

"REGARDING EPIDEMIOLOGY OF DIABETES MELLITUS AND ASSOCIATED RISK FACTORS IN SAUDI ARABIA"

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ABSTRACT

Diabetes Mellitus poses a substantial public health challenge in Saudi Arabia due to escalating prevalence. This paper delves into the epidemiological landscape of diabetes mellitus and its linked risk factors within the country. Comprehensive in scope, the study traverses the historical aspects of diabetes in Saudi Arabia, current prevalence rates, prevalent symptoms, underlying causes, risk determinants, and preventive strategies and concludes with a discussion encompassing the present state and forthcoming implications. In a country grappling with the mounting burden of this disease, this research contributes vital insights for health policymakers and practitioners. The historical context elucidates the evolving nature of diabetes in Saudi Arabia. At the same time, examining risk factors, symptoms, and prevention measures sheds light on the multifaceted aspects of this health challenge. Understanding the complexities surrounding diabetes in the Saudi Arabian context is pivotal for developing effective interventions, health education, and healthcare infrastructure improvements. The findings underscore the urgency of sustainable strategies to curb the diabetes epidemic and pave the way for a healthier future.

Key words:

Broiler chicks, Salmonella, antimicrobial resistance, Sokoto

المخلص:

يشكل داء السكري تحديًا كبيرًا على الصحة العامة في المملكة العربية السعودية بسبب تصاعد انتشاره. تتعمق هذه الورقة في المشهد الوبائي لمرض السكري وعوامل الخطر المرتبطة به داخل الدولة. تتناول الدراسة، الشاملة في نطاقها، الجوانب التاريخية لمرض السكري في المملكة العربية السعودية، ومعدلات الانتشار الحالية، والأعراض السائدة، والأسباب الكامنة، ومحددات المخاطر، والاستراتيجيات الوقائية، وتختتم بمناقشة تشمل الحالة الحالية والآثار المقبلة. وفي بلد يتصارع مع العبء المتزايد لهذا المرض، يساهم هذا البحث برؤى حيوية لواضعي السياسات الصحية والممارسين. يوضح السياق التاريخي الطبيعة المتطورة لمرض السكري في المملكة العربية السعودية. وفي الوقت نفسه، فإن دراسة عوامل الخطر والأعراض وتدابير الوقاية تسلط الضوء على الجوانب المتعددة الأوجه لهذا التحدي الصحي. يعد فهم التعقيدات المحيطة بمرض السكري في السياق السعودي أمرًا محوريًا لتطوير التدخلات الفعالة والتنقيف الصحي وتحسين البنية التحتية للرعاية الصحية. وتؤكد النتائج الحاجة الملحة للاستراتيجيات المستدامة للحد من وباء مرض السكري وتمهيد الطريق لمستقبل أكثر صحة.

الكلمات المفتاحية:

فراخ اللاحم، السالمونيلا، مقاومة مضادات الميكروبات، سوكوتو

INTRODUCTION

A significant number of Saudi Arabians suffer from diabetes mellitus, which places a strain on both the country's healthcare system and its people. Through an examination of its history, prevalence, risk factors, and prevention, this study explores the epidemiology of diabetes in Saudi Arabia in great depth with the purpose of educating healthcare practitioners, policymakers, and the general public. In order to comprehend the occurrence of diabetes in Saudi Arabia, it is necessary to take into account the historical context of the disease (Mokdad et al., 2015). This story of the past gives insight on the social, environmental, and behavioral factors that are responsible for the development of diabetes in the modern era. According to Mokdad et al. (2015), the incidence of diabetes in Saudi Arabia is a significant cause for worry, which has prompted stakeholders in the healthcare sector to actively pursue initiatives to lessen the impact of the disease. Diabetes will typically express itself in a number of different ways, including increased thirst, frequent urination, unexplained weight loss, tiredness, and reduced visual acuity. According to Al Hanawi, Chirwa, and Pulok (2020), the increasing prevalence of diabetes across the country may be ascribed to a variety of factors, such as heredity, obesity, poor eating patterns, sedentary behaviors, and other environmental impacts. This research will also investigate the prevention and control of diabetic crises, including the implementation of public awareness campaigns, improvements to hospital infrastructure, and changes in lifestyle. It is necessary to have an awareness of these indicators in order to develop an effective public health policy to reduce the prevalence of diabetes.

Hyperglycemia, a metabolic disease known as diabetes mellitus (DM), occurs when insulin secretion or action is impaired. Gestational diabetes, type 2 diabetes mellitus, and type 1 diabetes mellitus are the three main forms of this metabolic disorder. A reduction in insulin secretion, known as type 1 diabetes, occurs when the beta cells in the islets of Langerhans are destroyed by the immune system. A decrease in insulin activity caused by insulin resistance in human tissues disrupts glucose entrance to cells, resulting in type 2 diabetes. One possible mechanism by which obesity contributes to type 2 diabetes is via raising insulin resistance.

At least 8.8% of the global population over the age of 20 has diabetes, according to the International Diabetes Federation. In 2017, the prevalence rate of diabetes was 9.6% in countries of the Middle East and North Africa (MENA), and experts predict that number would rise to 12.1% by 2045, making it the most prevalent region in the world in terms of diabetes prevalence. Increases in urbanization, obesity, and the average age of the population are thought to be the main causes of the high DM prevalence in the MENA region. To better prevent and control DM, public health interventions must take into account ways to impact Saudi population behavior. DM is the most common disease in Saudi Arabia and a major economic burden.

Due to the lack of available epidemiological data in earlier decades, it was difficult to get accurate estimates of the prevalence of diabetes. In order to conduct a complete investigation into the phenomena of diabetes, the Saudi government utilized epidemiological surveys, research endeavors, and public health programs. Participation in these events has resulted in a more comprehensive understanding of diabetes across the country. According to a study that was conducted and released by the Saudi government regarding diabetes, it is obvious that Saudi Arabia experienced severe underdevelopment throughout the whole 1950s. This underdevelopment was characterized by a somewhat lower median income in comparison to the United States (El Bcheraoui et al., 2014). Because of this, people consumed fewer processed foods and more fresh vegetables that were produced locally, which led to a reduction in the prevalence of diabetes. Following the rise in the country's median income and the country's increased accessibility to the rest of the world, fast food companies entered the market, and Saudis began adopting a diet more similar to that of the West. In addition, the popularity of soft drinks continued to rise dramatically. Epidemiological studies conducted in the latter part of the 20th century demonstrated a significant increase in the prevalence of diabetes, which disproved the notion that the condition was uncommon and brought it to the forefront of public health concerns. Because of this perspective, healthcare goals, regulations, and finances have been reevaluated, which has made it possible to provide more thorough treatments. As the prevalence of diabetes increased, Saudi Arabia's healthcare system developed to meet the issue. It became possible to diagnose and intervene at an earlier stage as a result of improvements in healthcare infrastructure, access, and diagnostic software. According to Famuyiwa et al. (1992), diabetes awareness initiatives did not only enhance early detection but also educated people on the symptoms and risk factors associated with the disease. Over the course of the last few decades, there has been a drastic shift in the public's perspective toward diabetes in Saudi Arabia. In recent years, there has been a growing recognition that this is not merely a Western anomaly but rather a prevalent indigenous health problem.

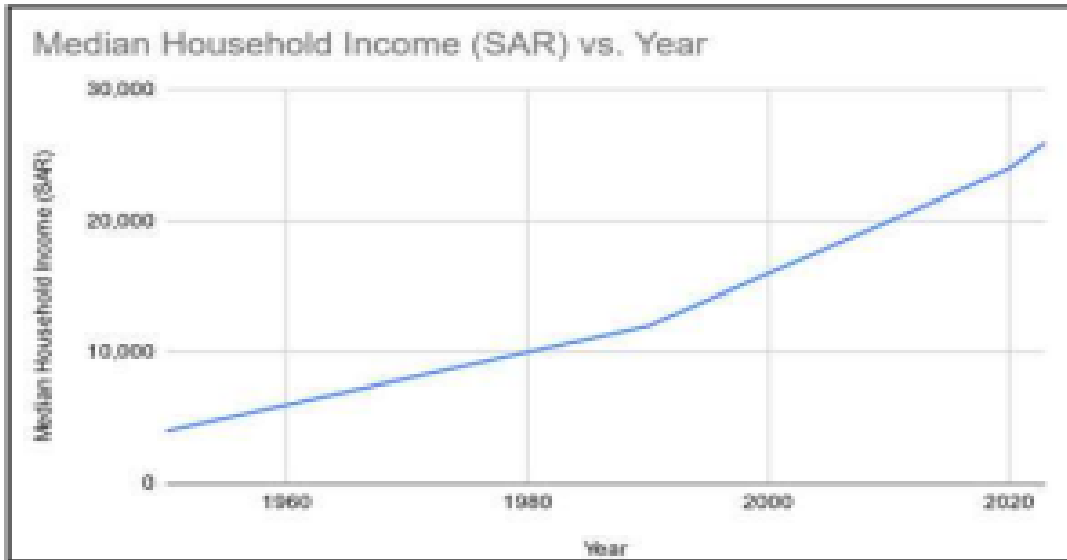


Fig. 1. Showing a Line graph of the median income in Saudi Arabia from 1950 to 2023

Because of this shift in mentality, legislators, healthcare professionals, and the general public have been obliged to address the increasing disease burden caused by diabetes. It is a testament to the dynamic expansion of diabetes that it has gone from being a rare condition to becoming more widespread. According to Mokdad et al. (2015), a condition that was formerly uncommon has evolved into a significant public health problem that calls for comprehensive strategies to control the repercussions of the disease. As a result of early detection, awareness programs, and prevention efforts, the diabetes landscape in Saudi Arabia has been completely revolutionized. The following chronology sheds light on the importance of a proactive and well-informed response to diabetes, as well as the variables that have contributed to the progression of the disease in Saudi Arabia over time.

Prevalence:

A serious public health concern has been brought about by the fact that the prevalence of diabetes in Saudi Arabia has been exhibiting a steady growing trend. The present prevalence rates are depicted in great detail in Chart 1, which highlights the significant and growing burden of the disease, for example, across a variety of age groups.

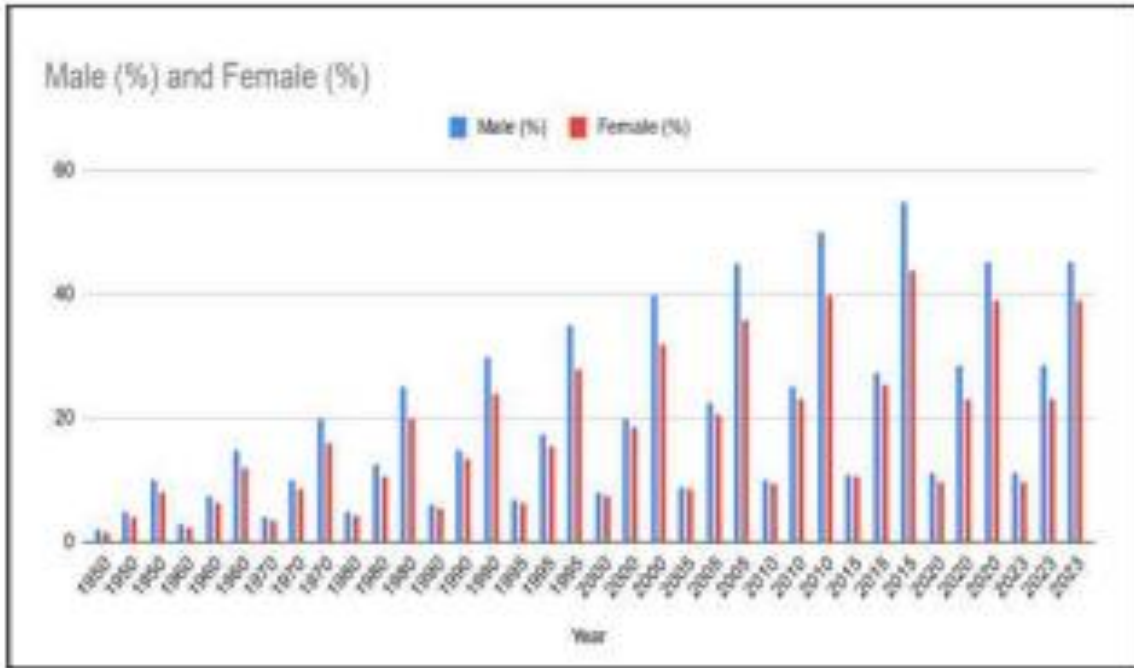


Chart 1. Shows the prevalence of diabetes in Saudi Arabia

Chart 1 provides a comprehensive illustration of the fluctuating prevalence of diabetes in Saudi Arabia over the course of the last ten years. There has been a discernible upward trend in the prevalence rates, which highlights the pressing need for comprehensive ways to address this growing problem in the realm of public health. In the year 2010, 20% of Saudi Arabians between the ages of 20 and 39 were diagnosed with diabetes. Those between the ages of 40 and 59 had a frequency of 25%. In particular, the high prevalence of diabetes among people aged 60 and older, which reached a rate of fifty percent (Robert et al., 2018), was a cause for concern.

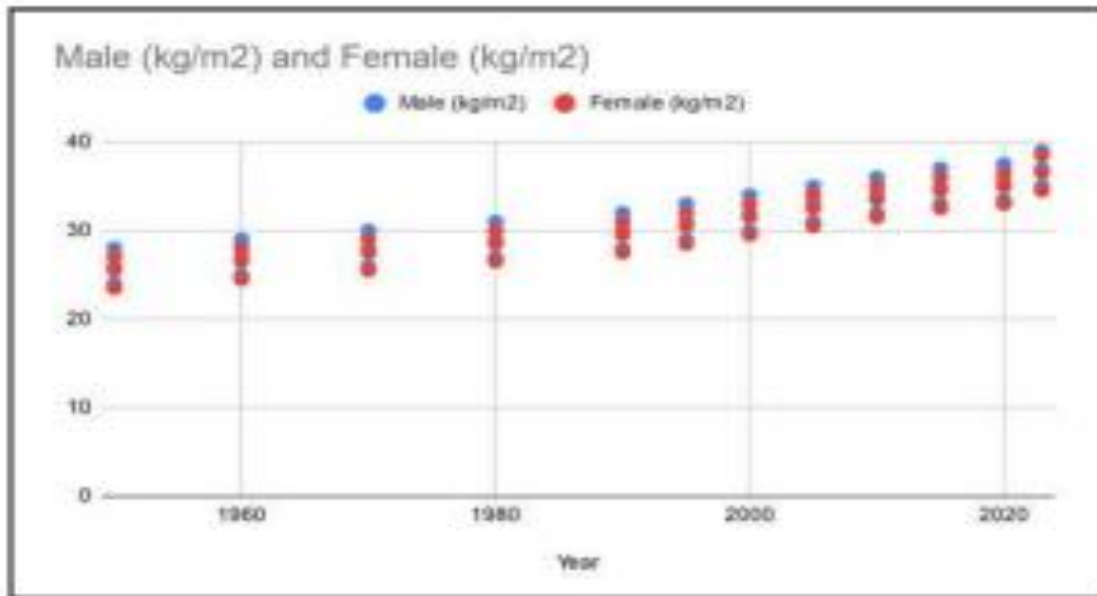


Chart 2. Showing BMI rates in Saudi Arabia

demographic stratification highlights the progressive nature of diabetes and its association with advancing age, establishing it as a key determinant in the country's epidemiological landscape. As the country progressed to the year 2015, prevalence rates showed a noticeable upward trend. The 20-39-year-old prevalence rate has risen to 11%. At 27.5%, the 40-59 age group had a higher prevalence rate (Sami et al., 2020). A prevalence rate of 55% showed that people 60 and older had the greatest influence. The research shows a global rise in diabetes, especially among seniors. Diabetes prevalence increased in the year 2020, with 11.2% among 20-39-year-olds and 28.6% among 40-59-year-olds. The prevalence percentage among persons 60 and older remained at 45.2%. Statistics show a rising prevalence of diabetes, emphasizing the need for early intervention and prevention, especially in middle-aged people Al Hanawi, Chirwa, & Pulok, 2020). The latest data from the year 2023 confirms the concerning trend of increasing diabetes prevalence. The prevalence percentage among those aged 20 to 39 years has remained constant at 11.2%, indicating a sustained burden over some time (Al- Nozha et al., 2004). The prevalence rate of 28.6% seen among individuals between the ages of 40 and 59 underscores the persistent nature of the issue within this particular demographic. Seniors 60 and above had the greatest occurrence rate at 45.2% Al Hanawi, Chirwa, & Pulok, 2020). The above results emphasize the need to continue addressing the diabetes epidemic, particularly in older adults. Diabetes incidence has been increasing in Saudi Arabia, especially, among middle-aged and elderly adults. The patterns above demonstrate the intricate interaction between genetics, lifestyle, and demographics. To better understand and manage diabetes's complicated issues, public health measures, awareness campaigns, and research projects must be prioritized, given the nation's growing burden Al Hanawi, Chirwa, & Pulok, 2020). Chart 1 shows that Saudi Arabia needs comprehensive diabetes mitigation programs and regulations.

Symptoms:

During the process of diagnosing and treating this metabolic condition, it is possible that the identification and interpretation of typical signs of diabetes mellitus will be of critical importance. Diabetes mellitus is characterized by a wide variety of distinct symptoms. Polydipsia, which is also commonly referred to as excessive thirst, is a typical symptom that causes individuals to consume significant amounts of water in order to alleviate their thirst. There is a correlation between this increased fluid consumption and another common symptom, which is polyuria, also known as frequent urination, especially during the night. People who have diabetes may also suffer intense hunger, also known as polyphagia, which is characterized by an insatiable appetite and the consumption of an excessive amount of food.

Despite increased hunger and food intake, persons with type 1 diabetes also have unexplained weight loss, which is a paradoxical trait. This is especially true in those who have type 1 diabetes. Another typical symptom that causes people with diabetes to feel generally exhausted is fatigue. Tiredness is a common symptom. Vision issues are rather prevalent, with fuzzy vision and difficulties focusing being among the most typical things that people face. Diabetes causes an increase in blood sugar levels, which speeds up the healing process of wounds (Sami et al., 2020). The healing process for cuts, wounds, and infections may be sluggish or even nonexistent. Researchers have shown a correlation between the existence of diabetes and an increased risk of acquiring infections in the vaginal region, the urinary system, and the skin.

People who have diabetes are at risk of developing neuropathy, which is characterized by tingling and numbness. Foot and limb degeneration is a common starting point for the condition.

The changes in blood glucose levels have been linked to mood swings, impatience, and difficulties in maintaining emotional control (Mokdad et al., 2015). Ketoacidosis is another condition that patients may display. Ketoacidosis is significantly more prevalent in those who have type I diabetes. Ketoacidosis is characterized by the breath of a patient smelling like alcohol or fruit. In order to facilitate the early diagnosis of diabetes and the appropriate management of the condition, medical practitioners can benefit from the monitoring of these symptoms.

Causes and Risk Factors:

Conditions that occur when the metabolic functions of the body do not function properly are referred to as metabolic illnesses. Diabetes can be caused by a variety of factors, including heredity, changes in behavior, and factors that are beyond the control of the individual. Genes and the history of diabetes in a person's family have a significant impact on diabetic risk. The chance of developing type 2 diabetes is increased by factors such as genetics, family history, and race or culture (Mokdad et al., 2015). The risk factors for developing type 2 diabetes are a bad diet, a sedentary lifestyle, being overweight, and smoking. The risk of developing type 2 diabetes is increased in those who are overweight. Those who eat poorly, eat at irregular times, consume an excessive number of calories, or do not consume enough fiber are among those who are more prone to acquire diabetes, according to researchers. In addition, the progression of diabetes might be influenced by external variables. According to Mokdad et al. (2015), dwelling in urban areas has been associated with the development of unhealthy behaviors, and being in close proximity to pollution, which includes natural toxins, has been linked to an increased likelihood of developing diabetes. There is a correlation between the effects of chronic stress on hormone balance and the development of maladaptive coping mechanisms, which can lead to an increased risk of developing diabetes in individuals. To reduce the risk of developing diabetes, it is essential to implement a comprehensive strategy that takes into account inherited factors, lifestyle alterations, and environmental stressors. The considerations that have been presented above highlight the importance of this approach.

Distribution of Risk Factors:

A pie chart can show population risk variable distribution. Based on statistical data, the pie chart shows Saudi Arabia's diabetes risk factors.

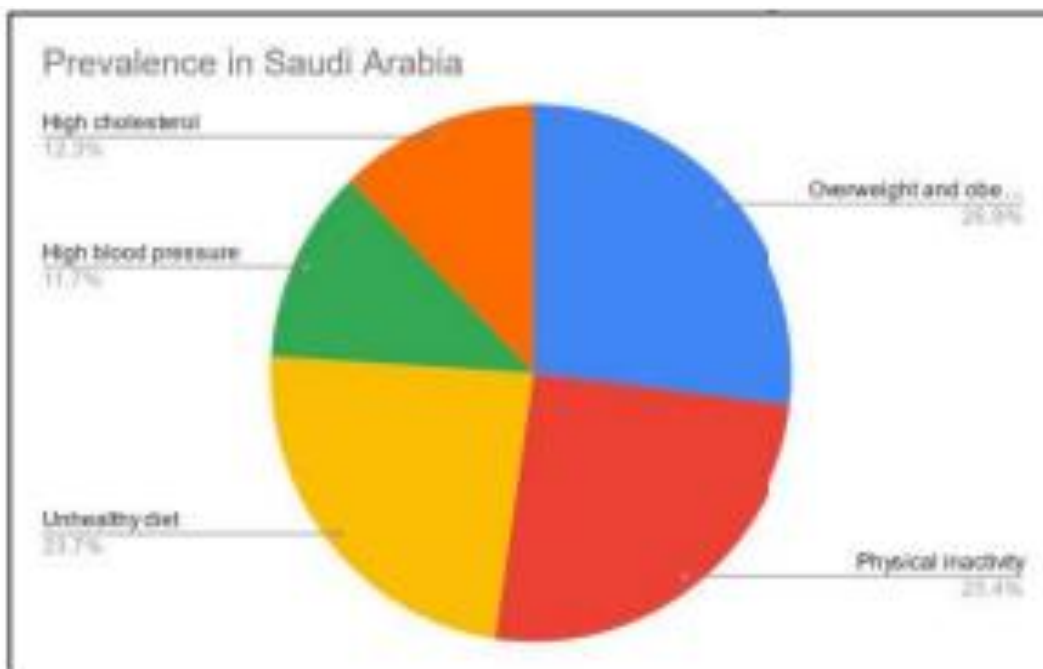


Figure 3. Shows the data as a pie chart

The diabetes risk factor pie chart for Saudi Arabia demonstrates a wide range of risk variables in the population. The risk is increased not only by genes, but also by lifestyle and environment. Genes have a substantial impact. According to Mokdad et al. (2015), in order to lower the prevalence of diabetes, one must incorporate these risk variables into tailored treatment programs. In addition, individuals can be assisted in the implementation of preventative measures by early identification of genetic risk through family history and genetic testing.

DISCUSSION

The prevalence of diabetes in Saudi Arabia, its repercussions, the efficacy of preventative and control measures, as well as the difficulties and potential solutions to this growing health problem are all included in the scope of this study. Through the year 2023, the prevalence of diabetes in Saudi Arabia is projected to rise from 12.4% in 1995 to 28.6%. A significant portion of the senior population, whose incidence currently stands at 45.2% (Mokdad et al., 2015), has been particularly affected by the rise in the prevalence rate of the disease. These numbers are only a small part of the implications that the rising prevalence of diabetes has. One example is how the increasing prevalence of the condition causes a significant burden on the healthcare system and has a negative impact on the overall health of those who are afflicted with it. In addition, the increasing frequency creates financial difficulties for the development of therapy and management measures that are effective. The growing prevalence of diabetes places a strain on healthcare resources and necessitates a substantial degree of investment in diabetes treatment and teaching programs.

The Efficacy of Prevention and Control Measures:

The Saudi government has developed a variety of measures to prevent and control diabetes. These efforts include spreading awareness about healthy lifestyles, expanding access to healthcare, and providing financial support for research. According to Al Hanawi, Chirwa, and Pulok's 2020 research, public education initiatives have encouraged healthy eating and exercise as a means of reducing risk factors associated to lifestyle related issues. The availability of better healthcare has made it possible for diabetic patients to obtain care that is both timely and adequate, which assists in the management of this chronic condition. Despite the fact that there have been more attempts made to manage the disease, the rising incidence of diabetes require additional action. According to Al Hanawi, Chirwa, and Pulok (2020), the current problem is driven by a myriad of complex factors, some of which include, but are not limited to, the aging population, rising rates of overweight and obesity, and shifts in lifestyle patterns. An all-encompassing approach that incorporates timely identification, extensive public awareness initiatives, and policy interventions aimed at addressing the fundamental factors contributing to the illness, such as unhealthy eating habits and a lack of physical activity, has the potential to enhance preventive and control efforts. This approach has the potential to improve the effectiveness of these efforts. The requirement of adopting comprehensive and sustainable strategies that embrace not only the treatment but also primary and secondary preventive measures is one of the major obstacles that is met in the process of treating diabetes in Saudi Arabia (El Bcheraoui et al., 2014). When it comes to diabetes management, Saudi Arabia has a number of essential challenges. Because of the enormous influence that certain lifestyle choices and hereditary factors have, it is vital to have a system that is integrated. In order to implement a holistic approach, it is necessary to address food patterns, encourage regular physical activity, and improve early detection and treatment that is effective. Another significant problem that requires attention is the need to reduce inequalities in the accessibility of healthcare and the different socio-economic situations that exist within the community. It is necessary to establish a system that guarantees the fair and unbiased availability of healthcare services of superior quality to individuals across all demographic categories, regardless of their socio-economic standing or geographical placement (Sami et al., 2020). This is necessary in order to effectively address the management of diabetes. According to Sami et al.'s 2020 research, the ability of Saudi Arabia to successfully implement these programs will determine the country's future success in managing diabetes. Medications that are less expensive and easier to obtain, which are the result of medical research and technology advancements, have the potential to enhance the prognosis for diabetic patients.

CONCLUSION

The rising prevalence of diabetes in Saudi Arabia is demonstrated in this study, which indicates the serious epidemiological impact of diabetes in the country. The aforementioned significant discoveries highlight the importance of addressing this growing concern for the health of the general public immediately. The percentage of people who have diabetes has increased significantly, going from 12.4% in 1995 to 28.6% in 2023. This represents a significant increase. Notable is the fact that the incidence rate among people aged 65 and older is 45.2%. As can be seen from the numbers presented above, diabetes is rapidly becoming more prevalent, which has significant implications for the healthcare system, the quality of life, and the resources available in the economy. It is of the utmost importance to address diabetes in Saudi Arabia. It is imperative that the main preventive plan for the nation include the implementation of awareness campaigns, the promotion of healthy lifestyles, and equal access to healthcare. Additionally, the Saudi government is obligated to provide financial support for research that investigates the varied genetic, behavioral, and environmental factors that contribute to this prevalent disease. The genetic propensity to diabetes, lifestyle adjustments, and innovative diabetes care options should all be the subject of more research in the future. Increased access to healthcare for all demographic groups, promotion of preventative measures, and increased public awareness of health issues are all goals that should be targeted by improved legislation. Diabetes and all of its numerous repercussions need to be managed holistically in order to guarantee the health of the people.

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