

A Systematic Review of Epidemiological, and Time-Trend Prevalence of Obesity-Related Comorbidities and their Health Effects in Saudi Arabia

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ABSTRACT

There has been significant westernization in Saudi Arabia and is one of the countries with the highest prevalence rates of overweight and obesity. According to the study, obesity has become a substantial cause of concern in the country, whereby 70% of people experienced the problem. Obesity was associated with obstructive sleep apnea and osteoarthritis. A systematic and comprehensive search of the selected keywords on PubMed, Medline, and Saudi Digital Library (SDL) database was conducted between November 2020 and January 2021. The result of our study suggests that the prevalence of adult and childhood obesity in Saudi Arabia is extremely high and currently it is undergoing a fast-growing rate of obesity crisis. Genetic factors, reduced physical activity, and high caloric intake contribute to its prevalence. Because of its association with other cardiovascular diseases, it is regarded as a significant matter of concern in Saudi Arabia. Obesity currently considered an epidemic and therefore, is a major public health concern.

KEY WORDS: OBESITY, COMORBIDITIES, HEALTH EFFECTS, DIETARY HABIT.

INTRODUCTION

Obesity has been regarded as a significant global health concern and is characterized by excessive body fat that poses a risk to an individual's health. Obesity is currently associated with many health conditions that can affect the individuals' quality of life, impose stress on the healthcare system and impose an economic burden on the country (Althumiri, Nora A et al. 2021).

Obesity is a risk factor as well as a cause of other comorbidities, including diabetes, cardiovascular disorders, cancers, and other illnesses, leading to diseases and mortality in some situations. There has been a high prevalence of obesity globally throughout the last decade (Memish et al., 2014). Saudi Arabia currently is among top countries with the highest prevalence rates of overweight and obesity, about 40% of the adults were found overweight, while about a quarter were found obese. (DeNicola et al., 2015).

It is argued that there is inadequate research on obesity including its related diseases in the Kingdom of Saudi Arabia (KSA), and this has therefore paused difficulties in government efforts in evaluating and controlling the trend of

obesity in the country (El Nashar et al., 2017). Therefore, it is necessary to review the emerging issues and form a basis for future analysis and projections of the prevalence and the incidence of adult obesity.

METHODOLOGY

A systematic and comprehensive search of the selected keywords on PubMed, Medline, and Saudi Digital Library (SDL) database was conducted between November 2020 and January 2021. The search included only those articles that were published in English. The characteristics defined by the Participant, Intervention, Comparison, Outcome (PICO) system and a series of comprehensive electronic searches and filters were applied. Randomized control trials, pre-post (controlled before-after), interrupted time-series studies and cohort and cross-sectional research were included in this systematic review. However, case reports and reviews that were not published in peer-reviewed articles were not included in this study.

RESULTS

Memish and colleagues conducted a national survey about obesity and the associated risk factors in KSA. The research was conducted through interviews of about 10,000 individuals, aged 15 and above, to collect information on

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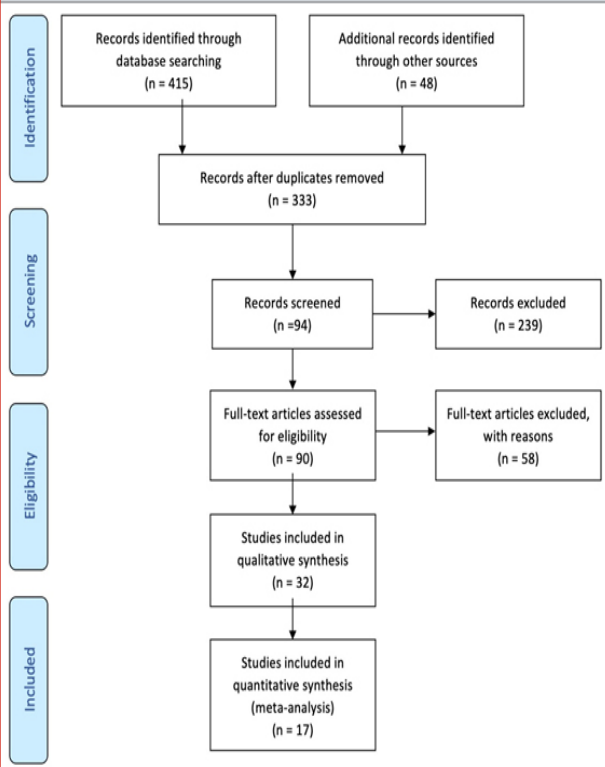
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their social and demographic features, physical activities, dietary and health-related habits, accessibility to health services, and respondents' chronic diseases. The interviews to determine the factors were computer-assisted personal interviews. Of the total respondents 28.7% were found obese, that is, BMI higher than 30 kg/m², which is more common in women than men. Amongst men, obesity was found to be related to the dietary pattern, physical activity, diabetes, hypercholesterolemia, hypertension, and marital status. Amongst the female obesity is linked to a positive history of chronic illnesses, hypertension marital status and education (Memish et al. 2014).

Figure 1: Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow diagram.



A recent study (Horaib et al., 2013) discovered that, the obesity may be a problem brought about by unhealthy dietary habits, lack of physical exercise, consumption of unhealthy food, and the increased psychological stress. Horaib et al. examined the relationship between obesity-associated gene (FTO), fat mass, obesity (BMI), glucose, and other metabolic related traits in Saudi population. It is important to note that the FTO gene's effect can be a factor that could influence the success of efforts to curb obesity, for example, lifestyle interventions (physical activity/dietary habits).

On the other hand, this gene performance may be influenced by environmental or lifestyle factors. At that the FTO can impact on heightened food consumption and craving for high-calorie foods bringing about a lifestyle; this with factors such as age put into consideration whereby it mainly occurs between 7 and 20 years hence obesity due

to FTO's is most common in childhood and adolescents seen through SNPs (Kalantari et al., 2016). The study data is that of 186 female university students, whereby one third have higher glucose levels than usual while a tenth is not obese. However, 50% of the "T" allele students have FTO which is heterozygous.

Understand lifestyle factors and their contribution to obesity among the youth is vital. Data collected from 1400 female and 2906 male secondary school students ascertained this fact. Study participants were living in Al-Khobar, Riyadh and Jeddah, KSA (Al Hazzaa et al., 2014).

Obesity and overweight among males and females have a prevalence of 43.6% and 34.8%, respectively. This is based on anthropometric measurements such as BMI, dietary habits, and physical exercise. Obese adolescents are found to be less active compared to non-obese adolescents. It was found that obesity is significantly inversely proportional to the level of physical activity, vegetable intake, the consumption of sweetened beverages and frequency of meals consumed (Al Mohaimeed et al., 2015).

A study (Elbadawi et al., 2015) to address obesity in school going children in Saudi Arabia, consisting of primary school children aged 6-10 years, show that the average Basal Mass Index is high, while the average body fat is relatively lower in females than males. Therefore, the obesity prevalence is higher in females than in males. The result of our study suggests that the prevalence of adult and childhood obesity in Saudi Arabia is extremely high and currently it is undergoing a fast-growing rate of obesity crisis. Genetic factors, reduced physical activity, and high caloric intake contribute to its prevalence. Because of its association with other cardiovascular diseases, it is regarded as a significant matter of concern in Saudi Arabia.

DISCUSSION

The studies also highlight the association between obesity and diabetes, hypertension, and hypercholesterolemia and what can be termed as a gap that has led to the problem's escalation is the lack of deep understanding and consideration of the risk factors and their relationship. As earlier mentioned, the increase in weight is a contributive aspect of genetics, individual behaviors, and environmental or social-economic factors. The result indicates that obesity is a significant economic burden in Saudi Arabia (Malkin et al. 2022). Some of the points to be considered in individual behaviors are dietary tendencies; this is directly related to body weight outcomes due to caloric intake. The other individual behavior factor is physical activity. Environmental factors are the neighborhood characteristics regarding healthy foods environments compared to environments with restaurants and fast-food joints, presence of recreational facilities to encourage physical activity, etc.

Another study to determine the prevalence of obesity and overweight among clients attending health centers in Southwestern region of the kingdom, in the year 2019 showed that obesity has become a significant health issue of

this 21st century since it has significantly contributed to the occurrence of cardiovascular conditions in most third world countries. The study examined 1681 adult patients, and from the findings of the study, the prevalence of obesity and overweight was 27.6% and 38.3% respectively prevalence of hypertension was highly associated with obesity. An outstanding finding was that the prevalence of overweight and obesity was linked to a higher monthly income. Therefore, according to the study, obesity and overweight are major public health concerns that require interventions in a bottom-up approach, starting with community level and primary prevention programs (Al-Qahtani,2019).

Over the last few years, the overweight and obesity rates of have increased mainly due to consumption of food with high caloric content and a decrease in physical activity. Weight management, characterized by increased physical exercise brings forth better health outcomes for obese individuals. Increased physical exercise for obese individuals increases physical fitness and decreases the risk for the development of eating disorders such as bulimia nervosa and anorexia nervosa, which contribute to psychosocial effects. The study pointed out that there is limited research on the incidence and prevalence of obesity and overweight at the primordial, community-level (Al-Qahtani,2019).

An array of factors that contributed to the rising incidence of obesity, in broader terms, were classified as environmental, behavioral, and biological factors. Behavioral factors included high-fat consumption and sedentary lifestyles. The study also linked obesity with high socioeconomic status. People with a high socioeconomic status spent less energy in daily activities; thus, energy intake was more than body requirements. The study concluded that obesity prevalence differed among various age groups and occupations. The risk factors included family history and dietary patterns. It also emphasized that its vital to create awareness on obesity and overweight and formulate strategies to address these disorders (M Alqarni, 2016).

A study focusing on the prevalence of overweight and obesity among children between two to twenty years demonstrated the epidemiological features indicating that, eastern Saudi Arabia had the highest obesity prevalence rate. The risk factors were higher parental education and a sedentary lifestyle. It was concluded that there is an increasing rate of obesity in childhood in Saudi Arabia which necessitates immediate intervention. There is a need to address the cultural factors that are associated with the high rates of obesity in the country (Hammad et al., 2017). Drastic changes have occurred in the last four decades, which is notable from the significant rising prevalence and occasions of diseases related to a sedentary lifestyle, including ischemic heart diseases, metabolic disorders, and hypertension (Al Daghri et al., 2011).

Obesity and overweight are the two most common causes of coronary artery disease, especially in the female. KSA conducted a national health survey by obtaining data among over 15,000 households between the ages of 30-70 (Ahmed et al., 2014); the researchers reported the prevalence of

obesity and overweight at 35.5% and 36.9% respectively. Females are considered more obesity, while males are significantly more overweight. Another risk factor that resulted from this is the rise of diabetes cases. This is mainly the rise of type two diabetes amongst individuals of 45 years and above if they are found to be overweight or obese. Moreover, excess weight gain amongst young adults may present as a significant risk for diabetes (Reilly, 2011).

Cancer is another factor associated with obesity. Statistics site that an estimated 6% of all cancers are attributed to obesity. The percentage goes up to 7% in women and is about 4% in men (Elkum et al., 2014). Obesity in women thus has been understood to cause breast cancer. A study was conducted to determine this consisted of other different causal factors put in place; in this respect, therefore, the selected sample consisted of illiterate, employed or married women who were obese. Furthermore, in the study, age was also a consideration conducted between women of 22-75 years. According to the results stage, II tumors stood at 56.7%, while stage III tumors were 38.4% (Elkum et al., 2014). According to a study conducted on school-going children to determine the impact of obesity on physical, social, and emotional behaviors, 46% of obese children showed increased stress levels, which interfered with their interaction with other kids (Al-Agha et al., 2016).

With all those outlined, additional research on the interventions put in place, their responses, and impacts resulting from the interventions. It is essential to conduct this on diverse individuals and with individuals with different characteristics. Genetics, individual behaviors, environmental or social-economic should be deeply examined and discussed since they form the critical aspects of most challenges. Other research gaps that could be conducted are on the relationships between the above factors and their expediting overweight and obesity prevalence in the Kingdom of Saudi Arabia.

CONCLUSION

As obesity becomes more common, so do the risk factors, especially in Saudi Arabia, where it is more prevalent than it is worldwide. Obesity treatment typically involves one of three treatment modalities, with psychosocial therapies receiving much less attention. Public health experts, practitioners, and policymakers are urged to apply results to speed up the decrease in the incidence of obesity throughout Saudi Arabia. Obesity currently considered an epidemic and therefore, is a major public health concern.

Data Availability Statement: The database generated and /or analysed during the current study are not publicly available due to privacy, but are available from the corresponding author on reasonable request.

Conflict of Interest: Author declare no conflicts of interests to disclose.

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