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Factors Influencing Obesity Levels in Productive Age 20-24 Years Old in Africa

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ABSTRACT

Obesity is one of the considerable medical issues happening all around the world. Obesity has a high rate that makes it one of the reasons for difficulties in adults. People with excess weight should maintain a healthy diet to avoid diseases caused by high obesity. This research analyzes obesity rates in the productive age scope of 20-24 years in 3 nations on the African landmass (Gambia, Cameroon, and Ethiopia) utilizing information from the Demographic and Health Surveys (DHS) platform from 2018 to 2020. The strategy used to process the data is logistic regression analysis. In this review, four factors are utilized, including living environment, education level of abundance in metropolitan/provincial regions, and occupation. The statistical analysis used here is logistic regression linked to the IBM SPSS Statistic 25 application to identify the factors associated with the Prevalence of obesity in the three countries sampled in the study. From the study results, the Prevalence of obesity in Cameroon country is 14.7%, in the Gambia is 10.8%, and in Ethiopia is 4.4%. From the statistical test using logistic regression, the odds ratio (OR)› 1 means a relationship between these four risk factors and the occurrence of obesity in the 3 sample countries. This study concludes that residence, level of education, wealth index, and work activities directly affect a person's nutritional status, causing obesity.

Keywords: Basal Metabolims Index, obesity, productive age

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1. BACKGROUND

Obesity is a health problem that is widely discussed among the general public. This is because obesity has become one of the leading health problems that occur, both in developed and developing countries throughout the world. This obesity has accounted for approximately 4.0 million deaths and 120 million years of life globally (Yeshaw et al., 2020). Obesity

is the accumulation of excessive fat that results in being overweight. Obesity occurs when energy use is less than energy intake (Weldearegay et al., 2019). So obese people are usually advised to do much physical activity. This is so that the energy intake that comes out is balanced with the energy intake that comes in. Obesity can lead to several health problems. Individuals with obesity have a high risk of developing non-communicable diseases such as coronary heart disease, hypertension, muscle and joint disorders, type 2 diabetes mellitus, cancer and respiratory problems (Agyemang et al., 2021). Based on the complications that can occur from obesity, obesity has become a health problem that is getting much attention in both developed and developing countries. The occurrence of obesity can be influenced by heredity, so genetics is one of the triggering factors for obesity. Several studies have shown that obese children generally come from families with obese parents.

In 2014 around 39% of the global population was obese, with a Body Mass Index (BMI) › 29.9kg/m². The population occurs in most adults. The Prevalence of obesity in 2014 was 14.9% in women and 10.8% in men. However, in 2020, according to analytical studies, the incidence of obesity in women worldwide ranged from 29.8% to 38.0% (Luhar et al., 2020).

Obesity trends are increasing rapidly in developing countries such as the African continent following the economic developments in these countries; this is due to a decrease in physical activity levels and a shift in energy-dense and high-fat diets (Reyes Matos et al., 2020).

From some of the descriptions above, it can be said that the problem of obesity is fundamental to be solved. Obesity has a high enough incidence rate to become one of the causes of complications in adult individuals. In Africa, obesity has become an epidemic that must be treated early to prevent morbidity and mortality. The difficulties that arise can impact health and can cause death. Therefore, interventions must be applied to individuals, families, communities, and globally. Based on the description and incidence rates above, this article will retrace the factors that influence obesity in individuals of productive age.

2. METHODS

The method used in this research uses secondary data. The secondary data used in this study is obtained through the Demographic and Health Surveys (DHS) platform. The method of retrieving data from the DHS platform is to submit an abstract relevant to the topic of the related data to be analyzed. Then if the data has

been obtained from DHS, the data is sorted according to the variables to be studied, and then the information is grouped to make it easier to analyze the data.

In this study, four variables were used, namely living environment, education level, level of wealth in urban/rural areas, and occupation. Researchers used these four variables because of the availability of data on DHS and relevance to the research to be carried out, as well as the existence of previous studies that connected these variables in the case of obesity. Researchers want to compare which of the four variables is higher and affect obesity cases in Cameroon, Gambia, and Ethiopia. In contrast, the affected variable is the Body Mass Index because it is one indicator of the level of obesity in a person. The research subjects focused on the productive age between 20-24 years. In the existing data on the DHS program from three sample countries with productive age (20-24 years), there are 4900, with details of Gambia as many as 1505, Cameroon as many as 2252, and Ethiopia as many as 1143. This is adjusted for the level of body mass index (BMI) found in the survey results in the three countries.

After the secondary data is obtained from the DHS program, statistical analysis is carried out using the IBM SPSS Statistics version 16.0 application. The statistical analysis used in this study is logistic regression. Logistic regression analysis is used to identify factors associated with obesity prevalence in the three sample countries in this study. Logistic regression is an approach that makes a model from a prediction. The assumptions of this analysis include that it does not require a linear relationship between the dependent variable and the independent variable, the dependent variable must be dichotomous, the independent variable does not have to have the same diversity between groups of variables, the sample required is relatively large with a minimum of 50 data samples to determine the independent variable. Logistic regression can also detect relationships because of the non-linear approach to predicting the odds ratio, and in logistic regression, the odds ratio is expressed as a probability. Using the IBM SPSS Statistic 25 application, logistic regression analysis is relatively easy by entering all data and variables into SPSS, sorting out which variables are dependent and independent, then entering the analysis menu, selecting regression, and binary logistics. You can directly enter the variables that we will relate to, namely data on the environment where you live, education level, wealth level in urban/rural areas, and occupation. Thus, secondary

data can be processed and can find the analysis results using logistic regression.

3. RESULTS

Data with a total sample of 4900 men and women aged (20-24 years) from three African countries were analyzed in this study. With the percentage of sex in three countries (Cameroon., Gambia, and Ethiopia), the most dominant is male. Table 1 describes the characteristics of aged 20-24 years with indications of obesity in the Demographic Health Surveys (DHS) in 3 countries. Cameroon has a population of as much as 43.4% in urban areas, while Ethiopia has a relatively low urban population of 24.7%. Based on the number of people living in urban areas has an average of 36.7%. Judging from the highest percentage of the population in Ethiopia who are no education is 79.5%, while the Cameroon area has a no-education population of 48.1%. In the table, it can be seen that Ethiopia has a high wealth index, which is 41.9%. This happens because the number of samples in Ethiopia is very small compared to Cameroon, which has twice the sample size of Ethiopia. It can be seen in the table that the number of Cameroon residents working as much as 60.5% can be attributed to the relatively high level of education in Cameroon State. Meanwhile, the country with the highest non-employment population, namely the Gambia, is 58.3%, and for the country of Ethiopia, no related data are available.

Table 1.

Table 1. Characteristics of Age 20-24 Years with Indications of Obesity in Demographic Health Surveys (DHS) in 3 Countries

Country	N	Male (%)	Female (%)	Urban (%)	No Education (%)	Richest (%)	No Working (%)	Yes Working (%)
Cameroon	2252	50.8	49.2	43.4	48.1	38.5	39.5	60.5
Gambia	1505	54.4	45.6	40.1	67.8	30.8	58.3	41.7
Ethiopia	1143	52.3	47.7	24.7	79.5	41.9	NA	NA

*N Number of age groups (20-24 years) men and women who have information about BMI
*NA data not available

Table 2. Obesity Prevalence with 95% Confidence Interval (CI) Between Ages (20-24) Years in 3 African Countries

Country	Prevalence of Obesity (95% CI)
Cameroon	14.7 (0.25-0.31)
Gambia	10.8 (0.18-0.24)
Ethiopia	4.4 (0.03-0.06)

As seen in table 2, Cameroon and Gambia countries have an obesity prevalence of more than 10%, with CI (of 0.25-0.31) and (0.18-0.24). Meanwhile, Ethiopia has a reasonably low obesity prevalence of less than 5%, namely 4.4%, with a CI (of 0.03-0.06).

Table 3. Odds Ratio and Confidence Intervals (CIs) for Obesity Between Ages 20-24 Years due to Residence, Education, Wealth Index, and Occupational Activity in 3 African Countries

Country	OR (95% CI)			
	Residence, urban vs. rural	Education, low vs. high	Wealth Index, Poor vs. Rich	Currently working, yes vs. no
Cameroon	1.175 (0.811-1.180)	1.175 (0.811-1.180)	1.969 (1.448-2.676)	1.030 (0.557-1.957)
Gambia	1.095 (0.885-1.354)	1.095 (0.885-1.354)	1.220 (0.831-1.790)	1.051 (0.734-1.507)
Ethiopia	1.169 (0.429-3.191)	1.169 (0.429-3.191)	1.163 (0.537-2.520)	*NA

NA data not available

Table 3 describes the odds ratio and 95% Confidence Interval (CI) for indications of obesity among the ages of 20-24 years in three countries with the variables of the area of residence, education level, wealth level, and work activity predicting obesity rates in the three countries. Significantly, the most significant variation in obesity rate between urban and rural living area variables (OR 1.175, 95% CI, 0.811-1.180), low education with high (OR 1.840, 95% CI, 1.382-2.450), and poverty level with wealth (OR 1,969, 95% CI, 1,448-2,676) in Cameroon, and the most extensive variety of work activity variables between those who are working and those who are not working (OR 1,051, 95% CI, 0.734-1.507) in Gambia. Meanwhile, the slightest variation in obesity between urban and rural areas is (OR 1.095, 95% CI, 0.885-1354) in The Gambia. The least taken in the variable is low education with high (OR 1.173, 95% CI, 0.410-3.356) and poverty level with wealth (OR 1.163, 95% CI, 0.537-2.520) in Ethiopia. Thus, it can be concluded that the most extensive predictions for the area of residence, wealth index, and education level related to the incidence of obesity are in Cameroon country and the most significant prediction of the condition of the population being employed or not associated with the incidence of obesity is in the Gambia country.

4. DISCUSION

Relationship between Residence and Obesity Incidence

Obesity can impact increasing the risk of non-communicable diseases and decrease productivity. Obesity is thought to be influenced by various factors. Urban areas have several differences from rural areas in various aspects, such as economic activities and lifestyle, which allow a greater risk of obesity compared to rural areas. Determinants of obesity in urban areas include internal factors and external factors. Internal factors are grouped as consumer behavior and activities, attitudes, and individual characteristics. External factors consist of family support and the environment around the individual (Safitri, D. E., & Rahayu, N. S. (2020).

Based on the results of the study above shows that the incidence of obesity, which has the most prominent variable, is the factor of residence, with a percentage in Ethiopia amounting to 24.7%. Gambia, with some 40.1%, and the largest in Cameroon, with a prevalence of 43.4%. This study also found that significantly the greatest variation of obesity between urban and rural areas (OR 1.175, 95% CI, 0.811-1.180) in Cameroon, then the middle variation is in Ethiopia with a value (OR 1.169, 95% CI 0.429-3.191) while the slightest variation in obesity between urban and rural areas (OR 1.095, 95% CI 0.885-1354) is in the Gambia. The results of this study prove that there is a relationship between the incidence of obesity and the living environment owned by the 3 countries because the results of the OR (odds ratio) value are >1. The results of these studies prove that the factor of residence can also directly affect a person's nutritional status.

Relationship between Educational Status with Obesity Incidence

Education is essential to add insight and knowledge to a person. At the same time, enough knowledge can mediate changing a habit. Education will make it easier for the community or someone to absorb information and apply it to an individual's lifestyle and daily behavior. With someone knowledgeable, he can make food choices tailored to his body's needs (Safitri & Rahayu, 2020). Based on the above, the results of this study indicate that the incidence of obesity, which has the most extensive variation after the residence variable is that respondents with higher education status are smaller than people with low education/uneducated, with a percentage in Ethiopia amounting to 79.5% and in Cameroon by 48.1%. The results of this study also show an OR value of 1,840 (95% CI, 1.382-2.450) for low and high

educational status in Cameroon, which means that they have a 1.8 times higher chance of being obese in the Gambia area. They have an OR value of 1,458 (95). % CI, 1.005-2.114) with low education with a high meaning that it has a 1.5 times higher chance of being obese, and in Ethiopia with low education with a high level of OR 1.173 (95% CI, 0.410-3.356) which means having 1.2 times higher chance of being obese.

The results of the above study indicate a relationship between the incidence of obesity and the educational status of the residents in these 3 countries because the value of OR (Odds Ratio) > 1. obesity. Educational status contributes to an individual's level of knowledge and insight regarding health and nutrition in shaping their healthy lifestyle. The results of the study above are also supported by Puspitasari's research (2018) which shows that respondents with primary education prevalence (78.8%) are obese, and (21.2%) are not obese. Meanwhile, of the respondents with advanced education, there was obesity with a prevalence of 56%, and 4% were not obese. The results of the chi-square test showed that there is a relationship between the level of education and the incidence of obesity in adulthood (p = 0.024), and respondents with a basic education level had a 1.4 times greater risk of obesity compared to respondents with advanced education levels (Puspitasari, 2018).

Relationship between Wealth Index and Obesity Incidence

The wealth index discusses how the household's cumulative standard of living. The wealth index is calculated using easily collected data on household ownership of certain assets, such as televisions and bicycles, materials used for housing construction, and types of access to water and sanitation facilities. Income affects the choice of food and the variety of food that a family will consume. The greater the family income, the more variety of food that can be consumed and the possibility of obesity are also higher (Rosidiana, 2012). Someone with low income can also be obese, and they have limited purchasing power compared to people with high income. The selection of the type of food and the amount of food consumed is no longer based on health needs and considerations but the consideration of the taste of delicious and filling food so that it will affect the occurrence of obesity. From the data that has been analyzed with a value if the Odds Ratio (OR) > 1 is a risk factor for obesity, we find that the wealth index in all three has an OR > 1, which means that there is a relationship between the level of wealth and the Prevalence of obesity in the 3

countries, but there is no significant relationship there.

Relationship between Work Activities with Obesity Incidence

The general nature of work in rural and urban African areas also contributes to the differences in obesity and overweight between the two settings. In most rural settings, the primary forms of employment are still non-mechanical agriculture and physical activity-based work such as fishing, small-scale mining and logging. However, there is an increasing shift in urban areas from highly physical activity-based jobs such as construction and factory work to sedentary and service-based jobs. The risk of being overweight in workers can be caused by changes in activity patterns, eating patterns, and the type of work they do. In addition, the difference in body weight between workers who work in the office and in the field is caused by differences in workers' physical activity. Weight gain is usually caused by a sedentary lifestyle and decreased physical activity, especially at a bustling working age. Nutritional status can be closely related to the weight of workers. From the data that has been analyzed with a value of the Odds Ratio (OR) › 1 is a risk factor for obesity, we found that work activity is associated with the Prevalence of obesity in Cameroon and Gambia, while in Ethiopia, it cannot be analyzed due to unavailability of data.

5. CONCLUSION

Obesity is the excessive accumulation of fat which results in being overweight. Several factors, such as place of residence, educational status, wealth index and work activity influence the occurrence of obesity. The results of this study prove that the factors of residence and education can directly affect a person's nutritional status. Educational status contributes to an individual's level of knowledge and insight regarding health and nutrition in shaping their healthy lifestyle. This study also proves a relationship between wealth level and obesity prevalence in the 3 countries. On the relationship between work activity and obesity, it is found that work activity is related to the Prevalence of obesity in Cameroon and Gambia while in Ethiopia, it could not be analyzed due to the unavailability of data.

AUTHOR CONTRIBUTIONS

Substantial contributions to conception, data collection, and analysis: Akhmad Zainur Ridla, Elisa Putri Nofiyanti, Oktaviana Dwi Kartikasari, Setyowati Nurrohmah, Reza Lailiyatul Putri, Ra'uuf Thrisna Adjie, Ririn

Nurhidayah, Indah Octavia Br Pasaribu. Writing: Akhmad Zainur Ridla, Elisa Putri Nofiyanti, Oktaviana Dwi Kartikasari. Manuscript revisions: Akhmad Zainur Ridla.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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