

Obesity in Children and Its Connection to Diabetes in Saudi Arabia: Review

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ABSTRACT

The significant rise in the rate and the prevalence of obesity in KSA in the past 20 years has increased high incidences of diabetes, as well as glucose intolerance levels. The research applied a cross-sectional study, and this involved the analysis of about 402 Saudis living in the Northern region of Saudi Arabia (Turaif city). It relied on the analysis of data that was collected in the past two months. The sample size primarily consisted of children and adults aged between the ages of 6 and 65. The researcher used questionnaires to collect information from the respondents. From the study, the mean age was about 23.27 while the men to women ratio was about 38.2 percent to 61.8 percent. The total prevalence rate of diabetes mellitus was reported to be 4.5 percent while the pre-diabetic cases stood at approximately 7.5 percent. The regular cases were reported to be 88.1 percent. Prevention programs and various awareness campaigns about diabetes and the impacts of childhood obesity should be instituted and different

control strategies implemented. There is also the need for multiple health facilities in Saudi Arabia to develop diabetes management and screening programs.

Keywords: Children, Obesity, Diabetes Mellitus, Saudi Arabia.

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INTRODUCTION

In the U.S., the number of overweight and obese children who are between 6 and 12 years increased to approximately 18 percent in 2012 from 8 percent in the year 1980 ⁽¹⁾. Obesity stems from calorie imbalance and is affected by several environmental, behavioral, and genetic factors. Childhood obesity usually has long-term, as well as immediate effects on people's well-being and health. In most cases, obese children typically are prone to diabetes and a host of cardiovascular diseases. For the Saudi children, the prevalence of obesity has been increasing annually, and can primarily be attributed to nutritional risk factors. It should be noted that obese children are likely to develop pre-diabetes, a health condition in which the blood glucose levels customarily indicate a high-risk factor for diabetes development.¹ Moreover, the obese children are at high risks of developing sleep apnea, joint and bone problems, and a variety of psychological and social issues such as low self-esteem and stigmatization. This paper seeks to explore the prevalence and rates of the issue of childhood obesity and overweight in Saudi Arabia and its connection to diabetes.

BACKGROUND/SIGNIFICANCE OF THE STUDY

Over the past few years, Saudi Arabia has adopted the western form of lifestyle, and this has made it have one of the most advanced and highest overweight prevalence levels. According to the World Health Organization (WHO), childhood obesity is regarded as a significant challenge for most countries in the 21st century.² The statistics indicate an alarming and overwhelming situation that requires an urgent public health intervention. Of concern, data and statistics show that obesity is not only experienced in developed countries but is a worldwide crisis that needs to be addressed. Nations in Africa and Western Pacific and other underdeveloped continents have in the recent past experienced high obesity levels among the children. It is important to acknowledge the fact that obesity among children usually varies from one country to another.

PROBLEM STATEMENT

Based on historical data, there has been an increase in obesity rates among the Saudi children, and this has significantly

contributed to the rise of diabetes prevalence in Saudi Arabia. Besides, the rate of childhood obesity has increased in Saudi Arabia, and this has been attributed to the consumption of junk foods, changing lifestyles, and the lack of physical exercises among others. Therefore, there is the need to address the issue of high diabetes levels in Saudi Arabia. Addressing the issue would require an analysis of the relationship that exists between childhood obesity and diabetes. The WHO notes that Saudi Arabia is one of the nations with the highest diabetes rates in the world, and this can be attributed to the high prevalence of obesity among the Saudi children. Apart from diabetes, obesity can also result in a variety of cardiovascular diseases and high blood pressure among others.

PURPOSE OF THE STUDY

The primary research purpose is to analyze and discuss the issue of childhood obesity and how it is related to the issue of diabetes in Saudi Arabia. The study's primary focus is to investigate some of the management interventions and strategy that can help in addressing the challenge of obesity among the Saudis.

RESEARCH QUESTION

The central research question in this particular context is, "How has the issue of childhood obesity resulted in the high diabetes rates in Saudi Arabia?" The second research question is "What are some of the strategies that can help in addressing the prevalence of high obesity rates among the Saudi children?"

RESEARCH OBJECTIVES

This research paper has various achievable targets that will be analyzed and evaluated at the end to determine if the goals have been realized. Some of the objectives of this research study include;

- To examine and analyze the rates and prevalence of obesity among the Saudi children.
- To analyze the relationship between childhood obesity and diabetes in Saudi Arabia.
- To analyze some of the strategies or the interventions that can assist in addressing the challenge of obesity among the Saudi children.

JUSTIFICATION OF THE STUDY

Information obtained from this research study will be pivotal in promoting academic research by offering useful insights into the issue of childhood obesity and diabetes among the Saudis. The results or the findings of the study will be essential in enabling the health stakeholders in Saudi Arabia to formulate strategies and interventions that can assist in addressing the issue of childhood obesity. Additionally, the research study will be necessary for educating the Saudis and various health providers on some of how they can address the issue of childhood obesity.

ORGANIZATION OF THE STUDY

The first part of this research paper provides the introduction and the background information. The second chapter presents the literature review on childhood obesity in Saudi Arabia, the connection of childhood obesity to diabetes in Saudi Arabia, and the strategies that can assist in addressing the issue of obesity among the Saudi children. The third chapter presents some of the

methods that were used to conduct the study. The last section covers the summary, discussion and the conclusion of the research paper.

SIGNIFICANCE OF THE STUDY

The research study will help the health practitioners to understand the relationship that exists between childhood obesity and the issue of diabetes in Saudi Arabia. Additionally, it will assist different health stakeholders to develop mechanisms that can assist in addressing the issue of childhood obesity in the KSA. The research will also be essential in helping the Saudis to change their lifestyle and diet in an attempt to address the high incidences of childhood obesity in the country. In other words, this research paper will have significant impacts on the Saudis and the various health facilities in Saudi Arabia.

LITERATURE REVIEW

Childhood Obesity in Saudi Arabia

According to Al Dhaifallah, Mwanri, and Aljoudi (2015)², the obesity prevalence rates among the Saudi children have significantly increased from 1989 to 2006. Various factors are ordinarily related to the high rates in a nation such as Saudi Arabia. The factors are customarily influenced by a variety of social determinants such as poor dietary patterns, physical inactivity, lifestyle, and gender among others. Unhealthy school canteen meals, sedentary lifestyles, inadequate physical activities, and insufficient education regarding the role of fitness and exercises in girls' schools have been documented as some of the most significant factors in obesity. Such factors play an essential role in enhancing the rates of Saudi's childhood obesity.² Due to obesity, it common to find various health facilities report high rates of cardiovascular conditions and a wide range of lifestyle conditions like diabetes.

The first social determinant of childhood obesity and overweight in Saudi Arabia is the lifestyle. The discovery of oil in this country has significantly changed the Saudi's socioeconomic status. Between the year 1989 and 2006, the prevalence and rates of obesity among the Saudi children increased from about 3.5 percent to approximately 24.5 percent, and the upward trend is projected to continue.² Although the discovery of oil has resulted in a variety of benefits for the Saudi region, the Saudis' lifestyle has in the recent few years become more sedentary. Significantly, a sedentary lifestyle is normally an established indicator of different health outcomes including heart diseases, diabetes, and high blood pressure among others.

Due to the enhancements in the Saudis' socioeconomic status, the majority of the Saudi children usually use cars to transport them to and from the school, watch television, engage in fewer physical exercises, and play video games for a protracted length and amount of time. Several studies have indicated that the obese Saudi adolescents and children usually are less active compared to the non-obese Saudi children. Such studies argue that the environment plays an essential role as there are significant differences between the children living in rural farms and those living in rural deserts. In most scenarios, adequate sleep duration enhances the chances of a child having a normal weight and body mass. Al Dhaifallah, Mwanri, Aljoudi in their 2015 study note that the lack of adequate can lead to overweight in the school-going children.²

Dietary habits have also been noted to be correlated with high overweight rates among the Saudi children. Economic development and growth often create changes in eating habits and the usual patterns of dietary or food consumption in the Gulf region.² For most Saudis, food has become affordable due to the significant increase in their disposable incomes. Unfortunately, these social changes have resulted in changes in the concept of eating. For instance, it has changed from being necessary and simple nourishment to a marker of pleasure, as well as lifestyle. Moreover, there has been a significant shift from the local and the traditional foods and meals to westernized and urban fast foods that are often low in fiber, rich in salt, sugar, and fat. El Mouzan et al.'s study³ reported that in Saudi Arabia, the consumption of carbonated drinks and unhealthy snacks is usually popular among the school-going children and adolescents. A survey conducted in the recent past indicated that the use of sugary meals and beverages increases the children's BMI, and this has been reported to be one of the potential factors that can contribute to obesity among the Saudi children. Sugary drinks tend to be less filling than other types of foods, and can, therefore, be consumed quicker than other meals, a situation which may result in a high intake of calories. It is well known that inappropriate dietary patterns coupled with physical inactivity are significant predictors of diabetes and other chronic health conditions.⁴ Unlike the non-obese Saudi children, the obese and overweight Saudi children usually have a low intake of fiber, fruits, milk, and breakfast. The Saudi children from affluent households often associate the consumption of junk food with convenience, independence, and pleasure.

Obesity-related diseases have been reported with increasing rates and prevalence in obese adolescents and children. Some of these disorders include the type 2 diabetes mellitus, impaired glucose tolerance, and a wide range of cardiovascular health conditions. Other problems that have been identified among the obese Saudi children are the impaired life quality, depression, and low or poor self-esteem. Additionally, the overweight and the obese preschool children have a high probability of becoming obese and overweight children and adolescents in the future. They are also likely to become obese individuals in the future with all the related health risks and hazards.

Connection of Childhood Obesity to Diabetes in Saudi Arabia

According to various research studies, childhood obesity usually persists through adulthood. Data collected in the recent past shows that a majority of obese preschool children in Saudi Arabia were also overweight and obese at adulthood. Childhood obesity has resulted in a significant increase in the diagnosis or the report of the type 2 form of diabetes among the Saudis over the recent decades. In most cases, obesity is deemed to be associated or correlated with insulin resistance which may make an individual develop overt type 2 forms of diabetes mellitus. According to Bhadoria et al., obesity's influence on diabetes is primarily determined by the degree or the level of obesity and the body region where fat accumulates. Significantly, increased upper body fat that may include visceral adiposity is typically associated with a host of cardiovascular conditions, diabetes mellitus, as well as metabolic syndrome. Apart from the differences in the distribution and accumulation of fat in the body, there are various subtypes of adipose tissues that may have different effects on glucose homeostasis. Adult humans have a variable and limited amount of

brown fat cells, which are essential for the process of thermogenesis. Additionally, the brown fat cells have the potential of influencing energy expenditure, and when they are limited, an individual may be susceptible to obesity.⁵ In Saudi Arabia, the type 2 diabetes in most cases is connected to obesity than gestational diabetes, as well as hereditary diabetes. The percentage of overweight and obese individuals in Saudi Arabia has increased to approximately 70 percent, and this can explain the high incidences of cardiovascular diseases, cancer, and diabetes among others. In other words, the high number of obese children and adults in the KSA primarily explains why the kingdom has a high prevalence of diabetes and other cardiovascular diseases.

The World Health Organization has in the recent past predicted that the KSA would experience an increase in diabetes mellitus. It attributes the increase in diabetes mellitus to the enhancements childhood obesity's rates and prevalence, which has caused changes in the incidences of diabetes and glucose intolerance. According to the WHO, the emergence and the prevalence of diabetes as health concern and issue among the Saudis, primarily the teenagers are mainly attributed to the notable lifestyle changes and an increase in obesity rates. In the past decades, the type 1 diabetes was the most common type of diabetes among the children. However, for the past two decades, the type 2 form of diabetes which is primarily popular for its unique etiology has been on the rise.⁶

A study conducted by Al-Rubeaan in 2015 revealed that the prevalence and the incidences of diabetes among the teenagers was approximately 10.83 percent. According to Al-Rubeaan, there tends to be high abnormal glucose metabolism among the Saudi adolescents and children. Based on Al-Rubeaan's study, it is evident that Saudi Arabia has the highest reported rates of diabetes among children and various adolescents. Moreover, the study reported that about 90 percent of these individuals with diabetes were unaware that they had such a condition. Due to this, there is the need for early screening programs for diabetes, especially in the obese Saudi adolescents and children. Moreover, there is the need to develop a host of interventions that can help in solving and tackling the menace of obesity and overweight among the Saudis.

Strategies To Combat Childhood Obesity In Saudi Arabia

The Ottawa Charter plays an essential role in describing health enhancement and promotion as the primary intervention that allows individuals to increase the influence and dominance over various health determinants thereby improving their health. Health promotion seeks the development, planning, evaluation, and the implementation of different health promotion interventions and policies through the use of strategies such as mass media, community engagement, community development, as well as health education.⁷ With the core objective of appealing to the Saudi population, the development and the establishment of different health promotion policies and activities must be conducted based on the Islamic rules.² In other words, consideration of the Saudi's social norms and culture must be incorporated while developing the policies, interventions, and strategies for Saudi community to avoid conflicts that may occur between the Saudi's sociocultural values and the health messages. It has been asserted that in most instances, the sociocultural values tend to have an essential role in the Saudi lifestyle.

Educational institutions should be at the forefront of creating sustainable enhancements in the Saudi Arabian community's health status. The school health programs significantly influence the lives of adolescents and children through the improvement of their skills, attitudes, and health-related knowledge. Almohsen et al. (2017)⁸ study indicate that such skills and approaches are necessary to enable them to learn good health outcomes and a broad spectrum of healthy behaviors. Moreover, children spend a substantial amount of their time and lives at the school environment, and this shows the critical role educational institutions have in shaping the children's eating habits, attitudes, and consumption behaviors. It is plausible to recognize that various educational institutions exert indispensable influence on the children's social and health outcomes. Due to their role and importance, schools in partnerships with different health organizations should develop and implement comprehensive programs that are primarily aimed at overcoming or providing solutions to the high prevalence of obesity among the Saudi children.

There is the need to improve the Saudi parents' awareness and knowledge concerning the prevalence of obesity among their children. It is noteworthy that one of the most effective strategies that can help in improving the children's health status is developing and establishing collaboration between the parents and the schools. Schools act as the main contact points for the families and the children. It for this reason that Al Dhaifallah, Mwanri & Aljoudi (2015) study² assert that schools should be employed by health institutions to promote good health among the communities, families, as well as the children. Schools have a vital role in providing families and communities with information concerning the importance of healthy diets and the essence of physical exercises and fitness among the Saudi children. According to the WHO, the school systems can be essential avenues for improving the parents' awareness and knowledge concerning the issue of childhood obesity.

Another strategy that would prove to be pivotal and effective in enhancing the Saudi children's health outcomes is the promotion of regular physical activities and exercises. The promotion of regular physical practices has been classified as a fundamental public health strategy that can have significant impacts on health enhancement at both the societal and individual levels. Al Dhaifallah, Mwanri and Aljoudi note that physical activities have substantial benefits for the children and adults. Regular exercises and physical activities can reduce the children's risk of contracting chronic diseases including conditions such as cardiovascular diseases and diabetes. Quality physical education programs provide children with the opportunity of gaining the skills, knowledge, and abilities needed to maintain an active lifestyle throughout their early life and into adulthood. The last strategy that can be important in addressing the menace of obesity among the Saudi children is intersectoral collaboration and community participation. Community participation usually provides the local individuals with the chance of working collaboratively with the government, health organizations, and different groups.² In the Saudi context, community leaders and the local administrators have the mandate to make decisions that relate to the locals' needs. Due to the complex, as well as the multifaceted aspects of different childhood obesity predictors, it is suggested that a comprehensive approach can be an effective strategy. The

approach should be at the forefront of incorporating health and preventive promotion practices and addressing childhood obesity's social, environmental, and economic determinants.

Based on the cultural values and traditions in Saudi Arabia, the need to control childhood obesity in most cases requires collaboration between the healthcare agencies, parents, community leaders, food industry, and the schools. In Saudi Arabia, a broad spectrum of health promotional strategies such as healthy eating campaigns and workshops have been employed with the core objective of promoting physical activity and healthy eating behaviors and habits among the children and the community members.

METHODS AND RESEARCH DESIGN

The research applied a cross-sectional study, and this involved the analysis of about 402 Saudis living in the Northern region of Saudi Arabia (Turaif city). It relied on the analysis of data that was collected in the past two months. The sample size primarily consisted of children and adults aged between the ages of 6 and 65. Information from the sample size was collected through the use of questionnaires. The study obtained data about the prevalence of obesity rates based on age and sex. It also measured the participants' weight and height, and this was used to calculate their BMI. With the core objective of analyzing the participants' blood glucose levels, blood samples of various participants were collected and analyzed. The study sample comprised of both men and women who were aged between the age of 6 and 65. The main sampling procedure was systematic random sampling technique. The study's participants or sample were interviewed through the use of well-structured questionnaires that covered the following items:

1. The socio-demographic attributes that included sex and age.
2. The blood sample of the research participants was drawn under full aseptic conditions with the primary intention of determining the random blood glucose amounts or levels. Based on this study, an individual was considered to be diabetic if his or her arbitrary blood glucose level was more than 200 mg/dl.
3. The anthropometric examination primarily comprised of weight, as well as height measurements, and this involved the use of a calibrated balance beam scale. Based on this, a participant with a normal weight was described as having a BMI of less than 25 kg/m². On the other hand, an obese individual had a BMI of more than 30 kg/m² while an overweight individual had a BMI of between 25 and 30 kg per square meters.

Before conducting the study, the researchers were under an obligation to seek permission from the university's research and ethics committee. The questionnaire used in this case had the introduction section that provided the participants with information about the research study's aims and significance. Confidentiality of the data collected from the participants was maintained throughout the study.

RESULTS

From the study, it was reported that the mean age was about 23.27 while the men to women ratio about 38.2 percent to 61.8 percent. The total prevalence rate of diabetes mellitus was reported to be 4.5 percent while the pre-diabetic cases stood at

approximately 7.5 percent. The normal cases were reported to be 88.1 percent. It was also reported that the urban males had higher rates of obesity and diabetes than the females. However, the study realized that in most parts of Saudi Arabia, the females' obesity rates were typically higher than those of the males. From figure 1, it is clear that the obesity and overweight rates among the female gender are higher than those of the male sex. The research further realized that some of the primary determinants of

the high obesity rates among the Saudi children were diet, overweight, the consumption of western fast foods, education, and the lack of physical exercises.

Besides, the research study noted that Saudi Arabia had reported the high rates of childhood obesity and diabetes for the past two decades. Some of the impacts of obesity in Saudi Arabia include ischemic heart diseases, diabetes, cardiovascular diseases, and diabetes.

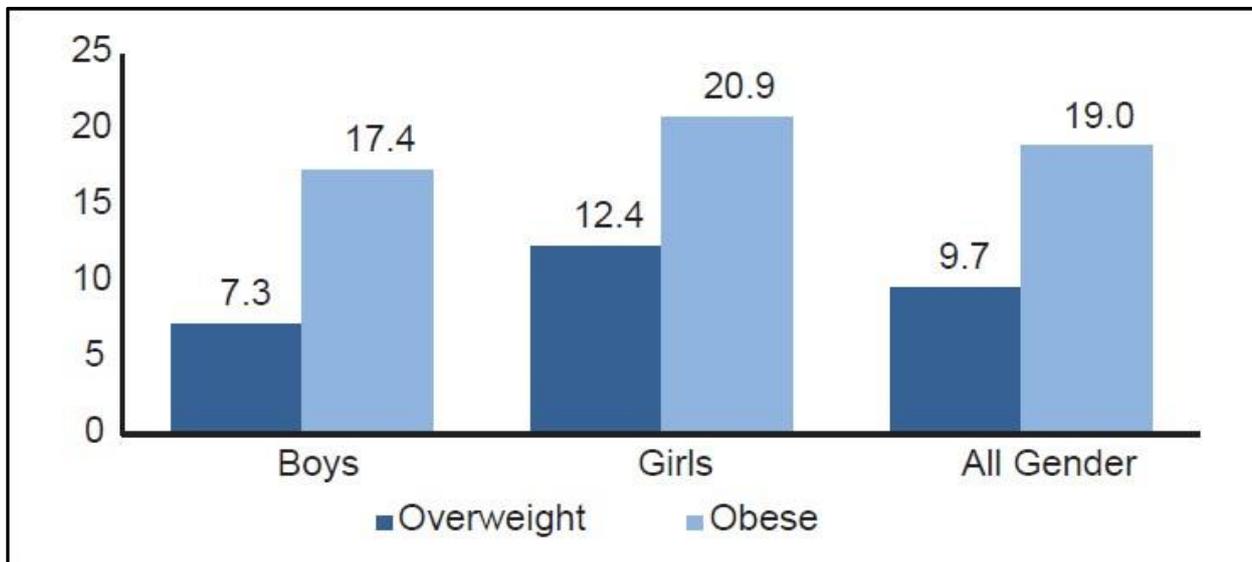


Figure 1: The prevalence of obesity and overweight among Saudi children by gender (M Alqarni, 2016).

DISCUSSION

Saudi Arabia has high rates of overweight and obesity cases, and this has been on the rise for the past two decades. Data obtained from the World Atlas revealed that Saudi Arabia is one of the most obese nations in the world, and this has primarily resulted from increased consumption of junk or western fast foods and the lack of regular exercises. It was observed that Saudi Arabia is experiencing high rates of childhood obesity and high prevalence of diabetes. High prevalence of obesity is usually observed at both the national and the regional levels. Additionally, it is observed in different age groups and among the women and the men. From the study, it was reported that obesity is common among the males in different areas. However, it was reported that obesity is normally prevalent among the females compared to the males. The determinants of obesity customarily include factors such as age, the family history, eating habits, physical activity, and high glucose levels among others. The impacts of obesity in Saudi Arabia and other countries include ischemic heart diseases, diabetes, cardiovascular diseases, and diabetes among others. Obesity in the male gender is often associated with the diagnosis of diabetes, marital status, diet, and hypertension among others. From the study, it was reported that a majority of the children had high glucose levels, and this was correlated with diabetes. Since obesity affects the metabolism of glucose in the human body, it is recommended that both genders should strive to maintain ideal body weight. From the study, it was reported that the prevalence or the rate of diabetes in Saudi Arabia normally increases with obesity. A biological basis has been recommended in the recent past to analyze the impacts of obesity on diabetes. In most cases, obesity can be partly attributed to genetics. Moreover, obesity can also act as a marker of sugar imbalance, and this typically reflects

the difference between energy expenditure and sugar intake. Apart from this study, another investigation conducted in the recent past revealed that the prevalence of diabetes was higher for those male participants who had a BMI of greater than 27. An individual with a high BMI was found to be at high risk of developing obesity, and this means that such a person should engage in physical activities, change the lifestyle, and consume a range of traditional foods such as vegetables. The high cases of diabetes in the Turaif city of the northern part of the country suggest the need for the Saudis to undergo the diabetes management and screening programs.

RECOMMENDATIONS

There is the need to address the issue of high obesity rates among the Saudi children. The promotion of regular physical exercises has been classified as a fundamental public health strategy that can have significant impacts on health enhancement at both the societal and individual levels. There is the need to improve the Saudi parents' awareness and knowledge concerning the prevalence of obesity among their children. One of the most effective approaches that can help in improving the children's health status is developing and establishing collaboration between the parents and the schools. Educational institutions should be at the forefront in creating sustainable enhancements in the Saudi Arabian community's health status. Different school health programs significantly influence the lives of adolescents and children through the improvement of their skills, attitudes, and health-related knowledge. The need to control childhood obesity in most cases requires collaboration between the healthcare agencies, parents, community leaders, food industry, and the schools.

CONCLUSION

Obesity has been regarded and analyzed as a health concern that leads to a variety of cardiovascular diseases and diabetes in different countries including Saudi Arabia. It requires a comprehensive approach which involves addressing the determinants of obesity in Saudi children such as cultural issues, beliefs, education, and social values. Based on this approach, parents need to be aware of the issue of childhood obesity and how it can be addressed. Moreover, it should incorporate various strategies that can encourage the children and the adolescents to be physically active and adopt healthy dietary patterns. Schools operating in Saudi Arabia should act as the main avenues for addressing the problem of childhood obesity. There is the need for the Saudi communities, the government, and the health organizations to work collaboratively to address the prevalence of childhood obesity.

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