats will be stored around the stomach, kidneys and skin that. This is what causes individuals who experience excess karbohidarat will experience central obesity (6). Conversely a person with a staple amount less than 15% of the calories is more likely to experience weight loss than experiencing central obesity (7). Because in someone who is experiencing a carbohydrate deficiency then the existing energy will be used continuously and does not cause a pile of fat in adipose tissue.

This is in line with the research conducted by Sasmito (2015) stating that there is no connection between the intake of carbohydrate substances with central obesity (8). The same results were also reported by Usti (2018) stating that there is no significant link between the intake of karhohydrous with the incidence of central obesity (7). This is because central obesity can be caused by several other factors in addition to the basic food consumption pattern (9). According to Mustamin (2010) The main factor of the central obesity is Ineffective energy use so that it is buried in fatty tissues or adipose tissue. The body will automatically store excess calories in the form of fat, but the excess calories that occur continuously result in increased fat production so that the body is obese (10).

However, this is not in line with some previous studies stating that the consumption patterns of high carbohydrate foods have significant effect on central obesity. According to Handesti (2017) There is a meaningful relationship between the intake of carbohydrates with central obesity (11). The same results are also reported by Aprilia (2017) stating that there is a meaningful link between intake of carbohydrates and obesity (12).

The results of the research also differ from the results of the consumption pattern of basic food with household obesity. Where there is a significant link between the amount of consumption of staple

food with the central obesity of households. In this research the household with more basic food than AKG has the tendency that in the same household there are members of the family who are experiencing central obesity. Where households with the amount of staple food are more risky 4.283 times to have snetral obesity on family members.

This relates to the characteristics of a sample of research in which there are differences in the characteristics of family head work, this difference can cause central obesity in households. This relates to the socio-economic of the household. Household ability to buy, providing up to consume food will depend on household income. Where household income is largely obtained from the family head. It is supported by the results presented **Table 1** where most of the mother's work is not working so it can not generate income, and most of the income in the household is obtained from the head of the family with most Working as a farmer/fisherman/worker. Household income will affect domestic expenditure on choice and purchase of groceries. The high cost of food in households will have an impact on the high consumption of groceries that can cause obesity (13). Households with low socio-economics tend to have more feeding ingredients than healthy (14).

In addition to the family head work, according **Table 1** is known that physical activity can trigger central obesity. Supported by a statistical outcome indicating that a person with low physical activity is 4.283 times more risky to have central obesity. If in one household there is one member Families who lack physical activity and consume excessive carbohydrates will trigger the central occurrence of obesity. In line with the results reported by Pujiati (2010) stating that there is a link between physical activity and central obesity (15). It is also in line with the results of research conducted by Ladabaum (2014) stating that there is a connection between physical activity and the incidence of central obesity in the people of Ayuning (16).

In this research make it easier for household members who are women with enough mothers who do not work. Not working can trigger physical activity of a Sell that can not burn energy when the body has excess booster intake carbohydrate. If it lasts long then it will experience a buildup of fat in adipose tissue. Women will have the risk of having a higher central obesity than men. This is due to the difference between physical activity and amount of energy intake consumed. Housewives are susceptible to having a less healthy Life Style. Where

the activities undertaken by housewives make it easier for the liquid activities to be done indoors and do not need a lot of physical activity (17).

In this research the household with the characteristics of education level chief of the family and mother as a large graduated Senior High School/ MA. A person with graduate Senior High School/ MA education is included in the category of higher education (18). The eating consumption pattern of a person or household is closely related to the insight it has. The higher the level of education of a person then the knowledge of nutrition will be higher, moreover, the low education will trigger households get enough less decent (19). So in this research there is no characteristic difference in research samples based on education. So it can not be said that education can trigger central obesity, which is usually central obesity is more likely to be experienced households with the level of education of the head of family and mothers who Sell. Based on low education will cause nutritional knowledge that Sell so choose groceries only to filling.

The increasing age of a person the higher the risk of central obesity. Based on, a person who is older will experience a slowdown on metabolism and physical activity compared to a younger age. However, there are no differences in the research sample characteristics based on age. Where in this study facilitates a large sample of research 30-49 years old. A person with age 15-64 is the liquid age of the resident. The age of note is identified with the age of a person who has enough. So in this research there is no link between age as a trigger or factor of central obesity (20).

CONCLUSION

Based on statistical test results, there is no relation between the food consumption pattern and the central obesity event in Bantul Districts.

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