

DETERMINANTS OF OBESITY IN SCHOOL TEACHERS DURING THE COVID-19 PANDEMIC IN THE REGION OF CEMPAKA PUTIH WEST JAKARTA CENTER

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ABSTRACT

The COVID-19 pandemic (Coronavirus Disease-2019) is a virus of international concern, WHO has declared the COVID-19 pandemic a public health emergency. In Indonesia, one of the efforts to prevent and control COVID-19 is by means of Emergency PPKM. This PPKM policy causes changes in people's lifestyles such as decreased physical activity and changes in diet that can cause obesity. The prevalence of overweight and obesity has increased from year to year. The purpose of the study was to obtain the determinants of obesity in school teachers during the COVID-19 pandemic in the Cempaka Putih Barat sub-district, Central Jakarta. This study uses quantitative analysis with a cross-sectional design. The population of the study were teachers of SMP, SMA and SMK as many as 165 samples. The sampling technique is purposive sampling using a questionnaire. Data analysis using Chi-Square and Logistic Regression. Univariate results showed that 104 (63,03%) teachers were obese. The results of Chi-Square show that there are between eating patterns, knowledge, attitudes, actions, and genetics. While those that are not related to activity, level of estimation, gender, and age. The results of the multiple logistic regression test showed that there were five variables that were significantly correlated with obesity in teachers, namely actions, genetics, eating patterns, knowledge and attitudes. It is recommended for school teachers to change a healthy lifestyle during the COVID-19 pandemic to prevent the risk of obesity.

Keywords: physical activity, COVID-19, determinants, obesity, dietary habit

ABSTRAK

Pandemi COVID-19 (Coronavirus Disease-2019) merupakan virus yang menjadi perhatian dunia internasional, WHO telah menetapkan pandemi COVID-19 sebagai keadaan darurat kesehatan masyarakat. Di Indonesia sendiri salah satu upaya pencegahan dan penanggulangan COVID-19 dengan cara PPKM Darurat. Kebijakan PPKM ini menyebabkan terjadinya perubahan gaya hidup masyarakat seperti penurunan aktivitas fisik dan perubahan pola makan yang dapat menyebabkan obesitas. Prevalensi *overweight* dan obesitas terjadi peningkatan dari tahun ke tahun. Tujuan penelitian untuk diperoleh determinan obesitas pada guru sekolah selama masa pandemi COVID-19 di wilayah kelurahan Cempaka Putih Barat Jakarta Pusat. Penelitian ini menggunakan analitik kuantitatif dengan desain *cross sectional*. Populasi penelitiannya itu guru SMP, SMA dan SMK sebanyak 165 sampel. Teknik pengambilan sampel yaitu *purposive sampling* dengan menggunakan kuesioner. Analisis data menggunakan *Chi Square* dan *Regressi Logistic Berganda*. Hasil *univariate* menunjukkan 104 orang (63,03%) guru obesitas. Hasil *Chi Square* menunjukkan terdapat hubungan antara pola makan, pengetahuan, sikap, tindakan, dan genetik. Sedangkan yang tidak berhubungan itu aktivitas fisik, tingkat kecemasan, jenis kelamin dan usia. Hasil uji *regresi logistic berganda* di dapatkan bahwa ada lima variabel yang berkorelasi signifikan dengan obesitas pada guru yaitu tindakan, genetik, pola makan, pengetahuan dan sikap. Disarankan untuk guru sekolah mengubah pola hidup sehat selama masa pandemi COVID-19 untuk mencegah terjadinya resiko obesitas.

Kata Kunci : aktivitas fisik, COVID-19, determinan, obesitas, pola makan

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Introduction

The COVID-19 pandemic (*Coronavirus Disease 2019*) is a virus that is of international concern, because this virus threatens public health in general. WHO has declared the COVID-19 pandemic a public health emergency.¹ On February 12, 2020, WHO officially designated this disease as *Corona Virus Disease 2019* (COVID-19) caused by *Severe Acute Respiratory Syndrome Coronavirus 2* (SARS COV2). COVID-19 is an infectious disease that can be transmitted through droplets or splashes of saliva from the sufferer.²

The implementation of restrictions on outdoor activities is implemented in various countries including Indonesia. Indonesia established large-scale social restrictions (PSBB) in 2020 in response to the spread of the COVID-19 disease, these restrictions were implemented by local governments with the approval of the Ministry of Health. Now it's no longer called PSBB and has turned into a policy for the Enforcement of Emergency Community Activity Restrictions (PPKM) which will be implemented from 3-20 July 2021. The implementation of this policy is carried out for the Java and Bali regions in accordance with the criteria for the level of the pandemic situation based on an assessment. Emergency PPKM will conduct restrictions on community activities that are more stringent than what has been in effect so far. DKI Jakarta is the province that implements this policy.²

In the course of the Emergency PPKM policy, which was implemented during the COVID-19 pandemic, The caused changes in people's lifestyles in the form of decreased participation in physical activity and changes in diet that could lead to weight gain. During quarantine at home there was a decrease in physical activity accompanied by an increase in sedentary behavior and unhealthy eating patterns.³ If these factors take place on an ongoing basis, it is possible for the risk of obesity to occur. The risk of obesity can cause various non-communicable diseases, such as stroke, heart disease, and type 2 diabetes mellitus, which can increase the risk of more serious complications in COVID-19.⁴

The problem of being overweight and obesity is also a major health problem in Indonesia. According to Riskesdas data in 2018, there was an increase from year to year the prevalence of overweight and obesity. In 2018, the prevalence of overweight at the age of 18 years increased to 13.6% compared to 11.5% in 2013. For obesity cases, in 2018, the prevalence of obesity was 21.8%, an increase from 2013, which was 14.8%. DKI Jakarta is one of the provinces with a high prevalence of obesity, which is 30%.⁵

An unhealthy lifestyle that can lead to overweight conditions. Changes in lifestyle that are not good, such as the frequency of eating and choosing the type of food during quarantine during the Covid- 19 pandemic can lead to excess weight or weight gain. Research conducted in the

United States on 173 individuals aged over 18 years during self-quarantine showed that 22% experienced an increase in body weight of 5-10 kg and 4% experienced an increase in body weight of more than 10 kg, this is due to increased appetite due to stress, bored, and snacking after dinner while in quarantine.⁶ Research conducted in Italy, Spain, Chile, Colombia, and Brazil stated that there were changes in diet, namely a significant increase in the intake of fried foods and sweet foods during self-quarantine during the COVID-19 pandemic, which led to weight gain.⁷

Decreased physical activity that is not balanced with energy intake in and out will cause weight gain and have an impact on excessive weight gain or obesity.⁸ Efforts to deal with COVID-19 are not only dealing with physical health, but also mental and social health. Mental health disorders begin with feelings of anxiety (*anxiety*). The higher the feeling of anxiety and stress, the higher the level of a person's body mass index.⁹

The results of the initial survey of research conducted in September 2021 using a *google form* that was carried out on school teachers at the SMPN 137 Jakarta with 30 respondents showed that during the COVID-19 pandemic there was a change in body weight during WFH, namely there was an increase in body weight as many as 18 people (60%) and a weight loss of 8 people (26.7%) and there were 6 people whose weight did not change or weight remained. For respondents who are obese as many as 11 people and overweight (*overweight*) as many as 7 people, while those who have a normal BMI are 10 people and are thin (*underweight*) as many as 2 people. The purpose of the study was to obtain the determinants of obesity in school teachers during the COVID-19 pandemic in the Cempaka Putih sub-district, Central Jakarta.

Method

The research method uses quantitative. The research design used was *cross-sectional*. The study was conducted in March 2022 with a population of all junior high and high school / vocational teachers in the Cempaka Putih sub-district, Central Jakarta, which consisted of five schools, namely SMPN 137 Jakarta, SMPKsatrya, SMAS College Ksatrya, SMKSKsatrya, and SMKSCempaka. Sampling was carried out using *purposive sampling technique* with the criteria that teachers are aged 23-60 years and are willing to fill out a questionnaire by filling out *informed consent*. The number of samples taken in this study were 165 people using the two-proportion difference hypothesis test formula from Lameshow (WHO).

The type of data collected consisted of the characteristics of the respondents, namely gender, age, last education, genetic factors, weight and height. Physical activity data used the *International Physical Activity Questionnaire* (IPAQ) which was viewed for 7 days, and the anxiety level data used the *Zung Self-rating Anxiety Scale* (ZSAS) questionnaire. For data on knowledge, attitudes, actions in choosing food, eating patterns using a questionnaire that has been tested for validity by 30 teachers in different research areas, namely SMK Al Makmun Education Center (AMEC)

Bojongsari District, Depok City. All data were obtained online using *google form* with a questionnaire method distributed via *WhatsApp* school groups.

Data processing is carried out using a statistics app. The data obtained will be processed using statistical tests, namely univariate analysis, bivariate analysis using *chi-square* to determine the relationship between independent and dependent variables, while multivariate analysis using *Logistics Regression* to determine the variable's independent which have the most dominant influence on the dependent variable. This research has received ethical approval from the Committee for Medical and Health Research Ethics, University of Muhammadiyah Prof.DR.HAMKA (KEPKK-UHAMKA) number 03/22.01/01453.

Results

Table 1 shows the frequency distribution of the characteristics of respondents in the study. Based on the age group of teachers from 165 respondents aged 23-45 years as many as 115 people (69,7%) and age 46-60 years as many as 50 people (30,3%). Teachers who are female are more dominant as many as 114 people (69,1%), while the male sex is 51 people (30,9%). At the same time the latest education for teachers is more dominant in S-1 (Bachelor) education as many as 148 people (89,7%), S-2 education (Masters) as many as 12 people (7,3%) and D-III education as many as five people (3,0%). Frequency distribution based on BMI there are 76 people (46,1%) of teachers are obese type I and as many as 28 people (17,0%) teachers are obese type II. There were 32 teachers (19,4%) with normal nutritional status while underweight (4,8%).

Tabel 1. Frequency Distribution of Respondents

Characteristics	N	%
Age (years old)		
23-45 years	115	69,7
46-60 years	50	30,3
Gender		
Male	51	30,9
Female	114	69,1
Last Education		
D-III (Diploma)	5	3,0
S-1 (Bachelor)	148	89,7
S-2 (Master)	12	7,3
Body Mass Index (BMI)		
Underweight	8	4,8
Normal	32	19,4
Overweight	21	12,7
Obesity I	76	46,1
Obesity II	28	17,0

Table 2 shows the bivariate analysis there are 5 variables that are significantly related to the incidence of obesity in school teachers during the COVID-19 pandemic, namely genetic variables (p -value =0,028), diet (p -value= 0,004), knowledge (p -value =0,003), attitudes (p -value=0,003), actions (p -value=0,000) with p -value <0.05. Teachers who lack knowledge have 1,458 times the

risk of being obese compared to teachers who have sufficient knowledge. Meanwhile, teachers who have a negative attitude are 1,458 times more likely to be obese than teachers who have a positive attitude. For teachers who take negative actions, the risk of being obese is 2,440 times compared to teachers who take positive actions. Teachers whose diet is not good are 2,720 times more likely to be obese than teachers whose diet is good. Teachers who have genetics (heredity) who are overweight (overweight/obese) have a 1,324 times risk of being obese compared to teachers who do not have offspring who are obese (overweight/obese).

Tabel 2. Bivariate Analysis of Obesity Determinants in School Teachers During the COVID-19 Pandemic in the Region of Cempaka Putih West, Central Jakarta in 2022

Variable	Obesity Incidence				Total		PR*95% CI	P-value
	Obesity		Non Obesity		n	%		
	n	%	n	%				
Gender								
Male	36	70,6	15	29,4	51	100	1,183 (0,938-1,494)	0,242
Female	68	59,6	46	40,4	114	100		
Age								
23-45 years	69	60,0	46	40,0	115	100	0,857 (0,678-1,084)	0,295
46-60 years	35	70,0	15	30,0	50	100		
Genetic								
Yes	52	73,2	19	26,8	71	100	1,324 (1,052-1,666)	0,028
No	52	55,3	42	44,7	94	100		
Knowledge								
Negative	65	73,9	23	26,1	88	100	1,458 (1,132-1,878)	0,003
Positive	39	50,6	38	49,4	77	100		
Attitude								
Negative	65	73,9	23	26,1	88	100	1,458 (1,132-1,878)	0,003
Positive	39	50,6	38	49,4	77	100		
Action								
Negative	78	85,7	13	14,3	91	100	2,440 (1,77-3,362)	0,000
Positive	26	35,1	48	64,9	74	100		
Anxiety								
Anxiety	49	62,0	30,0	38,0	79,0	100	0,970 (0,767-1,226)	0,924
No Anxiety	55	64,0	31,0	36,0	86,0	100		
Physical Activity								
Moderate	75	64,7	41	35,3	116	100	1,092 (0,835-1,429)	0,625
Vigorous	29	59,2	20	40,8	49	100		
Dietary Habit								
Pattern Poor Diet	68	73,1	25	26,9	93	100	2,720 (1,419-5,215)	0,004
Good Diet	36	50,0	36	50,0	72	100		

*PR = Prevalence Ratio

Tabel 3. Multivariate Analysis of Early Models of Obesity Determinants in School Teachers During the COVID-19 Pandemic in the Region of Cempaka Putih West Central Jakarta in 2022

Variable	<i>P-value</i>	PR
Age	0,804	0,882
Gender	0,197	1,908
Genetic	0,000	5,827
Knowledge	0,080	2,168
Attitudes	0,020	2,812
Actions	0,000	15,692
Physical Activity	0,045	1,001
Dietary Habit	0,009	3,224

*PR = Prevalence Ratio

Table 3 is an initial multivariate model which shows there are 3 variables with *p-value* > 0,05, namely age, gender, and knowledge variables that will be issued one by one starting from *p-value* and PR changes. If post the expenditure of the variable results in a change in the PR of another variable $\geq 10\%$, the variable that was released will be re-entered. Meanwhile, if post the expenditure of the variable produces a change in PR <10%, the variable will be removed permanently.

Table 4. Multivariate Analysis of the Final Model of Obesity Determinants in School Teachers During the COVID-19 Pandemic in the Region of Cempaka Putih West Central Jakarta in 2022

Variable	<i>P-value</i>	PR
Genetic	0,001	4,848
Attitudes	0,012	2,971
Actions	0,000	16,559
Physical Activity	0,015	1,001
Dietary Habit	0,007	3,295

*PR = Prevalence Ratio

Table 4 shows that there are 5 variables that have a significant (dominant) relationship with the determinants of obesity in school teachers during the COVID-19 pandemic, namely genetics, attitudes, actions, physical activity, and eating patterns. The action variable is the dominant variable in determining obesity in school teachers during the COVID-19 pandemic, with a PR of 16,559, meaning that school teachers who take negative actions are 16,559 times more likely to be obese compared to school teachers who take positive actions.

Discussion

History of obesity has an important role in a person's metabolism, namely, genetic inheritance in the family is considered to determine susceptibility to obesity in children. Genetic factors directly or indirectly regulate a person's weight. This is thought to affect metabolism and hormonal factors in the body that regulate aspects of energy intake, energy use, and energy expenditure, resulting in obesity.¹⁸

The results of this study are in line with research which says that a history of obesity in parents increases the risk of obesity by 2,016 times in adolescents and there is a significant relationship between a history of obesity in parents and the incidence of obesity in adolescents.¹⁶ The results of this study are similar to studies where the majority of respondents have a family history of obesity as much as 58%.¹⁷

Physical activity is any activity or movement of the body by muscles that requires energy expenditure with the aim of maintaining physical, psikis and achieving a normal weight.¹⁹ Doing physical activity during the COVID-19 pandemic is a good thing to increase endurance, for that, we continue to do physical activity with light to moderate intensity during the pandemic.²⁰

The results toshowed that there was no relationship between physical activity and the incidence of obesity with a *p-value* of 0,625 (*value* > 0,05). The results of this study are similar to research conducted on students of the Public Health Study Program at Bangun Nusantara Sukoharjo University that there is no significant relationship between physical activity and central obesity (*p-value*=0,511) this is because some students do heavy physical activity so they are not at risk of experiencing central obesity.¹¹The results of this study are also in line with research conducted on students of the Faculty of Public Health Unsrat during the COVID-19 pandemic, most of whom had moderate levels of physical activity, namely 54 people (47,8%) and at least 26 respondents with heavy physical activity levels. (23,0%), the level of light physical activity was 33 people (29,2%).²¹

The results of this study are in line with other studies which stated that the description of physical activity carried out by students during the COVID-19 pandemic had a moderate level of physical activity many 56 people (46,7%) and heavy physical activity as many as 12 people (100%).²² The results of this study are also the same as those of other people who state that physical activity is not associated with overnutrition (*overweight/obesity*), this is due to many influencing factors, namely genetic, hormonal, food intake, and others.²³

The difference in the results of this study is different from research conducted showing that the high proportion of obesity in female teachers in Banda Aceh City is caused by deficient of physical activity during the COVID-19 pandemic, this is due to the age factor that is less likely to do physical activity and during the pandemic to do WFH. (*Work Form Home*).¹³

The difference in the results of the research conducted by this researcher is thought to be because at the time the research was conducted, some middle school, high school, and vocational school teachers had started to actively conduct PTM (Face-to-Face Meetings) in schools, although there were still those who underwent PJJ (Distance Learning). Based on the univariate results of the physical activity variable on school teachers with the accumulated calculation of the METs value, none of them are included in the group with less physical activity. This is possible because school teachers have started teaching activities at school, so they do a lot of physical activity and the majority of teachers do sports on weekends. (Saturday and Sunday). During the COVID-19 pandemic, routine physical activities such as walking, cleaning the house, and exercising that are done regularly, timed, and properly done can prevent obesity.²⁴

Poor eating habits are an important cause of overweight and obesity in school teachers. Being overweight or undernourished occurs as a result of the accumulation of excessive amounts of body fat. The underlying cause of overweight and obesity is an energy imbalance between calories consumed and calories expended.²⁵ Based on the results, it showed that there was a relationship between eating patterns and the incidence of obesity and the *P-value* of 0,004 (*P-value* <0,05). From the results of multivariate linear regression, eating patterns had a relationship with obesity (*p-value*= 0,007).

This study is also in line with research conducted on students at Tribhuwana University Malang in 2017, which stated that there was a relationship between diet and the incidence of obesity in students (*p-value* =0,002).²⁶ The results of data collection showed that most in the students had a high diet (77,49%). A similar study was also conducted, which said there was a relationship between diet and obesity in aerobic exercise participants at the Annisa Gymnastics Club, Ledong Barat Village.²⁷ A similar study said that there was a related between diet and the incidence of obesity among students of SMPN 20 Bengkulu City during the COVID-19 pandemic with a *p-value*=0,011. The diet pattern of students of SMPN 20 Bengkulu City was 11 (23,9%) students who were obese with a frequent eating pattern, while 35 (76,1%).²⁸

The choice of food intake is indeed prioritized for endurance during the current COVID-19 pandemic, by setting a nutritionally balanced diet in accordance with the amount needed by the body so that it can improve the body's immune system. Diet plays an important role in determining a person's nutritional status. Eating patterns based on the type of food material studied were staple food patterns, animal side dishes, vegetable side dishes, vegetables, fruit, *junk food*, sweet foods, sweet drinks, fried/fried foods, ciki-cikian snacks/snacks, and emponempon. The frequency distribution of the respondent's diet, it is the type of food consumed in daily life during the COVID-19 pandemic which can cause obesity if consumed in the long term.

The respondent's diet is seen from the frequency and type of food consumed during the pandemic. The results of this study show that most school teachers who are obese consume foods

that are high in energy, high in fat, and sugar a frequent frequency (>3x/week), such as consuming junk food, snacks/snacks, fried foods, sweet foods such as cakes, chocolate, ice cream, and others. Meanwhile, respondents for vegetables and fruit are still less/rarely consumed during the COVID-19 pandemic.

The results showed that there was a relationship between attitudes and the incidence of obesity with p -value <0,05. From the results of multivariate linear regression, attitudes had a related with obesity (p -value= 0,012). The results of this study are in line with other studies which state that there is a relationship between attitudes about obesity and the incidence of obesity with a p -value of 0,000.¹⁷ A similar study was conducted which stated that there was an influence between attitudes towards eating behavior in obese adolescents (p value=0,038). A negative attitude causes respondents to eat foods that can be at risk of obesity.³³

This respondent's attitude is influenced by the respondent's poor knowledge, where someone who already knows about certain information then have will be able to determine and make decisions on how he should deal with it. In other words, when a person has information about obesity and a healthy lifestyle during the COVID-19, he will be able to determine how he should behave during the COVID-19.³⁴

The results of the action analysis with the incidence of obesity in this study had a significant relationship with a p -value of 0.003. From the results of multivariate linear regression, action had a relationship with of obesity (p -value= 0,000). The results of this study are in line with research that there is a relationship between actions about instant food and drinks with the nutritional status of students at SMP Dharma Pancasila Medan (p -value=0,001). Most of the students of SMP Dharma Pancasila Medan have bad behavior as many as 48 people with 33,3% fat nutritional status and 10,4% obesity, while those who have good actions with normal nutritional status are 23 people.³⁵

Other studies say there is a relationship between the action and the level of overweight in obese and overweight (p -value=0,041). This is because 54,92% of high school students who are obese and overweight never go on a diet and eat high-calorie foods such as junk food.³⁶

Actions on the results of this study include the category of negative actions. It is expected that school teachers take preventive measures to prevent the risk of obesity, which is caused by an unhealthy lifestyle. Teachers in schools are able to prevent the emergence of new unhealthy habits in the school or community environment and do not imitate habits that can increase the risk of obesity which can cause various non-communicable diseases such as stroke, heart disease, and type 2 diabetes mellitus which can increase the risk of more serious complications. on COVID-19.⁴

Conclusions

Based on the research that has been done, it can be concluded that there is a relationship between genetics, diet, knowledge, attitudes, and actions with the incidence of obesity, and there is

no significant relationship between gender, age, physical activity, and anxiety levels with the incidence of obesity in teachers. School during the COVID-19 pandemic. Action variables, genetics, diet, attitude, and physical activity are the determining or dominant variables that cause obesity in school teachers during the COVID-19 pandemic. The action variable itself is the dominant variable because the PR value is the largest among other variables. This research is expected to be used as reference material for further researchers and the develop existing theories. Further researchers are expected to add other variables such as stress level variables, sleep patterns, and factors that influence food intake on the diet that affect obesity during the COVID-19 pandemic with different subjects, places, times, and sampling techniques from the study.

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Conflict of Interest

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