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A Relationship between Knowledge, Attitude, and Practice about Balanced Nutrition Guidelines and Metabolic Syndrome among Central Obese Teachers in Makassar

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ABSTRACT

Metabolic Syndrome prevalence increase included in the Asia Pacific. This study aimed to assess a relationship between knowledge, attitude, and practices about balanced nutrition guidelines and metabolic syndrome (Mets) in high school teacher with central obese. This was a cross-sectional study conducted in twelve high schools in Makassar city. Subjects were 129 teachers (28 men and 101 women) diagnosed with central obese. Knowledge, attitude, and practice (KAP) assessed by a validated questionnaire. Mets was defined by measuring blood glucose, blood pressure, HDL, triglycerides, and waist circumference. Those fulfilled three parameters or above were stated as Mets group, and others were stated as Risk group. KAP was categorized according to score and divided into low (Q1), moderate (Q2), and high (Q3). Chi-square test was used to assess the relationship. Subjects were mostly women (78,3%), Buginese ethnic (66,7%), and married (96,1%). KAP was distributed evenly to three categories for each variable. The relationship between Knowledge and Mets was borderline significant (p=0.093). There were not significantly different between attitude and Mets (p=0.406). However, there were significantly different between practice and Mets (p=0.016). These adequate knowledge and practice were higher in Mets group compared to Risk group. This study also showed some practices of balanced nutrition guidelines were very low whereas adequate consumption of vegetables and fruits (0.8%), adequate consumption of protein (25.6%), less consume a variety of staple foods (6.2%), less consumption of sweet, salty and fatty foods (2,3%), reading labels on food packaging (32,8%), and perform adequate physical activity and maintain a normal weight (28,2%). We conclude that the teacher in Mets group showed better knowledge and practice of balanced nutrition guidelines compared to Risk group.

Keywords: *Non-communicable diseases, developing countries, vegetables, and fruits.*

INTRODUCTION

Metabolic syndrome is a collection of metabolic disorders that can increase the risk of non-communicable diseases including heart disease and diabetes mellitus.[1] Metabolic disorders that including increasing fasting blood sugar, decreases HDL levels, increasing triglyceride levels, hypertension and central obesity, which having at least 3 of these parameters called Mets.[2] Data shows that there is an increase in the prevalence of Mets where 20-30% was an adult groups.[3]

Knowledge, attitudes and practices about nutrition that are lacking are the causes of the increasing risk of non-communicable diseases.[4,5] Knowledge is important in determining which foods will be chosen for consumption which will have an impact on health. Practicing proper nutrition can have a positive impact on various blood metabolic parameters.[6,7]

Balanced nutrition guidelines are a government effort to overcome various nutritional problems in Indonesia.[8] This guide contains 10 main messages, including messages related to food and the practice of

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clean and healthy living. The application of balanced nutrition messages is expected to be able to prevent an increase in non-communicable diseases in Indonesia.

South Sulawesi is the province with the highest prevalence of stroke in Indonesia where the main risk factor is Mets.[9] The study of the metabolic syndrome in Indonesia is still very little. Research on knowledge, attitudes and practices of balanced nutrition towards the metabolic syndrome has not been widely performed. This research will contribute to the provision of information, especially about the knowledge, attitudes and practices of balanced nutrition guidelines issued by the Indonesian Ministry of Health related metabolic syndrome in obese secondary school teachers in Makassar.[8]

MATERIALS AND METHOD

Research design: This was a cross sectional study design conducted in 12 secondary schools in the Makassar city. Of these, 386 people interviewed and measured their anthropometry (weight, height, waist circumference) for central obesity screening. As a result, 229 teachers experienced central obesity (59.3%). Only 151 teachers were willing to take blood (n = 72 negative responses). For analysis, we excluded samples who had been diagnosed with heart disease and diabetes mellitus (n = 22 people). The total number of samples we analyzed were 129 teachers (28 men and 101 women).

Knowledge, attitude and practice measure by validated questionnaire. Knowledge questionnaire (r= 0.790), attitude (r= 0.737), and practice (r= 0,769). Data was taken by nutrition students in Hasanuddin University Faculty of Public Health.

Metabolic Syndrome: Metabolic syndrome is defined by a joint interim of International Diabetes Federation Task Force on Epidemiology and prevention; National Heart, Lung and Blood Institute; American Heart Association; World Heart Federation; International Atherosclerosis Society; and International association for the Study of Obesity.[1] According to the definition, triglyceride levels ≥ 150 mg/dl, HDL < 40 mg/dl for men and < 50 mg/dl for women, fasting blood sugar ≥ 100 mg/dl, blood pressure ≥ 130/85 mmHg is said to be greater risk. Central obesity is determined by Asian ethnicity which is risky if ≥ 90 cm in men and ≥ 80 cm in women. Having 3 of this parameters categorized as metabolic syndrome group and other stated as risk group. Abdominal circumference is measured using the waist ruler of one Med Brand. Blood pressure is measured by using mercury tensiometer. HDL examination using homogenous enzymatic colorimetric assay method, triglyceride examination using enzymatic colorimetric, fasting blood glucose examination by HK method (Hexokinase).

The study was conducted in compliance with the Declaration of Helsinki. All of the procedures involving human subjects were approved by the Medical Ethics Research Board of Hasanuddin University (No. UH 16111123). Written consent was obtained from the participants before the study began.

Data analysis was performed using SPSS version 17. Descriptive analysis was conducted to describe the demographic condition of respondents, and bivariate analysis, to see the relationship between knowledge, attitudes and practice of balanced nutrition with metabolic syndrome.

RESULTS

There were 129 teachers who became respondents in this study. Most (78.3%) of respondents are women, and included in the bugis ethnicity (66,7%). Majority (92.4%) of respondents are Muslim with education was S1/S2/S3 (81.4%) and most (96.2%) of respondents had married status.

Table 1 shows the relationship between knowledge, attitudes and balanced nutrition practices with Mets. From table, it can be seen that there is a significant relationship between balanced nutrition practices and metabolic syndrome. (p= 0.016). Respondents who have high balanced nutrition practices experience more of the metabolic syndrome than those who have less practice (46.2% and 23.4%). Knowledge has a borderline relationship with the metabolic syndrome (p = 0.093) and there is no significant relationship with the metabolic syndrome (p = 0.406).

Table 2 shows that there are several messages of balanced nutrition guidelines which are still very poor practice, namely eat a plenty of vegetables and fruits (0.8%); adequate consumption of protein (25.6%); less consume a variety of staple foods (6,2%); less consumption of sweet, salty and fatty foods (2,3%); reading labels on food packaging (32,8%), and perform adequate physical activity and maintain a normal weight (28,2%). Knowledge and attitudes in all balanced nutrition guidelines are good (>60%).

Table 1: Relationship between knowledge, attitudes, practice of Balanced Nutrition Practices and METS

Variable	Metabolic syndrome (n = 52)		Risk Metabolic syndrome (n = 79)		p-value
	n	%	n	%	
Knowledge					
Low	15	35.7	27	64.3	0.093
Moderate	11	28.9	27	71.1	
High	25	51.0	24	49.0	
Attitude					
Low	20	45.5	24	54.5	0.406
Moderate	17	41.5	24	58.5	
High	14	31.8	30	68.2	
Practice					
Low	11	23.4	36	76.6	0.016
Moderate	22	51.2	21	48.8	
High	18	46.2	21	53.8	

Table 2: The correct answer from the components of Knowledge, attitudes, and balanced nutrition practices

Variable	Knowledge (n = 129)		Attitude (n = 129)		Practice (n = 129)	
	n	%	n	%	n	%
Be grateful and eat wide variety of foods	83	64.3	79	61.2	120	93.0
Eat a plenty of vegetables and fruits	121	93.8	101	78.3	1	0.8
Adequate consumption of protein	85	65.9	95	73.6	33	25.6
Get used to consume a variety of staple foods	97	75.2	99	76.7	6	6.2
Limit intake of sweet, salty, and fatty foods	96	74.4	89	69.0	3	2.3
Get used to breakfast	47	36.4	126	97.7	73	56.6
Get used to drink enough water and safe	77	59.7	105	81.4	91	70.5
Get used to reading labels on food packaging	81	62.8	117	90.7	42	32.8
Wash your hands with soap and running water	121	93.8	110	85.3	95	73.6
Perform adequate physical activity and maintain a normal weight	111	86.0	104	80.6	36	28.2

DISCUSSIONS

Balanced nutrition practices have a significant relationship with incident metabolic syndrome, while knowledge has a borderline relationship with the metabolic syndrome, and attitude was not significant related with incident of metabolic syndrome among Respondents. This research was conducted in a group of adults whose work was teacher. This group majority of education was quite high (S1/S2/S3 = 96.9%). Having higher education is related to high knowledge about health.[10,11]

Respondents having metabolic syndrome have high practice of balanced nutrition guidelines. Some respondents who are experiencing pain aware and willing to change their lifestyle, including in eating and physical activity.[12] This study was conducted in a group of teachers who have been detected as having central obesity so that balanced nutrition practices have mostly been carried out, although they have not shown positive results in the parameters of the metabolic syndrome.

This study has similarity result with a study conducted by O'Brien and Davis in Ireland. They found no relationship between knowledge and BMI. People who have obese have better knowledge of choosing food than people with normal BMI. This shows that knowledge is important, but does not directly affect behavior change.[13]

Balanced nutrition guidelines prepared by the Indonesian Ministry of Health in 2014 in an effort to reduce the prevalence of NCDs in Indonesia. This guide consists of 10 balanced nutrition messages namely be grateful and eat wide variety of nutritious foods; eat plenty of vegetables and fruits; get used to take side dishes that contain high protein; get used to consume a variety of staple foods; limit intake of sweet, salty and fatty foods; get used to breakfast; get used to drink enough water and safe; get used to reading labels on food packaging; wash your hands with soapy water and running water; perform adequate physical activity and maintain a normal weight.[8]

Balanced nutrition practice on each message is still very lacking. The habit of eating vegetables and fruit is quite the lowest practice. Consumption of 3 servings of vegetables and 2 servings of fruit a day is a sufficient condition in the message of balanced nutrition. Increasing consumption of vegetables and fruit can reduce the risk of various NCDs.[14] Eating unhealthy food is often done at work, including in the group of teachers.[15]

Another message that is still very lacking in practice is limiting the consumption of sweet, salty and fatty foods. Consumption of sweet, salty and fatty foods is associated with increased risk NCDs.[16] Our respondents was almost women that have preferred sweet foods.[17]

CONCLUSIONS

This study show metabolic syndrome related with practice of balanced nutrition guidelines. The results of this study can be used as a basic for developing educational media that emphasize balanced nutrition practices.

Conflict of Interest: There is no any conflict of interest within this study and publication

Ethical Clearance: Taken from Hasanuddin University Ethics Committee with number: 869/H4.8.4.5.31/PP36-KOMETIK/2017.

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