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Prevalence of Asthma and Related Factors Among Adolescents

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Abstract

Objective: This research aims to evaluate the prevalence of asthma among adolescents and identify associated factors within health centres in Mosul, Iraq.
Study Methodology: A cross-sectional, descriptive study was conducted in Mosul's health centers, including the Al-Sfina, Umm Al-Manasis, Al-Houd and Ashwirat health centers, between May and July. The study focused on patients with asthma in adolescents, with a sample size of at least 290 based on the G-Power analysis for cases where the universe is unknown. Data collection involved face-to-face interactions, using the "personal information model" and the International Study of Asthma and Allergies in Childhood (ISAAC) scale.
Results: The study included adolescents aged 6-17 years diagnosed with asthma, with a higher prevalence among women. Statistical analysis revealed a positive and significant correlation between asthma risk factors and age, income, economic level, smoking, and chronic diseases ($p < .05$). No significant relationship was found between asthma risk factors, gender, and family size.
Conclusions The study concludes that adolescents face elevated risk factors, highlighting the need for targeted interventions.
Recommendations: The study suggests implementing educational courses for patients and their families to improve disease management.

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INTRODUCTION

Asthma, a chronic respiratory condition characterized by recurrent episodes of wheezing, breathlessness, chest tightness, and coughing, continues to be a significant global health concern (Padem & Saltoun, 2019). Its impact is particularly profound among adolescents, since this transitional phase between childhood and adulthood represents a critical period for the development and management of respiratory health (Billo et al., 2023; Verma et al., 2023). In the context of Mosul, Iraq, where health challenges have been compounded by recent geopolitical events, understanding the prevalence and associated factors of asthma among adolescents becomes crucial for informed public health interventions. The prevalence of asthma in adolescents is influenced by a complex interplay of genetic, environmental, and lifestyle factors (Clemente-Suárez et al., 2023; Vincenzo et al., 2023). Although global estimates suggest a rising trend in asthma prevalence, regional variations are evident, necessitating region-specific investigations to tailor interventions effectively (Garg et al., 2024; Laubhahn & Schaub, 2023). Mosul, as a city that has experienced substantial disruptions in its health system, requires a focused examination of the prevalence of asthma and related factors to inform targeted healthcare policy and initiatives. This study aims to contribute to the existing body of knowledge by investigating the prevalence of asthma among adolescents attending health centers in Mosul, Iraq. By examining demographic, environmental, and lifestyle factors, we seek to identify potential determinants of asthma in this population. Furthermore, this research aims to provide a basis for the development of evidence-based strategies to mitigate the burden of asthma in the adolescent population in Mosul. Understanding the epidemiology of asthma in Mosul adolescents is essential not only for healthcare providers and p.

policymakers, but also for affected individuals and their families. It offers insight into the unique challenges facing this population, potentially paving the way for targeted preventive measures, early diagnosis, and effective management strategies. Through this research, our aim is to foster a comprehensive understanding of the prevalence and factors that contribute to asthma among adolescents in Mosul, ultimately contributing to improving respiratory health outcomes in this vulnerable demographic.

MATERIALS AND METHODS

Research Design and Subjects:

This study adopts a descriptive study design to investigate the prevalence of asthma and its associated factors among adolescents attending health centers in Mosul, Iraq. Research will be carried out in health centers within the city of Mosul during the period of May to July. The study population comprises 1180 adolescents diagnosed with asthma who sought medical attention in specified health centers, including the Al-Safina Health Center, the the Umm Al-Manasis Health Center, Al-Houd Health Center and the Ashwirat Health Center. Using G. Power analysis, a sample size of 290 participants was determined. The inclusion criteria included adolescents aged 6 to 17 years actively seeking medical care in designated centers, willing to participate in the research, while the exclusion criteria included people with mental disorders and those who did not participate.

Data Collection Tools:

A. Personal Information Form (Appendix 1):

- Includes age, gender, educational status, and smoking status.

B. International Study of Asthma and Allergies in Childhood (ISAAC):

- Consists of four subdimensions.
- First dimension (7 questions): Addresses nasal problems without cold or influenza.
- Second dimension (6 questions): Focuses on skin problems.

Third dimension: ISAAC (4-point scale): Assessing the frequency of wheezing.

- Fourth dimension (6 questions): Examines factors associated with current wheezing among participants (adapted from Shaker et al., 2022).

Data Analysis:

Data will be analyzed using SPSS software employing descriptive statistics such as frequency, percentage, mean, standard deviation, and one-way analysis of variance (ANOVA). The significance level for the evaluation of the data will be set at P <0.05.

Ethical Dimension of Research:

Ethical approval was obtained from Iraq on 25 May 2022. The researcher provided a detailed description of the purpose and methodology of the study and submitted it to the Nineveh Health Directorate for approval. Participants were orally informed of the study objectives, ensured voluntary participation, confidentiality, and the right to withdraw at any point without penalty. No names were recorded during data collection to ensure participant confidentiality.

RESULTS

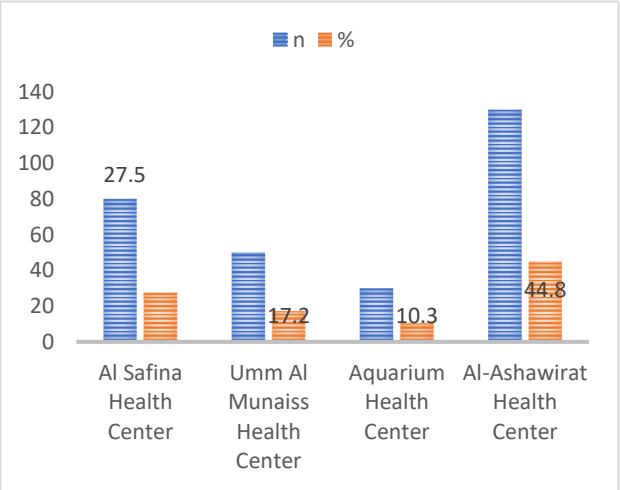

Figure 1. Relative distribution of the study population by health center

The Al-Ashawirat Health Center represents most of the study sample (44.82758621%) and the rest is distributed to other health centers. (27.5862069%) at the Al Safina Health Center and (17.24137931%) at Umm Al Munaiss Health Center and (10.34482759%) at the Aquarium Health Center. Table 4.1. The table shows that the average age of the participants is 13.9138 ± 2.78208. It also indicated that most of the study sample (70%) are women and the rest are men, and most of them have a sufficient income level and represent 53.1% of the total sample. Regarding family size, the largest number of them was family size ranged from 4-5, where it constituted 40.9% of the sample, followed by 33.1% of the study sample, the family size was 6 and more, and the lowest percentage was <3, where it constituted 24.5%. In terms of smoking, most of the sample (75.2%) were non-smokers and the rest were smokers. Regarding chronic diseases, most of the study sample did not suffer from chronic diseases, since they constituted (71.7%) and the rest suffered from chronic diseases. As in Table 4.2, the results of this study showed that there is no significant effect between age and nasal problems, and there is a significant effect between age and skin problems, and the highest value was for the age group 15-17 with an arithmetic mean and standard deviation of 6.0000 ± 2.79610, p. 0.014 * as shown. The results showed that there was a significant effect between age and between 2.79610, and the highest.

the value of the age group was 15-17 with a mean and standard deviation of 15.3333 ± 5.26279, p. 0.016*, and there was a significant effect between age and specific AA, and the highest value for the age group 15-17 was with an average of 10.5833±2.10878, p= 0.012 * There was no significant effect between age and factors associated with current wheezing. The findings presented in Table 4.3 elucidate the relationship between Asthma risk factors, as evaluated by the International Study of Asthma and Allergies in Childhood (ISAAC), and gender within the research group. Mean scores for nose problems, skin problems, prevalence and severity of AA symptoms, specific AA symptoms, and factors associated with current wheezing were compared between male and female participants. The results of the t-test indicated that there were no statistically significant differences between the sexes in these risk factors, with p values ranging from 0.167 to 0.867. This suggests a comparable distribution of asthma-related symptoms between male and female adolescents in the study cohort, highlighting the need to further exploration of possible gender-specific factors that influence respiratory health in this population.

Table 1: Descriptive characteristics of the Research Group (n=290)

Descriptive Features	Min.	Max.
Age Mean Mean ± SD: 13.91 ± 2.78	9.00	17.00
Gender	n	%
-Male	87	30
Female	203	70
Economic Level		
Enough	154	53.1
Not Enough	136	46.9
Family size		
3	71	24.5
4-5	121	40.9
6 and more	98	33.1
Smoking		
Yes.	72	24.8
No	218	75.2
Presence of Chronic Disease		
Yes.	82	28.3
- No	208	71.7

Table 2: Relationship between risk factors for AA and age according to ISAAC for the research group (n = 290) ANOVA analysis, P<0.05

Variables	**Age**	**n**	**M**	**SD**	**F**	**P-value**
Nose Problems	6-10.	238	12.54	4.05	2.08	0.127
	11-14	34	11.68	4.13		
	15-17	12	10.42	4.38		
Skin problems	6-10.	238	8.26	2.82	4.34	0.014*
	11-14	34	7.47	3.31		
	15-17	12	6.00	2.80		
Prevalence and severity of AA symptoms	6-10.	238	10.47	6.02	4.19	0.016*
	11-14	34	9.82	5.41		
	15-17	12	15.33	5.26		
Specific AA symptoms	6-10.	238	7.61	3.96	4.48	0.012*
	11-14	34	6.74	3.38		
	15-17	12	10.58	2.11		
Factors Associated with Current Wheeze	6-10.	238	7.40	1.89	2.04	0.132
	11-14	34	6.88	2.01		
	15-17	12	6.58	1.08		

Table 3: Relationship between risk factors for AA and gender based on the ISAAC for the research group

Variables	Gender	N	Mean	SD	t	p-value
Nose Problems	Male	81	12.28	4.06	-0.168	0.867
	Female	203	12.37	4.11		
Skin problems	Male	81	7.73	2.85	-1.239	0.216
	Female	203	8.20	2.93		
Prevalence and severity of AA symptoms	Male	81	9.86	6.56	-1.308	0.192
	Female	203	10.89	5.73		
Specific AA symptoms	Male	81	7.52	4.15	-0.306	0.760
	Female	203	7.67	3.78		
Factors Associated with Current Wheeze	Male	81	7.21	2.00	-0.523	0.601
	Female	203	7.34	1.84		

DISCUSSION

The findings of this study shed light on the frequency of AA among adolescents and children seeking medical attention in health centers in Mosul, Iraq. A considerable fraction of Mosul's juvenile population is affected by AA, as evidenced by the study's finding that the majority of participants were male and had a mean age of 13.91 years. The results of the study also revealed that the Al-Ashawirat Health Center had the highest proportion of participants, followed by the Al Safina Health Center, the Umm Al Munaiss Health Center and the Aquarium Health Center. This shows that the prevalence of AA can vary between the various health facilities in Mosul, perhaps due to various environmental and societal causes. The study also examined the connection between demographic information and the prevalence of AA and found no significant relationship between family income and prevalence, suggesting that AA affects people of all socioeconomic backgrounds equally. However, the majority of the interviewees reported having an adequate level of income, which may not accurately reflect the financial situation of Mosul's general population. According to the study findings on family size, most of the participants had families of between 4-5 individuals. Larger families may be more exposed to environmental allergens and pollutants, which are known risk factors for AA, even if the size of the family did not significantly affect the incidence of AA. Smokers had a higher incidence of AA than nonsmokers, which was another substantial influence that smoking had on the prevalence of AA. This research emphasizes how crucial it is to work with families to help young people quit smoking to reduce the prevalence of AA. Finally, the fact that most of the participants did not disclose any chronic diseases suggests that AA is a common health problem among children and adolescents in Mosul, who are generally healthy and seek medical attention. The findings of this study can help medical professionals and policy makers in creating plans to manage and prevent AA in children and adolescents in Mosul, Iraq. The findings of this study offer significant new information on the frequency and severity of asthma symptoms in children and adolescents in the study population. The fact that practically every child and adolescent had nose problems is in line with previous studies showing that allergic rhinitis is a typical comorbidity in people with asthma. According to research, people with asthma often develop atopic dermatitis, which can aggravate asthma symptoms. The high incidence of skin problems

reported by study participants is consistent with this finding. The severity of asthma symptoms was rather modest and most subjects reported no serious symptoms, despite the high prevalence of nose and skin problems. This is positive because severe asthma symptoms can negatively affect a person's quality of life and increase their chances of developing complications from the disease. It should be noted that a significant percentage of participants continued to report having specific asthma symptoms, including wheezing, as it shows that asthma is still a serious health problem in the research population. The results of this study further emphasize how crucial it is to recognize and manage asthma risk factors that can be changed. For example, only a small percentage of participants reported smoking, but it was associated with a higher prevalence of asthma symptoms. This emphasizes the importance of campaigns to prevent and stop smoking to reduce the prevalence of asthma in this community. In general, the study offers important data on the incidence and severity of asthma symptoms in the children and adolescents. To create efficient interventions to reduce the burden of asthma in this population, additional studies are required to better understand the underlying causes of these symptoms. The results of this study offer important new information on the prevalence and risk factors for nasal problems in children and adolescents with asthma seeking medical care in Mosul, Iraq. The findings of the current study are similar to previous research showing a significant prevalence of nasal problems in people with asthma (Hu et al., 2022; Lehrer et al., 2022). According to the findings, children aged 11 and 14 were more likely to experience nasal problems than children between the ages of 6 and 10 and 15 and 17. This result is consistent with other research that found that nasal symptoms were more common in this age group, presumably as a result of hormonal changes associated with puberty(Afolabi & Rao, 2023; Langan et al., 2023; Reyes-Angel et al., 2022). The severity of nasal problems was not evaluated in this study, which is significant because more research could examine this. The study also discovered that nasal problems were significantly influenced by household income, and people in higher-income households had more severe symptoms. This result is in line with other research (Kaplan & Price, 2020; Licari et al., 2019; Musharrafieh et al., 2020; Sleath et al., 2023), which found that those from higher socioeconomic backgrounds had a higher prevalence of nose problems. Although the causes of this correlation are unclear, it may be linked to environmental elements, including exposure to allergens and pollutants. Smoking has been found to be a key contributory factor to nasal problems in asthmatic children and adolescents. Asthma smokers have been found to have nasal symptoms more frequently in previous studies (Arshad et al., 2020; Booalayan et al., 2020; Wills et al., 2020). Smoking can irritate the nasal passages and aggravate the inflammation of the airways, which can cause nasal congestion and other symptoms. Therefore, to reduce the incidence of nasal problems, healthcare professionals must emphasize the importance of smoking cessation in patients with asthma. According to previous studies (Liu et al., 2022; Togias et al., 2019; Xu et al., 2023), there are no appreciable changes in nasal problems based on family size and previous illnesses. It is crucial to remember that this study did not look at specific disorders or their severity; instead, it only evaluated whether there were chronic diseases. In general, the results of this study emphasize the importance of considering a variety of demographic and lifestyle characteristics when evaluating nasal problems in asthmatic children and adolescents. To reduce the risk of difficulties, healthcare professionals must be aware of the potential effects of income level and smoking on nasal symptoms and should offer appropriate education and interventions. To better understand the severity and effects of nasal problems in this population, more research is required. According to the study findings, the severity of skin problems among children and adolescents with asthma varies according to

their age and socioeconomic position. Compared to adolescents aged 6-10 and 11-15, those aged 15–17 reported having fewer skin problems. According to previous research, younger children with asthma have a higher prevalence of skin conditions (such as eczema) than older children (De Keyser et al., 2021; Guo et al., 2019; Ridolo et al., 2019). These findings are in line with that research. An explanation for this might be that younger children are more susceptible to skin problems because their immune systems and skin barriers are less established. The study also discovered that adolescents with a sufficient economic level had more skin problems than those with a low economic position. This result is unexpected and goes against previous research that found a link between poor socioeconomic position and a higher prevalence of skin problems (Papapostolou & Makris, 2022). However, the cause of this unexpected discovery is unclear, and more studies are required to examine the connection between socioeconomic level and skin problems. The study also discovered that among young people with asthma, smoking had a substantial impact on skin problems. Smoking increases the risk of developing psoriasis, premature skin aging, and poor wound healing(Kamiya et al., 2019; Pezzolo & Naldi, 2019). Smoking has also been shown to make asthma symptoms worse and increase the likelihood that both adults and children develop asthma (Lipa et al., 2021). Since quitting smoking can benefit both respiratory and skin health, it should be a main focus in asthma therapy. In general, the findings of this study shed light on the connection between skin conditions and asthma in young people, highlighting the need for age-, socioeconomic, and smoking-specific treatment strategies for asthma. These results need to be confirmed, and more studies are required to fully understand the intricate interactions between skin problems and asthma in this population. According to the study findings, the severity of skin problems among adolescents with asthma varies with age and socioeconomic level. When comparing adolescents aged 6-10 and 11-15, those aged 15–17 reported having fewer skin issues. According to previous research (Bosma et al. 2021), younger children with asthma have a higher prevalence of skin conditions (such as eczema) than older children. These findings are in line with that research. One explanation for this might be that younger children are more susceptible to skin problems, since their immune systems and skin barriers are less established. The study also discovered that adolescents with enough economic level had more skin problems than those with a low economic position. This result is unexpected and goes against previous research that found a link between poor socioeconomic position and a higher prevalence of skin issues (Gaitanis et al. 2012). However, the cause of this unexpected discovery is unclear, and more studies are required to examine the connection between the socioeconomic level of adolescents with asthma and skin issues. The study also found that among adolescents with asthma, smoking had a substantial impact on skin problems. Smoking has been associated with a number of skin problems, including psoriasis, delayed wound healing, and accelerated skin aging (Morita et al., 2007). Smoking has also been shown to make asthma symptoms worse and increase the likelihood that adults and children can develop asthma (Lang et al. 2019). Since quitting smoking may benefit both respiratory and skin health, it should be a top priority in asthma therapy. Overall, the findings of this study shed light on the connection between skin conditions and asthma in adolescents, highlighting the need for specific age, socioeconomic and smoking-specific management strategies for asthma. These results need to be confirmed and more study is required to fully understand the intricate interactions between skin problems and asthma in this population. The results of this study are consistent with other research, which has shown that younger children have asthma symptoms more frequently and more severely than adolescents and older children (Martin et al., 2022; Triasih et al., 2023). According to Yeh and Schwartzstein (Yeh and

Schwartzstein., 2009), this may be because younger children have smaller airways and weaker respiratory muscles, which can make it more difficult for them to control their asthma symptoms. Younger children's immune systems may also be less developed, which could further increase their vulnerability to asthma (Jain 2020). According to previous research (Trivedi and Denton 2019, Dharmage et al. 2019), there were no significant differences in asthma and allergy symptoms between male and female adolescents with asthma in this study. However, other research has shown contradictory findings, with some indicating that men have a higher frequency of asthma than women (Fuseini and Newcomb 2017, Colombo et al. 2019). Variations in results could be the result of various study populations and techniques. The findings of this study on the relationship between income and asthma prevalence and severity are consistent with previous research (Hancox et al.,, 2004, Chen et al. 2016). According to some research (Sullivan et al. 2020; Pacheco et al. 2014), there may be a link between factors that include poor living conditions, exposure to environmental contaminants, and restricted access to healthcare in lower socioeconomic communities, and increased prevalence and severity of asthma. These results underscore the need for social determinants of health-focused initiatives to reduce the impact of asthma in underserved communities. According to other previous studies (To et al. 2012; Louisias and Phipatanakul 2017), there was no significant correlation between family size and prevalence or severity of asthma in our study. However, other studies have produced contradictory findings, some of which indicate a higher prevalence of asthma in larger families (Kirenga et al. 2019). Variations in results could be the result of various study populations and techniques. According to other previous research (Lin et al. 2011, Lawson et al. 2017), there was no significant correlation between previous illnesses and the prevalence or severity of asthma in our study. However, other studies have shown contradictory findings, some indicating an association between previous respiratory infections and an increased risk of developing asthma (Mohammad and Brough 2019). The variations in results could be the result of various study populations and techniques. The findings regarding the relationship between smoking and asthma prevalence and severity are consistent with previous research (Sturm et al. 2004, Cerveri et al. 2012). According to some research, smoking can make asthma symptoms worse by weakening the lungs and harming the airways (Lin and Li, 2023). These results emphasize the importance of preventing smoking from beginning and encouraging smoking cessation among asthmatic adolescents. The prevalence and severity of nasal problems, skin problems, asthma, and allergy symptoms among children and adolescents with asthma are useful findings of this study. The results, which are consistent with previous research, highlight the need to address social determinants of health and reduce the initiation of smoking to reduce the burden of asthma in communities. Future studies are required to determine the best therapies to address these problems and improve asthma management in children and adolescents. The purpose of the current study was to determine whether certain asthma and allergy symptoms in children and adolescents with asthma are related to different demographic and lifestyle characteristics. The findings show that different age groups experience different levels of severity for particular asthma and allergy symptoms, and younger children experience worse symptoms. This result is in line with other research (Fuhlbrigge et al., 2001; Gupta et al., 2008), which showed that a younger age is a significant risk factor for hospitalization and asthma exacerbations. Contrary to other earlier research (Almqvist et al., 2008; Huang et al., 1999), the current investigation did not discover statistically significant differences in particular asthma and allergy symptoms between male and female adolescents with asthma. However, this result is consistent with recent research that did not show appreciable variations between

genders in the severity of asthma symptoms (Caraballo et al., 2016). The study also looked at how specific asthma and allergy symptoms were affected by economic position, and the findings showed that children and adolescents of wealthier households had symptoms that were more prevalent and severe. This result is in line with earlier studies (Gong et al. 2014; Poyser et al. 2002) that showed a relationship between socioeconomic status and prevalence and severity of asthma. Children of less affluent families may have less access to healthcare care, environmental asthma triggers, or preventive treatments, which could reduce the severity of their symptoms. According to several previous investigations, the study did not detect a significant effect of the occurrence of previous illnesses on certain asthma and allergy symptoms. The results may have been affected by the fact that the current study did not assess the effect of certain comorbidities on the severity of asthma symptoms (Novelli et al.,, 2018; Mahdavian et al. 2018). The last finding was that smoking was a significant risk factor for particular asthma and allergy symptoms in asthmatic adolescents. This finding is consistent with previous studies showing that smoking has a negative impact on the treatment and severity of asthma symptoms. To improve symptom control and general health in adolescents with asthma, it is important to stop smoking (Gilliland et al. 2006; Jones et al. 2016). The present study offers valuable information on the lifestyle and demographic variables that affect particular asthma and allergy symptoms in children and adolescents with asthma. The results point to the need for targeted therapies that improve asthma symptoms control and reduce morbidity in younger children, those of lower socioeconomic backgrounds, and smokers. The study findings show that children and adolescents with asthma from various age groups and socioeconomic backgrounds have variations in the characteristics associated with their current wheezing. In particular, compared to earlier age groups, children aged 6 to 10 years showed more severe variables related to the present wheeze. This result aligns with earlier research (Carroll et al. 2012), which showed that younger age is a significant risk factor for asthma exacerbations. The prevalence and severity of factors related to the present wheeze were also higher in adolescents of a higher socioeconomic class, consistent with the socioeconomic gradient in the prevalence and severity of asthma seen in many countries (Pearce et al., 2007). Interestingly, there was no discernible difference in risk variables for present wheezing among male and female asthmatic adolescents. This result contradicts other earlier studies that suggested a link between the gender of women and more severe asthma(Chowdhury et al., 2021; Hsiao et al., 2019; Zein et al., 2019). It is crucial to note that the current study only looked at variables related to current wheezing; therefore, other asthma symptoms and outcomes can potentially vary between male and female adolescents. It should also be noted that there was no discernible impact of previous diseases or family size on risk variables for the present wheeze. This shows that, at least temporarily, these characteristics may not be substantial risk factors for asthma exacerbations in this cohort. More research is required to fully understand the impact of previous diseases on asthma outcomes. It is crucial to keep in mind that the current study only evaluated the existence of previous diseases, not their severity or duration. The strong impact of smoking on the elements associated with the current wheeze emphasizes the importance of helping adolescents with asthma quit smoking. Healthcare professionals should prioritize smoking cessation programs for adolescents who smoke because smoking is a known risk factor for asthma exacerbations and poor asthma control (National Center for Chronic Disease Prevention and Health Promotion (US) 2014). In general, the study findings offer crucial new understanding of the factors that contribute to asthmatic children and adolescents who sneeze and emphasise the importance of taking into account age and socioeconomic status when addressing asthma management and exacerbations in this demographic.

CONCLUSIONS

This study sheds light on the prevalence and factors associated with allergic asthma (AA) among children and adolescents seeking medical care in Mosul, Iraq. The findings underscore the significant impact of AA on this demographic, with a notable prevalence of skin and nasal problems. Despite the general low severity of asthma symptoms, the study reveals that age, smoking status, and economic status significantly influence the frequency and severity of asthma and allergy symptoms.

RECOMMENDATIONS

Based on the findings of the study, several recommendations are proposed to address the prevalence and severity of allergic asthma in children and adolescents in Mosul, Iraq. Promoting Healthy Lifestyles: Health facilities should advocate for healthy lifestyles, highlighting the importance of physical activity, balanced nutrition, and general well-being to mitigate the risk of allergic asthma. Early diagnosis and treatment: Public awareness campaigns must be initiated to highlight the importance of early diagnosis and timely treatment of allergic asthma. Educating people about asthma causes and triggers can contribute to better management. Routine exams and follow-up care: Health facilities should establish routine examinations and follow-up care for children and adolescents with asthma and allergies. Monitoring your health over time can help identify and address potential complications. Addressing socioeconomic disparities, factors that contribute to the increased prevalence of AA among adolescents of higher socioeconomic backgrounds must be investigated. Initiatives should be implemented to improve air quality, reduce allergen exposure, and create healthier living conditions to address these disparities. Targeted Interventions for Adolescent Smokers: Tailored treatments and interventions must be designed to specifically address the prevalence of asthma and allergies among adolescent smokers. Smoking cessation programs should be prioritized to reduce the overall burden of allergic asthma.

FURTHER RESEARCH

The study emphasizes the need for additional research on the prevalence and incidence of allergic asthma in Iraqi children and adolescents. Future studies can investigate the precise risk factors that contribute to the development of AA and evaluate the effectiveness of interventions to reduce its prevalence and severity.

DECLARATION SECTION

Acknowledgments

Ethical Considerations

Ethical approval was obtained from Iraq on 25 May 2022. The researcher provided a detailed description of the purpose and methodology of the study and submitted it to the Nineveh Health Directorate for approval. Participants were orally informed of the study objectives, ensured voluntary participation, confidentiality, and the right to withdraw at any point without penalty. No names were recorded during data collection to ensure participant confidentiality.

Conflict of interest

None to be declared.

Funding:

None to be declared.

Data availability:

Data are available by contacting the corresponding author by email.

Authors contribution

All authors have read and approved the manuscript.

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