

A Survey on the Emerging Primary Chronic Disease and Its Determinants in Hail Region Kingdom of Saudi Arabia: A Retrospective Study

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ABSTRACT

It has been estimated that future generations may live shorter due to a rise in chronic diseases such as lower respiratory disease, obesity, cancer, cardiovascular disease (CVD), diabetes, and stroke. This research aims to determine the emergence of the primary chronic disease and its determinants specifically in Hail region, Saudi Arabia. The researchers employed retrospective-correlational approach conducted at the government subsidized hospitals. Data were collected from year 2017-2021. Results showed that the top five chronic diseases in the Hail region includes; diabetes mellitus (DM), pneumonia, hypertension, chronic obstructive diseases (COPD), and cardiovascular diseases. The age ($t = -0.8748$; $p < 0.001$), the civil status ($t = 2.3123$; $P > 0.000$), and gender ($t = 2.5121$; $p > 0.000$) have significant association to chronic diseases. The result of the current study implicates that addressing the variables that put individuals at risk for developing chronic diseases requires the participation of diverse sectors.

Keywords: Chronic diseases, Emerging, Determinants, Retrospective, Saudi Arabia

INTRODUCTION

As of 2010, chronic diseases accounted for 63 percent of all mortality worldwide¹, and their prevalence is rising among people of all ages, genders, and ethnicities². Since they are linked to high health-care expenses and poor adherence to advised therapy, it offers a greater challenge to primary health care³. Many factors have led to an increase in the burden of chronic disease, which highlights the need for a larger worldwide emphasis on the prevention and treatment of such chronic diseases. Even though many chronic diseases are associated with lifestyle choices that a person can influence, disease prevention is essential to attaining this goal. In order to make an informed choice, health authorities must rely on precise and readily accessible data. In order for the health authorities to improve the health system and the emphasis of their health services, it is necessary to pay particular attention to the problem's scope.

It has been estimated that future generations may live shorter lives due to a rise in chronic diseases such as lower respiratory disease, obesity, cancer, cardiovascular disease (CVD), diabetes, and stroke⁴. Indeed, according to World Health Organization (WHO)⁵ diabetes-related mortality climbed by 70% globally between 2000 and 2019, with male mortality increasing by 80%. Diabetes-related fatalities have more than doubled in the Eastern Mediterranean, representing the highest percentage increase. Moreover, obesity, physical inactivity, and diet-related behaviors have all been associated to an increased risk of morbidity and mortality in people with chronic disease⁶. Obesity has been linked to a variety of health problems and is a well-known risk factor for chronic diseases such as cardiovascular disease, type 2 diabetes, and certain cancers⁷. As such, the importance of physical activity and exercise in enhancing health has progressively spread over the world, yet despite this increasing awareness, global physical activity

levels have stayed steady, and in some cases have been decreasing⁸. Currently, evidence suggests that including daily physical activity (PA) and exercise into one's lifestyle reduces the risk of chronic diseases and death while also serving as a major disease prevention strategy⁹. Such vast of literatures have determined the prevalence of chronic diseases around the world but little is known about chronic diseases that have emerged in the context of Saudi Arabia.

This research aims to determine the emergence of the primary chronic disease of Hail region, Saudi Arabia and association of demographics to the disease. This is to ensure stronger health systems; countries must take immediate action to address chronic diseases and this will make countries healthier population. This research is significant as it addresses the prevalence of rising of chronic diseases as the possibility of productivity of the individual losses.

METHODS

Design: A correlational-retrospective approach was employed. The medical records of patients between the years 2017 and 2022 were used in this study.

Locale/Setting: The setting of this research was at the government-subsidized hospitals of the Hail region, namely, King Khalid Hospital, Hail General Hospital, King Salman Specialist Hospital, and Maternal and Children Hospital.

Data Collection: The researchers sought approval from the hospital directors of the participating hospitals after receiving approval from the Ministry of Health Ethical Review Board. Upon approval, another letter was sent to the records section authority for the retrieval of the patients' medical records.

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Ethical Consideration: This study protocol was approved by the Ministry of Health, Ethical Review Board Number 2021 38. The researchers fully ensure the confidentiality of the data. Any identifying characteristics or marks of the patients shall be strictly concealed.

Data Treatment/ Analysis: The collected data was processed using the Statistical Package for the Social Sciences version 25. Descriptive statistics such as frequency and percentage were used to represent the descriptive statistics, while Pearson was used to note whether demographic profiles are associated with chronic disease.

RESULTS

Table 1 presents the top five chronic diseases in the Hail region of Saudi Arabia. This includes diabetes mellitus (DM), pneumonia, hypertension, chronic obstructive pulmonary disease (COPD), and cardiovascular diseases. In 2017 and 2018, DM appeared to be the most common chronic disease in the Hail region, with 25% and 35.4%, respectively. However, in 2019 and 2020, the cases of pneumonia appeared to be the highest among all the diseases, with 35.4% and 44.7%, respectively. Nevertheless, in 2021, the DM emerged as the most common chronic disease in the Hail region (51%).

Table 2 presents the age, gender, and civil status distribution of the top five chronic diseases in the years 2017–2022. Accordingly, those in the 31- 40 year old, 41–50 year old, and 51–60 year old brackets were the most affected. Females had the highest number of chronic diseases, followed by married people.

Table 1: Top five chronic diseases from year 2017-2021

Year	Diabetes Mellitus	Pneumonia	Hypertension	COPD	Cardiovascular/ Cerebrovascular diseases	Total admission (year)
2017	1345 (25%)	1031 (19%)	1200 (22%)	1000 (18%)	893 (16%)	5469
2018	2121 (35.4%)	1300 (21.7%)	1120 (18.7%)	812 (13.6%)	639 (10.6)	5992
2019	1981 (34.8%)	2015 (35.4%)	900 (15.8%)	600 (10.5%)	204 (3.5%)	5700
2020	1300 (25.3%)	2300 (44.7%)	800 (15.6%)	451 (8.8%)	289 (5.6%)	5140
2021	1984 (51%)	989 (25.4%)	400 (10.2%)	325 (8.3%)	197 (5.1%)	3895

Table 2: Age, gender, and civil status distribution as to the top five chronic diseases in the year 2017-2022

Age range	Diabetes Mellitus	Pneumonia	Hypertension	COPD	Cardiovascular/ Cerebrovascular diseases
< 18 years old	13	17	35	30	14
18–30-year-old	385	680	591	462	272
31 – 40-year-old	1451	1845	1580	1253	865
41-50-year-old	1980	1550	1422	1083	980
51-60-year-old	515	987	1250	1377	778
61 and above year old	945	913	1114	935	986
Gender					
Male	941	120	899	312	189
Female	1066	230	1210	298	204
Civil Status					
Single	274	125	315	189	52
Married	331	350	2300	352	800
Divorced/separated/ widowed	64	50	130	12	125

Table 3: Association between chronic diseases, age, civil status, and gender

Indicators	df	Critical Value	t-value	p-value
Age (years)			-0.8748	0.001*
Civil status	21	3.190	2.3123	0.000*
Gender			2.5121	0.000*

*Significant at .01

Table 3 presents the association between chronic diseases, age, civil status, and gender. The age ($t = -0.8748$; $p < 0.001$) has a significant relationship with chronic diseases. Moreover, there was a significant relationship between civil status ($t = 2.3123$; $P < 0.000$) and gender ($t = 2.5121$; $P < 0.000$) and chronic diseases.

DISCUSSION

This study aims to determine the emergence of the primary chronic disease in the Hail region, Saudi Arabia, and the association of demographics with the disease. It is noted that diabetes mellitus (DM), pneumonia, hypertension, chronic obstructive pulmonary disease (COPD), and cardiovascular diseases emerged as the top five chronic diseases in Hail city, which implies that the prevalence rates of chronic diseases have risen in Saudi Arabia, including Hail, and are predicted to increase. This finding is supported by several studies^{10,11}. The incidence of chronic diseases is growing as the human population ages and life expectancy rises¹². As stated in Moradi-Lakeh and partners' study¹³, sedentary lifestyles, irregular eating habits, and high-calorie diets may explain the significant rise in diabetes in Saudi Arabia. Without proper health education and policy, Saudi Arabia's diabetes rate could rise to pandemic levels, causing micro- and macro-vascular consequences like cardiovascular disease¹⁴. The interplay between pneumonia and COPD may result in an increase in the global disease burden across the world as COVID-19 continues to spread¹⁵. The increase in morbidity underlines the importance of adjusting health systems to better meet the evolving demands of healthcare, namely by enhancing the ability to manage and prevent chronic diseases¹⁶. This is necessary because

the progression of disease is not uniform and changes continuously¹⁷. Hence, the aforementioned patterns are able to be incorporated into the process of adaptation. Patient education is essential in order to obtain good compliance and prevent major consequences for these people, who confront many social, health, and economic challenges. The population that has to be reached should have their knowledge enhanced to a greater degree. Thus, a shift in attitude toward regular exercise, correct food habits, and physical activity, along with adequate health education from educational institutions, governmental and non-governmental groups, and corporations, may improve Saudi Arabians' long-term health. This will lead to a substantial increase in the standard of living for them, as well as a reduction in unnecessary financial responsibilities, and in the near future, their attention will shift to a better way of living.

In 2017 and 2018, DM appeared to be the most common chronic disease in the Hail region, with 25% and 35.4%, respectively. According to data provided by the WHO, the diabetes prevalence rate in Saudi Arabia is the seventh highest in the world and ranks second highest in the Middle East¹⁷. In Saudi Arabia, there are currently roughly seven million people living with diabetes, and an additional three million people living with pre-diabetes¹¹. This trend is driven by rising obesity rates, poor diets, and the demographic age¹⁸. In addition to these personal characteristics, shortcomings in the health care system, environmental barriers to treatment and medical guidance, and cultural opinions on alternative therapies could have contributed to the rise in diabetes in Saudi Arabia¹⁹. National diabetes control requires a multidisciplinary strategy. Saudi Arabia's epidemiology, health education, and diabetes promotion research in comparison to those of high-income countries. Saudi diabetics have inadequate illness knowledge, making them more susceptible to DM²⁰. In the Hail study, Itumalla and colleagues¹¹ concluded that enhancing patient awareness of the condition, its effects and encouraging them to adhere to treatment regimens are required to control this public health concern. Saudi Arabia's health care authorities and politicians must urgently address structural obstacles, such as great distances to treatment facilities, transit challenges, a lack of supported services, and the poor quality of services delivered by health care experts, in this effort²¹. Similarly, in the study of Ansari et al.²², the authors denoted that the Kingdom of Saudi Arabia and the relevant authorities should adopt measures to lessen the burden of DM. However, in 2019 and 2020, the cases of pneumonia appeared to be the highest among all the diseases, with 35.4% and 44.7%, respectively. This is because of the COVID-19 pandemic. This finding aligns with the findings of Ahmed and colleagues²³ investigation. As a result of the pandemic, millions of lives and billions of dollars have been impacted.

Due to the critical lesson learned from the outbreak of MERS-CoV in 2012, Saudi Arabia²⁴ has adopted considerable precautionary and preventative measures and has taken a proactive approach to the management of the COVID-19 pandemic²⁵. Note that in COVID-19 fatality cases in Saudi Arabia, both DM and hypertension were identified as major indicators of death²⁶. Despite the establishment of stringent preventive measures and lockdown, the stated estimation of the mortality rate caused by COVID-19 in Saudi Arabia had increased from 2% to 3.4%²⁷. This is in contrast to the vast majority of countries, all of which have seen a reduction in the number of fatalities, with the exception of Germany, Mexico, and Italy²⁸. These patterns provide an additional perspective on a neglected area of healthcare response, namely the treatment of chronic disease. Additionally, they give an opportunity for the enhancement of healthcare systems, particularly in emergency planning. Nevertheless, in 2021, the DM emerged as the most common chronic disease in the Hail region (51%). The fact that DM looked to be the most prevalent chronic condition in the Hail region in 2017 and 2018 and again in 2021 suggests that there is a setback with

public awareness. In a Hail study by Al-Shammari and colleagues²⁹, raising public awareness about the necessity of preventative measures like healthy lifestyle behaviors and dietary practices is crucial, despite the impending difficulty of sustaining such actions due to a lack of adequate resources and infrastructure.

In this study, those in the 31-40 years old, 41-50 years old, and 51-60 years old bracket were the most affected with the top five chronic diseases which means that as people continue to age, a rising variety of complicated health concerns negatively impact the day-to-day productivity and overall quality of life of many older adults. The occurrence of obesity in more than fifty percent of our older population may be one explanation for the increased prevalence of diabetes and cardiovascular disorders³⁰. This result agrees with previous research conducted in Saudi Arabia and abroad^{31,32}. The consequences of chronic diseases on the lives of the aging are significant when measured in terms of death, disability, family suffering, poverty, and economic loss to the country, despite the fact that medical technology is helping many people cope with these conditions³³. At the same time, the rise of mechanized transportation, elevators, and other forms of sedentary technology has increased the prevalence of lifestyle diseases including diabetes and heart disease¹⁷. For this reason, it is crucial to place more attention on controlling and preventing chronic diseases among the elderly.

Females had the highest number of chronic diseases, which means that differences in cultures, eating habits, and most significantly, obesity, are to blame for this increased occurrence among females. This could also be characterized by hormonal shifts that occur during their lifetimes as they go through the menopause transition, which results in a weakening of their lipid profile³³. These changes have an effect on the metabolism of lipoprotein³⁵. This increases their risk of DM, hypertension, and cardiovascular disease³⁰. As a result of the cultural norms of the community, the majority of Saudi women rely on the male members of the family for transportation³⁴. This increases the danger of inactivity among females because they still adhere to the traditional norms of the culture. Therefore, it is essential for the management of patients to begin with dietary intervention and other changes in lifestyle, as this is the first step in the treatment of patients.

Those who are married have the highest number of chronic diseases, which means marriage has been connected with the development of diabetes, pneumonia, hypertension, COPD, and cardiovascular disorders among Saudis. Past literature has shown that DM, pneumonia, hypertension, COPD, and cardiovascular illnesses were more prevalent in married men and women than in single men and women^{35,36}. In light of the abundance of research suggesting a significant correlation between marital status and chronic diseases, it is impossible to ignore the relevance of providing sufficient assistance to married individuals who suffer from chronic diseases. By modifying key behavioral risk factors, it is possible to significantly improve general health and lower the burden of chronic diseases. This will enable Saudi Arabia to make substantial progress toward reducing morbidity and death caused by the top five chronic diseases.

Age has a significant association with chronic diseases, which means that there is a link between a person's age and their risk of developing chronic diseases. There is an increased incidence of chronic diseases among the world's aging population³⁷ and consistent with research showing that elderly people have more chronic conditions^{38,39}. According to Maresova and partners⁴⁰, most age-related disabilities affect older individuals psychologically as well as physically, and these problems limit activities of daily living. Psychological issues can worsen physical issues, and vice versa. Dynamic interactions can

amplify such issues with mobility, limitations, and cognition, which affect many daily tasks⁴¹. Limitations increase the risk of falling, injury, and fracture, and restrict the individual from visiting open urban settings or socializing. This trauma could deeply harm elderly folks. Thus, helping the elderly lessen the effects of disability, especially motor skill impairments, is a key concern. Unfortunately, the young are also seeing an acceleration in the beginning of chronic diseases due to significant shifts in their lifestyle and behavioral habits⁴². The results emphasize the significance of multi-disciplinary teamwork to meet physical and psychological needs for younger chronic diseases, with mental health specialists ensuring psychological components are addressed in every treatment. Policymakers should establish policies to enable health-care systems to provide improved access to professional mental health support shortly after diagnosis, tailored to the particular and considerable problems young adults with chronic conditions confront.

Also, the civil status was found to have a significant association, which means that depending on whether the individual is single or married, the risk of having chronic diseases is linked. Studies have connected marital status to health-related outcomes, including mortality from chronic diseases⁴³. It has also been observed that marriage is associated with a decreased risk of heart disease and a better overall health status, and that married individuals are less likely to have been diagnosed with cardiac illness, diabetes, or hypertension than unmarried participants⁴⁴. Nonetheless, previous investigation have demonstrated differently³⁶. This disparity can be explained by the good impacts of relationship on an individual's health behaviors and the protective consequences of marriage with the support from partners to pursue medical help and follow to treatment are responsible for the decreased incidence of chronic diseases in married or cohabiting persons⁴⁵. Due to the fact that civil status can alter a person's lifestyle, married and unmarried people may have distinct health protective inclinations⁴⁶.

Further, the gender was found to have a significant association with chronic diseases, which means that there is a link between whether the individual is male or female and certain chronic diseases. According to studies, several chronic diseases are highly connected with gender and are more prevalent among women than men. These results are consistent with those of other investigations^{38,43}. In contrast, several studies conducted in Saudi Arabia and elsewhere have indicated that there is no substantial difference in the number of chronic diseases among men and women^{47,48}. This could be related to the fact that the majority of participants in these studies were men. In general, females live longer than males since males have a higher rate of death from external causes^{38,49}. As indicated in Al-Hanawi³⁸ study, the long life expectancy of women makes them prone to chronic diseases, which are widespread in an aging society. In addition, due to their increased sensitivity to physical symptoms, females utilize healthcare services more frequently than males⁵⁰, thus, females are more likely to obtain a diagnosis than males. Consequently, it is essential for the healthcare system to explore health initiatives that address gender-based disparities in the prevalence of chronic diseases. One of the key objectives of Vision 2030 implementation in Saudi Arabia is to reduce the gender gap in terms of personal income, education, and labor force participation⁴⁹.

Study Implication: It appears that substantial efforts are being made to realign Saudi Arabian health services toward chronic disease prevention and management. It is essential to routinely distribute the outcomes of the appraisal of chronic disease programs and policies to a variety of stakeholders through publications in order to aid in continuous improvement initiatives and develop effective solutions. It is necessary to implement a surveillance system that provides the data necessary

to analyze the impact of chronic diseases on various groups by age, gender, civil status, and geography, as well as monitor the progress of preventative initiatives. Activating partnerships with government and nonprofit organizations, the commercial sector, educational institutions, healthcare systems, and civil society to promote health and manage chronic diseases by implementing joint programs and activities between the necessary authorities would require multi-sectoral engagement. The collaboration of multiple sectors helps to address the risk factors of chronic diseases in a targeted manner by easing the pooling of resources and encouraging the development of common goals.

CONCLUSION

By means of data from the hospital records, this study examined the most leading chronic disease. We observed that DM, pneumonia, hypertension, chronic obstructive pulmonary disease (COPD), and cardiovascular diseases appeared as the top five chronic diseases in Hail City from 2017 to 2021. Also, those in the 31–60 age bracket who were female and married were the most affected by the top five chronic diseases. Age, civil status, and gender were found to have significant associations with chronic diseases. The result of the current study implicates that addressing the variables that put individuals at risk for developing chronic diseases requires the participation of diverse sectors.

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