Obesity rates and its various impact to adults over the age of 18 in the United States

Yanbo Han

The high school affiliated to Renmin University, Beijing, China

hyb666np@ldy.edu.rs

Abstract. Obesity has become a global public health problem, which will negatively affect individual health along with the social economy, but there are fewer effective ways to control obesity and useful methods to prevent obesity from occurring. A data set about obesity rate was used as the basic data set, and the average obesity rate and BMI for each group were calculated using formulas of descriptive statistics. Then the results were shown through figures using the method of correlation analysis. Also, in addition, for a more comprehensive understanding of the differences between different regions, the study of Ward et al was also referred. Through analysis, obesity rates of adults in different age group in the U.S has a tendency of rising in recent years. There are also differences in obesity rates by various circumstances. In addition, there is a correlation between genetic factors, family environment, social impact, and obesity rates. And a high obesity rate will have bad effects on both adults in the society and the society itself. Obesity causes various impacts on adults over the age of 18 in America. And more usable and effective ways of dealing with obesity should be created.

Keywords: Obesity rates, Adult health, hazards, future solution.

1. Introduction

Obesity is one of the extremely harsh health concerns facing contemporary society, especially in the United States. Obesity has a negative result on individual health, including cardiovascular disease, diabetes, joint problems, and more. Therefore, research and understanding the prevalence of obesity among adults in the United States is critical to developing effective public health policies and personal health management. It is undeniable that researchers have made some efforts to find ways to deal with obesity and also made some progress. For example, in the research of Bessesen, D. H, a couple of ways to reduce obesity were discovered and analyzed: Diet therapy, exercise, drug therapy, and surgical therapy [1]. These methods were proved to be useful to help people control obesity under the improvement of scientific experiments and data analysis. Also, in the Potential Effects of a Penny-Per-Ounce Tax on Sugar-Sweetened Beverages on Obesity in the United States research, introducing a tax on sugary drinks would lead to a 15% reduction in the consumption of such beverages among adults aged between 25 and 64. It is estimated that, over the course of the 2010-2020 period, this tax would prevent 2.4 million cases of diabetes, 95,000 cases of coronary heart disease, 8,000 cases of stroke, and 26,000 premature deaths, while also avoiding over $17 billion in medical costs. In addition to reducing the adverse health and cost burdens of obesity, diabetes, and cardiovascular diseases, a modest tax on sugar-sweetened beverages could generate almost $13 billion dollars annually for tax revenue system

[2]. However, a gap started to occur: Through the research of Flegal, K. M., Carroll, M. D., Ogden, C. L., & Johnson, C. L. , the obesity among US adults in the area of prevalence and trends and a lot more other research, the average rate of obesity among American adults and even adults in the whole world tend to be rising [3-10]. This means that all the methods mentioned above did not seem to have a real effective impact on controlling obesity. Under these circumstances, the data set of the percentage of adults aged in different age group which means 18 yaers old and older who have obesity of different age groups in different states of America from 2019-2021 were analyzed this time and the various impacts on adults were also analyzed, aiming to provide ideas for filling the gap of none useful methods to deal with obesity, and to explore the changing trend and influencing factors of adult obesity rate in the United States, and tries to provide important information and reference for solving the problem of obesity.

2. Methodology

A variety of methods to analyze obesity among U.S. adults to ensure the accuracy and reliability of the results were used. The data set used this time was based on the Nutrition, Physical Activity, and Obesity - Behavioral Risk Factor Surveillance System chart from the Centers for Disease Control and Prevention [11]. There were 4 blocks in the data set: Year, Name of the states, Age group, and Obesity rate. In the data set, adults from different states in different years were separated into 6 groups: 18-24, 25-34, 35-44, 45-54, 55-64, and 65 or older. Then the average obesity rate of adults from different age groups of different states in these three years was measured. The obesity rate was measured under the formula: obesity rate =adults who were obese in the group/the total number of people in the group. Normally, the person who was told to have obesity was defined under the BMI number. The formula of BMI was weight+height^2. If a person's BMI was bigger than 30, then he or she was defined as obese. Then the scatter plots diagram for each age group using R language based on the Nutrition, Physical Activity, and Obesity - Behavioral Risk Factor Surveillance System from the Centers for Disease Control and Prevention were also made [11]. During the data analysis process, the descriptive statistical method was employed to investigate how to obtain data that accurately reflects objective phenomena. The collected data was processed and presented in the form of graphs, enabling comprehensive generalization and analysis to reveal regular quantitative characteristics of the target phenomena, were used to calculate the obesity rate of American adults in different age groups of different states and the method of correlation analysis, which was the process involved describing the degree of closeness between objective entities and expressing it using relevant statistical indicators, were used to draw the scatter plots of the data set and find the rules and trends containing in it. The sample size of the data was 88473 groups containing an average of 1632353 people in each group. All of the analyses were conducted using R studio 2023.06.1+524. In addition, for a more comprehensive understanding of the differences between different regions, the study of Ward et al was also referred [3]. Their study analyzed the changing trends of obesity in the United States by state and provided the results of quantitative analysis. In addition to referring to existing research methods, other data sources such as health surveys, relevant research reports, and statistics were also used. By combining these data, a comprehensive picture of the obesity problem among American adults was raised.

3. Results

Through the formula of obesity rate, the formula of BMI, and the method of correlation analysis, the obesity rate of adults from different age groups in different states from America in 2019-2021 was calculated and found that there was a big difference in the obesity rate in regions except for adults aged 18-24 which were always around 20%. The obesity rates of other age groups in different states and different years were various but not less than 27.5%. It was also shown that through descriptive statistics, Figure 1 was created which shows the average obesity rate of people from different age groups in America. It was very obvious from Figure 1, that except for adults aged 18-24, there was an average of 30 percent and even more adults from America in different age groups suffering from obesity, and the obesity rate almost has not changed from 2019-2021, which means that there were a big amount of

Americans suffering from obesity and none effective ways of controlling obesity were found or used [11].

In addition, based on the findings and analysis shown in Figure 1, it was easy to conclude that the problem of obesity among adults has continued to increase over the past few decades, especially among women. According to Flegal et al., obesity rates increased significantly over the decade from 1999 to 2018 [3], [6-10]. Research by Ogden et al. suggests that the obesity trend continued to increase from 2015 to 2016 [4].

In addition, there are clear differences in obesity rates between regions, with some regions having higher obesity rates than the national average, especially in the South, according to Ward et al. [5].
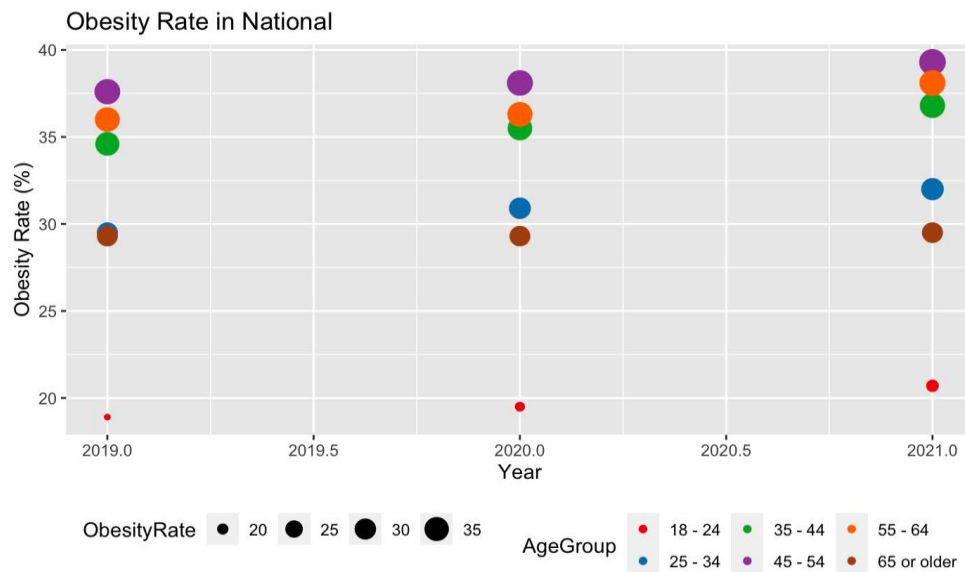

Figure 1. Average obesity rate of people from different age group in America.

4. Discussion

4.1. Main findings

These findings from above suggest that adult obesity in the United States is a serious social health problem. Since obesity has too many impacts on adult life. Research shows that obesity increases the probability of all kinds of diseases and fever [12]. For example, research shows that the probability of stroke among elders [13], the probability of catching high blood pressure [14], the probability of dying from cancer [15-16], the probability of suffering heart attack [17], probability of catching coronary heart disease [18-20] probability of suffering diabetes [21], probability of suffering endocrine dysphasia [22], were all proceeded due to obesity. Research also shows that obesity sharply decreases the life expectancy of adults and makes their age of death earlier [23-24]. Obesity will also cause the living quality of a person to decrease [25], it will have a bad effect on mental and social health [26], it will also cause bad effect on employment [27], and casts a big amount of fee on public medical resources [28].

Thus, in order to prevent all of the above circumstances from happening, trying to dig out the root cause of obesity seems important. Research shows that the causes of obesity are various and have a lot of aspects. Research indicates that multiple different genetic forms within the first intron of the FTO gene have been consistently and significantly linked to obesity in various independent genome-wide association studies [1]. Also, the genetic factor was also an important aspect, research suggests that genetic factors mainly influence obesity by increasing the body's susceptibility to it, and obese individuals often have a clear family history of the condition [29]. Family environment was also another factor since the data shows a heavy atmosphere in the family will cause people to be obese [30]. Social impact was also an aspect [31]. Combining these studies and analyses, it was easy to conclude that taking

measures to promote healthy eating and active lifestyles was needed, while further research is needed into potential causes and solutions to the problem of obesity. Understanding the factors that influence obesity rates can help us develop more effective interventions to reduce obesity rates and improve people's quality of life.

Based on the above data, figure, and paper analysis, it was found that the obesity rate of American adults has been rising recently, especially among women, and there are also differences in obesity rates by age group, race, and geographic region. In addition, there is a correlation between household income level and education and obesity rates. However, recent studies and methods have not come up with any truly useful methods to prevent obesity among adults.

4.2. Consistent and inconsistent comparing to previous paper

From the study above, the research of Flegal, K. M., Carroll, M. D., Ogden, C. L., & Johnson, C. L. , prevalence and trends in obesity among US adults and a lot more other research, the average rate of obesity among American adults and even adults in the whole world tend to be rising [3-10]. The data analysis and figure creation proved that the obesity rate of American adults has been rising recently, especially among women. Also, according to previous studies and data analysis, obesity may cause many kinds of disease in adults and will also have an impact on societies. However, previous studies have come up with a lot of methods to deal with high obesity rates very early, but through the data analysis above, none of them seem to have a real impact on easing the obesity rate among American adults.

4.3. Strengthens and limitations

The findings of the previous data analysis all came from a very recent database, which will make the findings much more persuasive. Also, scatterplots of obesity rates among adults of different age groups in different states of America were created, which will let the results and findings be more specific and convincing. However, although the findings shed light on the increasing prevalence of obesity among the adult population in the United States, there are certain limitations that need to be addressed. Firstly, the data analysis mainly relied on secondary data sources, such as research papers and published statistics. As a result, there may be variations in data collection methods and criteria used across different studies, which could potentially introduce biases and affect the overall accuracy of our findings.

Secondly, the analysis primarily focused on the national trends of obesity, without delving into the specific factors that contribute to such an increase. Obesity is a multifactorial issue, influenced by various genetic, environmental, and behavioral factors. Further research should explore these factors in depth to gain a more comprehensive understanding of the obesity epidemic and to develop targeted interventions.

Moreover, the impact of socioeconomic status on obesity rates was not considered. Research has shown that individuals from lower socioeconomic backgrounds may face greater challenges in accessing healthy foods and engaging in physical activities, which could contribute to higher obesity rates. Therefore, future studies should incorporate socioeconomic factors to provide a more nuanced analysis of the obesity problem.

4.4. Future outlook

Although this analysis has identified the alarming rise in obesity rates among adults in the United States, there is hope for addressing this critical public health issue. Firstly, the awareness surrounding obesity and its associated health risks has increased significantly over the years. This increased awareness can catalyze individuals, communities, and policymakers to prioritize and implement effective strategies for obesity prevention and management.

Additionally, advancements in technology and data collection methods provide promising opportunities for future research. The use of wearable devices and mobile applications can enable real-time monitoring of individuals' dietary habits, physical activity levels, and overall health status. These tools can provide valuable insights to inform personalized interventions and promote behavior change.

Moreover, a multidisciplinary approach is crucial in tackling the obesity epidemic. Collaboration between healthcare professionals, policymakers, educators, and community organizations can facilitate the development and implementation of comprehensive obesity prevention programs. These programs should encompass nutrition education, the promotion of physical activity, and the creation of supportive environments that facilitate healthy lifestyle choices.

In conclusion, while certain limitations were undeniable, it contributes to the growing body of evidence highlighting the increasing prevalence of obesity among adults in the United States. The findings call for further research to explore the underlying factors contributing to obesity and the development of targeted interventions. By addressing these limitations and embracing novel approaches, working towards reducing obesity rates and improving the overall health and well-being of the population will definitely be the next step.

5. Conclusion

Based on the findings and previous studies, it was easy to conclude that obesity causes various impacts on adults in America, and obesity rates are growing among U.S. adults, especially women. And previous research has not come up with any useful methods. However, despite some limitations, valuable information for understanding the problem of obesity among adults in the United States was provided. To address this problem, increasing public awareness, developing targeted interventions, and promoting changes in the social environment were needed. By working together across disciplines, the potential to reduce obesity rates and improve people's health and well-being was held tightly in our hands.

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