

Examining The Impact Of Air Pollution On Respiratory Illnesses In Urban Areas Of Saudi Arabia

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Abstract

Air pollution is a persistent environmental and public health issue that affects populations globally. In recent years, the rapid industrialization and urbanization of Saudi Arabia has led to a significant increase in air pollution levels in its urban areas. This has raised concerns about its potential impact on respiratory health in the population. This qualitative review paper aims to examine the impact of air pollution on respiratory illnesses in urban areas of Saudi Arabia. It seeks to identify the various sources of air pollution in urban areas and understand how they contribute to respiratory illnesses. Additionally, it will explore the current government policies and initiatives aimed at reducing air pollution levels and their effectiveness. The review process involved a thorough analysis of existing literature, including research studies, government reports, and other relevant sources. Our findings suggest that air pollution in urban areas of Saudi Arabia is mainly caused by industrial activities, transportation, and household activities. These pollutants have been linked to various respiratory illnesses, including asthma, chronic obstructive pulmonary disease (COPD), and lung cancer, which have become major public health concerns in the country. Moreover, our review highlights that the implementation of stricter regulations and policies by the government has shown some promising results in reducing air pollution levels. However, there are still challenges in enforcing these regulations effectively. Additionally, there is a lack of awareness and understanding among the public about the health risks associated with air pollution, which calls for more education and public health initiatives. In conclusion, this qualitative review sheds light on the key factors contributing to air pollution and its impact on respiratory health in urban areas of Saudi Arabia. It highlights the need for further research and evidence-based interventions to address this issue and protect public health.

Keywords: *Impact of air pollution, air quality, respiratory illnesses, urban areas, Saudi Arabia.*

Introduction

The Kingdom of Saudi Arabia (KSA) has consistently been ranked as one of the top oil-producing countries in the world, with its economy heavily reliant on petroleum exports. In

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recent years, the rapid urbanization and industrialization in KSA has led to a significant increase in air pollution levels, particularly in urban areas (Farahat, 2016). This rise in air pollution has raised concerns about its potential impact on public health, particularly on respiratory illnesses. According to the World Health Organization (WHO), air pollution is responsible for approximately 4.2 million deaths globally each year, with respiratory illnesses being one of the leading causes of mortality (WHO, 2020). The increasing severity and prevalence of respiratory illnesses in Saudi Arabia, coupled with high levels of air pollution, make it a critical and pressing issue that requires urgent attention.

In recent years, there has been a growing body of research examining the impact of air pollution on respiratory health in urban areas of Saudi Arabia (e.g., Habeebullah (2013)). However, most of these studies have focused on quantitative analysis, such as measuring pollutant levels and their association with respiratory illnesses. While these studies provide valuable insights into the link between air pollution and respiratory illnesses, they often overlook the experiences and perspectives of individuals living in these urban areas. As a result, there is a lack of understanding of how air pollution affects the daily lives of people and their perceptions of the risks associated with it.

To address this gap in knowledge, this qualitative review paper aims to analyse and synthesize existing research on the impact of air pollution on respiratory illnesses in urban areas of Saudi Arabia. The review will focus on the experiences and perceptions of individuals living in these areas to gain a better understanding of the issue from their perspective. This will provide a more comprehensive and nuanced understanding of the impact of air pollution on respiratory health in urban areas of KSA.

The findings of this review will contribute to the existing body of knowledge on the impact of air pollution on respiratory health in urban areas of Saudi Arabia. It will also provide insights into the lived experiences and perspectives of individuals, which can inform policy and interventions to address this issue. By incorporating the voices of those most affected by air pollution, this review aims to give a more comprehensive understanding of the issue and pave the way for more targeted and effective solutions.

In conclusion, air pollution poses a significant threat to the health and well-being of individuals living in urban areas of Saudi Arabia, particularly in terms of respiratory illnesses. This qualitative review paper seeks to deepen our understanding of this issue by incorporating the experiences and perspectives of individuals living in these areas. The insights gained from this review can provide a more holistic understanding of the impact of air pollution on respiratory health and inform strategies to mitigate its effects in urban areas of Saudi Arabia.

Methods & Results

Methodology

This qualitative review paper aims to examine the impact of air pollution on respiratory illnesses in urban areas of Saudi Arabia. The methodology used for this study consists of a comprehensive review and analysis of existing literature on the topic. The primary sources of data for this study are academic articles, reports, and government publications from the past 10 years (2011-2021). A systematic search of online databases such as Google Scholar, PubMed, and ScienceDirect was conducted using keywords such as "air pollution", "respiratory illnesses", "urban areas", and "Saudi Arabia".

The inclusion criteria for the literature were as follows: 1) studies conducted in urban areas of Saudi Arabia, 2) studies focusing on the impact of air pollution on respiratory illnesses, and 3)

studies published in English. Studies that did not meet these criteria were excluded from the review.

The selected studies were analysed using a thematic analysis approach. This involved identifying key themes and patterns across the literature to gain a comprehensive understanding of the impact of air pollution on respiratory illnesses in urban areas of Saudi Arabia. The themes were then organized and synthesized to develop a coherent narrative on the topic.

Results

The results of this qualitative review paper are presented below, organized according to the main themes that emerged from the literature.

1. Types of Air Pollutants in Urban Areas of Saudi Arabia:

The literature revealed that the primary air pollutants in urban areas of Saudi Arabia are particulate matter (PM), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), and ozone (O₃). PM is the most common air pollutant in Saudi Arabia, with levels exceeding the World Health Organization (WHO) guidelines in most cities. Studies have shown that the concentration of PM in urban areas of Saudi Arabia is mainly influenced by traffic emissions, industrial activities, and construction sites. (Alotaibi, et al., 2020).

2. Prevalence of Respiratory Illnesses in Urban Areas of Saudi Arabia:

The literature also revealed a high prevalence of respiratory illnesses in urban areas of Saudi Arabia. Studies have reported a significant increase in the number of hospital admissions and emergency room visits due to respiratory illnesses, such as asthma, chronic obstructive pulmonary disease (COPD), and bronchitis. The prevalence of these illnesses has been linked to the high levels of air pollution in urban areas. (Wali, et al., 2014).

3. Impact of Air Pollution on Respiratory Illnesses in Urban Areas of Saudi Arabia:

The literature consistently showed a strong association between air pollution and respiratory illnesses in urban areas of Saudi Arabia. PM was found to be the most significant contributor to respiratory illnesses, with high levels of PM linked to an increased risk of asthma, COPD, and bronchitis. Exposure to high levels of NO₂ and SO₂ has also been linked to an increased risk of respiratory symptoms, such as coughing, wheezing, and shortness of breath. (Alharbi, et al., 2014).

4. Vulnerable Population:

Studies have shown that certain groups of people are more vulnerable to the effects of air pollution in urban areas of Saudi Arabia. These include children, the elderly, and people with pre-existing respiratory conditions. Children living in urban areas with high levels of air pollution are at a higher risk of developing respiratory illnesses, as their lungs are still developing. The elderly and people with pre-existing respiratory conditions are also at a higher risk of experiencing exacerbations of their conditions when exposed to high levels of air pollution. (Abubakar & Dano, 2020).

5. Government Initiatives and Policies:

The literature revealed that the government of Saudi Arabia has implemented several initiatives and policies to address the issue of air pollution in urban areas. These include the national air quality monitoring system, stricter emissions standards for vehicles, and regulations for industrial activities. However, there is a need for more stringent enforcement of these policies to reduce the levels of air pollution in urban areas. (Farahat, 2016).

6. Public Awareness and Perception:

The literature also highlighted the lack of public awareness and understanding of the impacts of air pollution on respiratory health in urban areas of Saudi Arabia. Studies have shown that most people are not aware of the sources and health effects of air pollution, which can lead to a lack of concern and complacency towards the issue. (Almulhim & Abubakar, 2021).

7. Mitigation and Adaptation Strategies:

Several studies have proposed mitigation and adaptation strategies to reduce the impact of air pollution on respiratory illnesses in urban areas of Saudi Arabia. These include adopting cleaner energy sources, implementing stricter emissions standards, and increasing green spaces in urban areas. Additionally, improving public awareness and understanding of the issue can also contribute to mitigating the effects of air pollution on respiratory health. (Abubakar & Dano, 2020; Al-Thani, et al., 2018).

8. Research Gaps:

The literature revealed some research gaps in the existing studies. Most studies focused on the impact of air pollution on respiratory illnesses in general and did not explore the different types of air pollutants in detail. Moreover, there is limited research on the long-term effects of air pollution on respiratory health in urban areas of Saudi Arabia. Future studies should address these research gaps to gain a better understanding of the issue.

Conclusion

In conclusion, this qualitative review paper has examined the impact of air pollution on respiratory illnesses in urban areas of Saudi Arabia. The results indicate a strong association between air pollution and respiratory illnesses in urban areas, with PM being the most significant contributor. Children, the elderly, and people with pre-existing respiratory conditions are considered to be more vulnerable to the effects of air pollution. The government has implemented various initiatives and policies to address this issue; however, there is a need for stricter enforcement and increased public awareness. Further research is needed to address the research gaps identified in this study and develop effective mitigation and adaptation strategies.

Discussion & Conclusion

Discussion

The aim of this paper was to examine the impact of air pollution on respiratory illnesses in urban areas of Saudi Arabia. Through a qualitative review of existing literature, this paper has highlighted several key findings regarding the effects of air pollution on respiratory health in Saudi Arabia.

Firstly, it is evident that air pollution levels in urban areas of Saudi Arabia have exceeded safe limits, with high levels of particulate matter, sulfur dioxide and nitrogen dioxide being reported in cities such as Riyadh and Jeddah. This can be attributed to a rapid increase in industrialization and urbanization, as well as high levels of traffic and energy consumption. As a result, individuals living in urban areas are at a high risk of being exposed to harmful pollutants on a daily basis. (Wali, et al., 2014).

Secondly, the literature has consistently pointed to a strong link between air pollution and respiratory illnesses in urban areas of Saudi Arabia. Studies have shown that exposure to pollutants such as PM_{2.5} and PM₁₀ can increase the risk and severity of respiratory illnesses such as asthma, chronic bronchitis, and chronic obstructive pulmonary disease (COPD). This

is particularly concerning for vulnerable populations such as children, the elderly, and those with pre-existing respiratory conditions. (Alharbi, et al., 2014).

Moreover, it is important to note that the impact of air pollution on respiratory health is not limited to physical health. Several studies have also highlighted the psychological impact of living in heavily polluted urban areas. Residents, especially those with respiratory illnesses, reported high levels of stress, anxiety, and decreased quality of life due to their constant exposure to pollutants. This highlights the need for a holistic approach in addressing the issue of air pollution in urban areas of Saudi Arabia.

This paper also identified various factors that contribute to the severity of the impact of air pollution on respiratory health in Saudi Arabia. These include geographical location, socio-economic status, and gender. For instance, individuals living in highly industrialized areas, with low socio-economic status, and those who are exposed to indoor air pollution from cooking and heating fuel are at a higher risk of developing respiratory illnesses. In addition, women in Saudi Arabia are also disproportionately affected due to the cultural norm of staying indoors, which exposes them to indoor pollutants for extended periods.

Furthermore, the literature has also highlighted the inadequate monitoring and reporting systems for air pollution in Saudi Arabia. This makes it difficult to accurately assess the full extent of the problem and implement targeted interventions. There is a need for further research and the development of a comprehensive air quality monitoring system to fully understand the impact of air pollution on respiratory health in urban areas of Saudi Arabia.

Conclusion

In conclusion, this qualitative review has shed light on the significant impact of air pollution on respiratory health in urban areas of Saudi Arabia. The findings of this paper highlight the urgent need for action to address this issue. It is evident that the rapid urbanization and industrialization of the country have led to high levels of air pollution, which have had a detrimental effect on the respiratory health of its residents.

The government of Saudi Arabia needs to take immediate and comprehensive measures to address this issue. This includes implementing stricter regulations and enforcing them, investing in clean and renewable energy, and promoting sustainable transportation methods. In addition, there is a need for public education and awareness campaigns to encourage individuals to take personal responsibility and adopt healthier lifestyle choices to reduce their exposure to pollutants. (Farahat, 2016).

Moreover, there is a need for further research in this area, particularly in understanding the specific sources and types of pollutants and their effects on respiratory health. This will aid in the development of targeted interventions to mitigate the impact of air pollution on respiratory illnesses in Saudi Arabia.

In conclusion, air pollution is a significant health issue that requires urgent attention in Saudi Arabia. It is vital for the government, healthcare professionals, and individuals to work together to reduce air pollution levels and protect the respiratory health of their citizens, particularly those living in urban areas. Only through collective efforts and effective interventions can the negative impact of air pollution on respiratory health be minimized in Saudi Arabia.

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