RESEARCH ARTICLE

Some Risk Factors of Asthma in Bronchial Asthma Patient in Sulaimani City- Iraq

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ABSTRACT

Background: Asthma is a chronic heterogeneous disease usually characterized by chronic airflow limitation. The risk factors of asthma include genetic, environmental, host factors and family history. neither sufficient nor necessary for the development of asthma.So the aim of this study to find some risk factors of asthma in asthmatic patients and some worse and trigger factors.

Methodology: A prospective case control study, One hundred patients were participated in the study with diagnosed asthma before 6 month as patient group conducted at asthma and allergy center and another one hundred person were participated with no history of asthma as control group in shar hospital in Suliamani city from June 2021 to September 2021

Result: Both groups were comparable in age and gender .No significant difference between case and control groups regarding marital status, employment (p -value > 0.05).while level of education had a significant relation to asthma patient just 8% of patient had high educational (P-value =0.01).in addition to residency, 86% of patients live in rural area with p=0.00. A significant difference were found between family history and participants, (31%) of cases had family history of asthma with (P-value =0.04.)

Conclusion: This study concludes that level of education, residency, and family history had direct effect on asthma initiation.

Keywords :Risk Factors, Bronchial asthma, case, control, study.
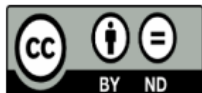
Introduction:

Asthma is a chronic heterogeneous disease usually characterized by chronic airflow limitation. It is defined by the history of respiratory symptoms such as wheeze, shortness of breath, chest tightness, and cough that vary over time and in intensity, together with variable expiratory airflow limitation. Both symptoms and airflow limitation characteristically vary over time and in intensity. These variations are often triggered by factors such as exercise, allergen or irritant exposure, change in weather, or viral respiratory infections (Al-Moamary et al.,2021).

Asthma is one of the most significant non-Communicable Diseases (NCDs) that affecting 1-18% of the population in different countries (GINA, 2019) and is estimated to affect about 339 million people worldwide. It is a cause of substantial burden of disease, including both premature death (kills nearly 1000 people every day) and reduced quality of life, in people of all ages in all parts of the world. Globally, asthma is ranked 16th among the leading causes of years lived with disability and 28th among the leading causes of burden of disease (GAN, 2018).

Furthermore, for most patients, asthma is a disruptive disease, affecting school and work attendance, occupational choices, physical activity, and general quality of life (Hinkle and Cheever, 2018). More than half (55%) of all mortality in Iraq in 2016 was attributable to non-communicable diseases (NCDs). Most NCDs result from poor diet, physical inactivity, tobacco use, and harmful alcohol use leading to metabolic/physical changes, including hypertension, diabetes, and overweight and obesity (Pengpid & Peltzer, 2021).

Some individuals will have stable asthma for weeks or months and then suddenly develop an episode of acute asthma. Different individuals react to various factors in different ways. Most individuals can develop severe exacerbation from a number of triggering agents (Baxi and Phipatanakul, 2010).

Psychological stress may worsen symptoms – it is thought that stress alters the immune system and thus increases the airway inflammatory response to allergens and irritants .Stress may modify the effects of environmental exposures on asthma or asthma morbidity. A recent study in rats

showed that those exposed to both air pollution (concentrated ambient particles) and stress had higher levels of inflammatory markers, white blood cell counts and worse respiratory and lung function than those exposed only to stress or air pollution(Sharpe et al., 2015; Yonas et al.,2012).

Symptoms are usually worse at night and in the early morning or in response to exercise or cold air. Some people with asthma rarely experience symptoms, usually in response to triggers, whereas others may react frequently and readily and experience persistent symptoms (GINA,2019).

Asthma comprises a range of heterogeneous phenotypes that differ in presentation, etiology and pathophysiology. The risk factors for each recognized phenotype of asthma include genetic, environmental and host factors. Although a family history of asthma is common, it is neither sufficient nor necessary for the development of asthma. Furthermore, environmental triggers may affect asthma differently at different times of a person's life, and the relevant risk factors may change over time (Subbarao et al., 2009).so the aim of this study to Find some risk factors of asthma in asthmatic patients and some worse and trigger factors.

Subjects and methods: This is a prospected study was approved by ethical committee/ College of Medicine/ University of Sulaimani and after explained the aim of this study to participants then the questionnaire filled.

Statistical Analysis:

SPSS version 26 statistical software package was used to carry out statistical analysis. Descriptive statistics of the mean standard deviation and standard error was used to examine the data. The Pearson chi-square correlation analysis was used to determine the association between case and control groups. Percentages for independent variables were calculated, and $p<0.05$ was considered statistically significant.

Results: Table (1) shows that the mean age of case and control groups were (51.24±13.11, 49.41±15.29) years old respectively with no significant difference, $(p > 0.05)$.Most of the case and control groups' age ranged between (40-59) years old. More than half of the samples (case and control) groups were male (56%), while, (44%) of the samples were female with no significant difference, $(p > 0.05)$. No significant difference between case and control groups regarding marital status,

employment (p > 0.05).while level education had significant relation to asthma patients just 8% of patients had high educational.in addition to residency, 86% of patients live in rural area with p=0.00.

Table (1) Distribution and association between case and control groups in relation to socio-demographic characteristic.

Variable	Item	Case F (%)	Control F (%)	p-value
Age(years)	<20	3(3.0)	4(4.0)	**0.41**
	20-39	12(12.0)	20(20.0)	
	40-59	60(60.0)	50(50.0)	
	≥60	25(25.0)	25(25.0)	
	Mean±SD	51.24±13.11	49.41±15.29	
Gender	Male	56(56.0)	56(56.0)	**1.0**
	Female	44(44.0)	44(44.0)	
Level of education	Illiterate	22(22.0)	28(28.0)	
	Primary school	48(48.0)	26(26.0)	
	Secondary school	22(22.0)	21(3.0)	
	High education	8(8.0)	25(25.0)	**0.00**
Marital status	Married	89(89.0)	88(88.0)	
	Widowed	6(6.0)	5(5.0)	
	Unmarried	5(5.0)	7(7.0)	**0.70**
Employment status	Governmental employment	19(19.0)	26(26.0)	
	Non-exposure for dust	11(11.0)	16(16.0)	**0.47**
	Exposure for dust	8(8.0)	10(10.0)	
	Non-governmental employment	21(21.0)	26(26.0)	
	Non-exposure for dust	11(11.0)	16(16.0)	
	Exposure for dust	10(10.0)	10(10.0)	
	Student	3(3.0)	4(4.0)	

		Case F(%)	Control F(%)	p-value
	Retired	21(21.0)	15(15.0)	
	Housewife	36(36.0)	29(29.0)	
Residency	Urban	86(86.0)	57(57.0)	**0.00**
	Suburban	13(13.0)	20(20.0)	
	Rural	1(1.0)	23(23.0)	
Total		**100**	**100**	

Table (2) Distribution and association between case and control groups according to family history and history of disease.

Variable	Case F (%) 100	Control F (%) 100	p-value
Family history	31(31.0%)	14(14.0%)	**0.04**
History of diabetic mellitus	12(12.0)	17(17.0)	**0.31**
Duration of diabetic mellitus **1-5 years** **5-10** **>10**	6(6.0) 4(4.0) 2(2.0)	6(6.0) 6(6.0) 5(5.0)	**0.74**

History of hypertension	22(22.0)	23(23.0)	**0.86**
Duration of hypertension **1-5 years** **5-10** **>10**	10(85.0) 6(6.0) 6(6.0)	9(9.0) 9(9.0) 5(5.0)	**0.69**
Total	**100**	**100**	

A significant deference were found between family history and participants, (31%) of cases had family history of asthma with (p=0.04.)No significant deference were found between history of diabetic mellitus and participant (12%, 17%) in case and control groups respectively (p=0.31), also no significant deference were found between duration of diabetic mellitus and participants (p=0.74).regarding history of hypertension, (22%) of cases had history of hypertension with no significant deference compared to control group (23%) p= 0.86, in addition to duration of hypertension. Most of cases and controls had duration of hypertension between 1-5 years (105, 9%) respectively with p=0.69 as show in table (2).

Figure (1) shows that (71%) of asthmatic patients were worse at night and on walking and just 58.0% of asthmatic patient were worse with viral infection like influenza.
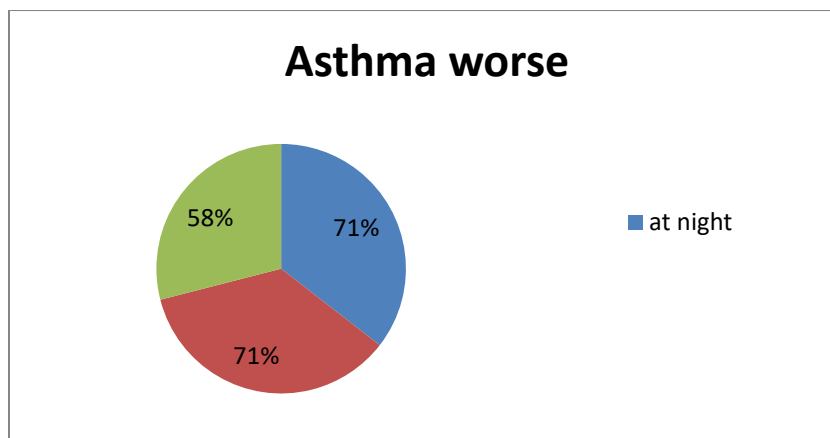

Asthma worse

Figure (1) Frequency of worse factors in asthmatic patients.

Asthma patients triggered by allergy to air pollution (95%) followed by exercise (86%), cold (82%) and last percentage (65%) can be triggered by laughing as show in figure (2).
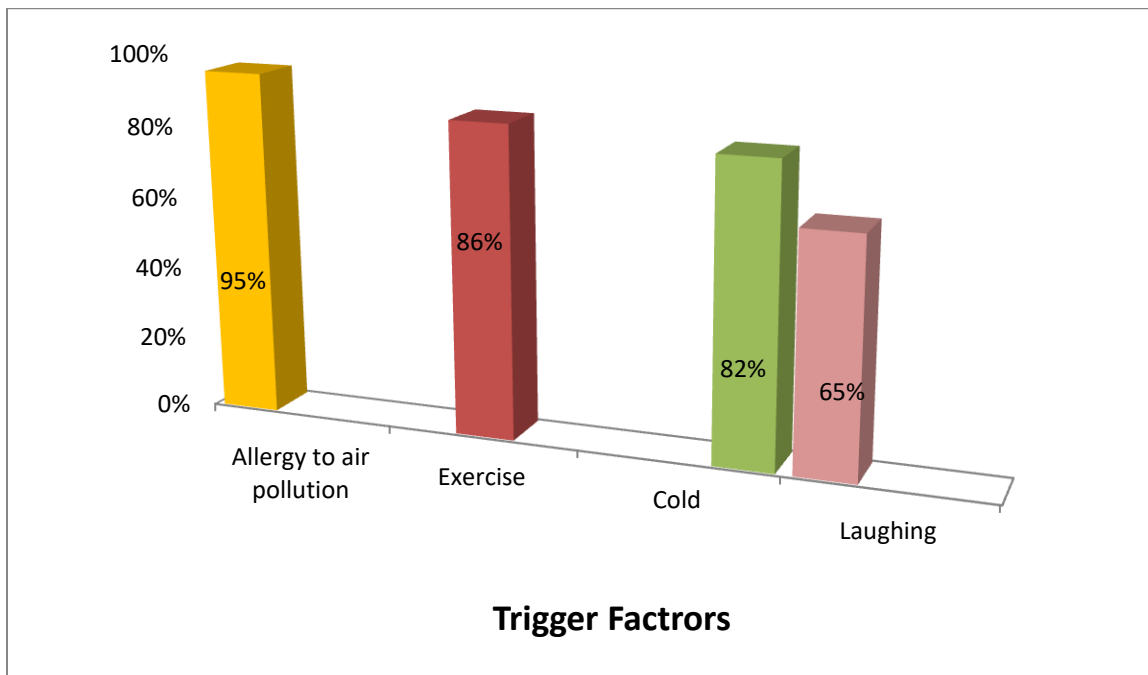

Figure (2) Distributing of trigger factors in asthmatic patients.

Majority of asthmatic patients complained from anxiety and depression (97%, 96%) respectively then followed by 41% of them complained from food allergy, while those with gastro esophageal reflex, rhinitis and chronic rhinosinositis formed just (25%, 23%, 21%) respectively as show in figure (3)
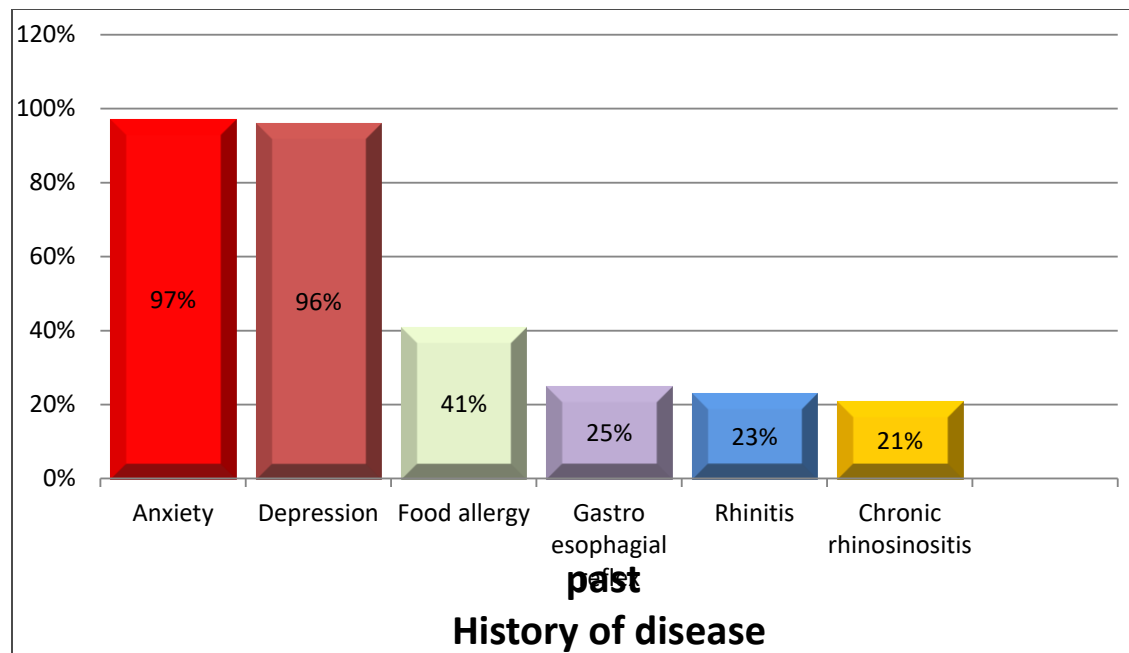
Figure (3) Distribution Past history of disease in asthmatic patients.

As show in figure (4), (64%) of participants had Uncontrolled test , the percentage of partially controlled test were (27%) and just (9%) had controlled test of asthmatic patients
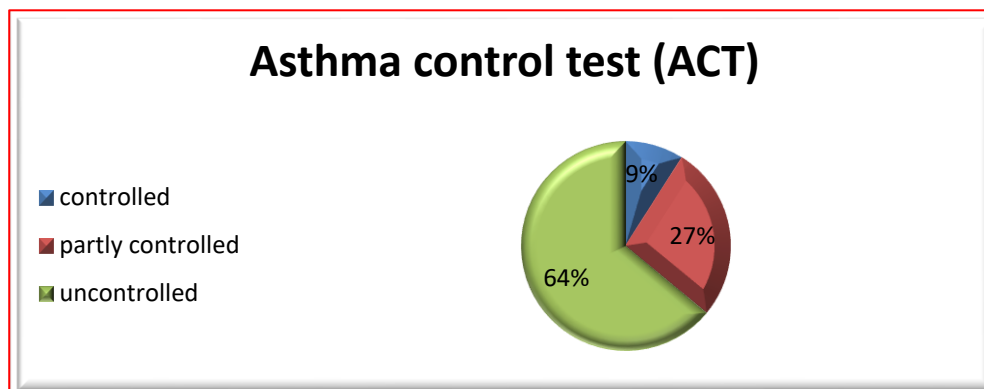

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Figure (4) Frequency of asthma control test (ACT) in asthmatic patients

Table(3) shows no significant association (p > 0.05) were found between asthma control test and history of diagnosed asthma, residency, family history. While a significant association were found between asthma control test and level of education (p=0.04).

Table (3) Association between asthma control test and history of diagnosed asthma, educational level, residency, family history.

variable	items			p-value
History of diagnosed asthma Adult onset asthma Childhood asthma	**ACT** **F (%)**			
	Uncontrolled	**partially controlled**	**Controlled**	
	57(67.1%) 7(46.7%)	22(25.9%) 5(33.3%)	6(7.1%) 3(20.0%)	**0.02**
Residence Urban Suburban	56(65.1%) 8(57.1%)	22(25.6%) 5(38.5%)	8(9.3%) 1(7.7%)	**0.25**
Level of education Illiterate Primary school Secondary school High education	16(72.7%) 30(62.5%) 12(54.5%) 0(0.0%)	5(22.7%) 16(33.3%) 4(18.2%) 2(25.0%)	1(4.5%) 2(4.2%) 6(27.3%) 6(75.5%)	**0.92**
Family history Yes No	23(74.2%) 41(59.4%)	7(22.6%) 20(29.0%)	1(3.2%) 8(11.6%)	**0.87**
Total	**100**			

Table (4) illustrate that no significant association (p > 0.05) were found between history of diagnosed asthma in adult onset, childhood onset and trigger factors of asthma.

Table (4) association between histories of diagnosed asthma and trigger factors in asthmatic patients.

Variable	Items		p-value
Trigger factors of asthma	**History of diagnosed asthma** **N (%)**		
	Adult onset asthma	**Childhood asthma**	**0.33**
	80(84.2%)	15(15.8%)	
1-Allergy to air pollution	56(86.2%)	9(13.8%)	**0.66**

2-Laughter	73(84.9%)	13(15.1%)	**0.93**
3-Exercise **4-Cold air**	68(82.9%)	14(17.1%)	**0.21**
Total	**100**		

Discussion:

In the current study, the highest percentage of age in patient were ranged between (40-59) years old with mean age (51.24±13) years old, these findings in line with the result of study by (Kullowatz et al., 2007), in addition to these findings is controverted by results of study done by (Gorial et al.,2020) in Iraq ,who found that the mean age of asthmatic patients was 41.1 ± 12.7 years.

In the current study the proportion of male were higher than proportion of female, these results agree with other study conducted by (Sumaily et al., 2022) in Saudi Arabia , who illustrated 54.5% were males.in addition to (Elfaki& Shiby, 2017) who found the most of asthmatic patient were male.   Regarding the education level of the participants, higher percentage of high education found in control group than the case group with high significant difference. These finding supported by result of other study conducted by (Ilmarinen et al., 2021) in Northern Sweden who found 35% had primary education, 36% had secondary education, and 29% had tertiary .in addition, this finding is in line with the study carried out in Kurdistan by (Amani et al.,2017) and (Urrutia et al.,2012) in Saudi Arabia, who shows that asthma was more prevalent among illiterate patients. May be due to subjects with a lower educational level had a higher risk of developing asthma and respiratory symptoms.

No significant difference in case and control groups regarding to marital status, the findings consistent with the result of the study done by (Abbas & Amen, 2019 and Sumaily et al.,2022) . Most of the participant in both case and control group were housewife and a few of sample groups were student with no significant difference. These findings is supported by results of study conducted by (AL-Banna & Hassan 2009) in Sulaimani city, who found 80(46.2%) of participant were housewives, 79 (45.6% were employed, 7(4.1%) were students, and 7 (4.1%) unemployed with significant difference between male and females.in addition to this finding is in line with those of the study carried out by (Kalmarzi et al.,2018) IN Iran who found that 45% (n=221) were housewives and 44% had elementary and secondary levels of education and to 15.0% of them had a university education. this may be due to that they deal with chemicals and irritants for a long period of time.

Majority sample in case and control group were from urban, and the rest of sample were from suburban and rural. This finding is in agreement with those of the studies carried out by (El-Shazly et al.,2006: Douwes et al.,2007 Ali et al. 2019; Alsaimary & Mezban, 2021).) who pointed out that asthma is more prevalent among urban residents because of westernized lifestyles and exposure to more vehicle emissions.

In the current study asthmatic patients have a greater ratio of positive relatives than non-asthmatics. These results were agreed with other result done by (Barwary& Mahmood, Xia et al., 2021, and London et al.,2001) .May be due to family history related to genetic factor. Regarding history of diabetic only a few of the sample in case and control group had diabetic mellitus and duration of diabetic mellitus, 1-2 years had high percentage in case and control group, these findings were consistent with the result of a study conducted by (Sumaily et al., 2022, and Zhang et al., 2021) who illustrate that 78.8% of patients without hypertension also about 87.5% of patients without diabetes. No significant relation between diabetic mellitus and asthmatic patient

also no significant differences were found between hypertension and asthmatic patient.

Regarding the percentage of night and on walking asthma worse were equal and more than half the percentage of asthmatic patient worse with viral infection like influenza. Most of the asthmatic patient triggered by allergy to air pollution followed by exercise, cold, laughter. These findings were agrees with a result of study done by (Seys et al.,2013;Hamdan et al., 2019) in Iraq, who found that majority of asthmatics were complaining from dust as a triggering factor for asthmatic exacerbations. Due to cold air can lead to dryness in the airways, the tightness and impair the normal function of the airways to clear inhaled substance.

Regarding past history of disease, most of the asthmatic patient had anxiety and depression, these study supported by results those of study conducted by (Bedolla-Barajas et al.,2021) in Latin America , who found anxiety present in 54.3% of patients, while depression was found in 50.6%,Then followed by food allergy, rhinitis, gastro esophageal reflux and chronic rhinosinositis. These findings agree with other study done by

(Muhammed et al., 2012;Derbak,2017;Akyuz& Mutluay,2017;Tomisa et al., 2019). Due to Inhalation of gastric acidity can trigger a bronchial hyper-responsiveness and can lead an asthmatic attack.

Regarding to asthma control test, the most of asthmatic patient were uncontrolled, the promotion of partially controlled nearly was one third and a few of them were controlled. These findings agree with the result of study conducted by (El Margoushy et al., 2016) who illustrated that only 24% of patients were controlled, 90% of them were controlled. 76 % of patients were considered uncontrolled. This is may be explained lower asthma controlled with high incidence of dyspnea and hyperventilation.

In the present study, no significant association were found between asthma control test and family history, These result agree with the result of the study done by (Almomani et al.,2019). Regarding level of education significant association were found between asthma control test and level of education, these findings agree with the result done by (Peters et al.,2007) who found Patients with uncontrolled asthma were less educated. Because those high degree of education had more information about health and management of disease.

Regarding association between histories of diagnosed asthma and trigger factors in asthmatic patients, there were no significant association were found between histories of diagnosed asthma and trigger factors. These result agree with the result of the study done by (Honkamaki et al.,2019; Wright, 2011).

Conclusions: This study concludes that level of education, residency, and family history had direct effect on asthma initiation. Also asthma worse at night, on walking, with viral impact like influenza and triggered by allergy to air pollution, exercise, cold air, laughing. Anxiety and depression more prevalence in asthmatic patients. Patient with low level of educational had uncontrolled ACT test.

References:

Ali KM, Amin AF, and Muhammed A K (2019). An investigation into the effect of cigarette smoking on the severity and control of asthma in adults in Sulaimani City. *Revista Latinoamericana de Hipertensión*, *14*(6), 675-681.

AL-Banna H I. B and Hassan HM. S (2009). Risk Factors, Quality of Life and Management of Asthmatic Adults Attending Asthma and Allergy Center in Sulaimani City. *IRAQI JOURNALOF COMMUNITY MEDICINE*, *22*(3).

Abbas N Q,and Amen M R. (2019). Knowledge on Self-Management and Level of Asthma Control among Adult Asthmatic Patients Attending Kalar General Hospital. *Journal of Garmian University*, *6*(3), 310-319.

Alsaimary I E ,and Mezban F H. (2021). The Estimation of risk factors affecting patients associated with bronchial asthma in Basrah, southern Iraq: Case-control observational study. *Journal of Medical Research and Health Sciences*, *4*(1), 1146-1150.

Al-Moamary, Mohamed S et al. "The Saudi Initiative for Asthma - 2021 Update: Guidelines for the diagnosis and management of asthma in adults and children." *Annals of thoracic medicine* vol. 16,1(2021):456.

Almomani BA, Al-Eitan LN, Al-Sawalha NA, Samrah SM, and Al-Quasmi MN. (2019). Association of genetic variants with level of asthma control in the Arab population. *Journal of asthma and allergy*, *12*, 35–42. https://doi.org/10.2147/JAA.S186252

Amani S, Rahmani K, Ghaderi E, Bidarpour F, Rahimzadeh A and Rasaeian S (2017). Prevalence of non-communicable diseases risk factors among the population of rural areas of Kurdistan Province, in Iran: a population-based study by rapid assessment method in 2015. *Scientific Journal of Kurdistan University of Medical Sciences*, *22*(4), 101-110.

Barwary NJ. and Mahmood S (2021). Identifying the Association of Advanced Glycation End–Product with Asthma in the Iraqi Kurdish Population. *Annals of the Romanian Society for Cell Biology*, *25*(6), 8762-8773.

Akyuz F and Mutluay O (Which diseases are risk factors for gastroesophageal reflux) at Turk J Gastroenterol 2017 Dec;28 (suppl 1):S44-S47

Baxi SN and Phipatanakul W, (2010). The role of allergen exposure and avoidance in asthma. *Adolescent medicine: state of the art reviews*, *21*(1), 57–ix.

Bedolla-Barajas M,Morales-Romero J,Fonseca-López, JC, Pulido-Guillén NA, Larenas-Linnemann D and Hernández-Colín DD (2021). Anxiety and depression in adult patients with asthma: the role of asthma control, obesity and allergic sensitization. *Journal of Asthma*, *58*(8), 1058-1066.

Derbak M et al (Combined course of Bronchial asthma and gastroesophageal reflux) at Georgian med news 2017 Nov; (272): 69-74,

Elfaki N K, and Shiby AY. (2017). Risk factors associated with asthma among Saudi adults in Najran. *J Clin Respir Dis Care*, *3*(133), 2472-1247.

El-Shazly AM, El-Beshbishi SN, Azab MS, El-Nahas HA, Soliman ME, Fouad MA, Mel-S M (2006) Present situation of house dust mites in Dakahlia Governorate, Egypt. J Egypt SocParasitol 36:113–126. 36

El Margoushy N, Alkhald S M, Al Khaldi, NZ and El Nashar N (2016). Assessment of Asthma Control in a Sample of Asthmatic Patientsin Taif City, Saudi Arabia. *The Egyptian Journal of Hospital* Medicine, *62*(1), 1-8.

GAN. (2018, May 6). The Global Asthma Report. Retrieved July 5, 2019,

from Global Asthma Network.

GINA. (2019). A Pocket Guide for Health Professionals. Retrieved August 6,2019, from Global Initiative for Asthma.

Gorial FI, Allawerdi MA and Abd Ali MN (2020). Fibromyalgia in Iraqi patients with asthma and its impact on asthma severity and control. *Annals of medicine*

Hinkle JL and Cheever KH (2018). *Brunner and Suddarth's textbook of medical-surgical nursing*. (4th ed,.vol 2 p.453) Wolters kluwer india Pvt Ltd.

Hamdan SJ, Al-Attar Z, and Hashim I. (2019). Prevalence of Montelukast Use as an Add-On Therapy among Iraqi Asthmatics on Treatment Attending Al-Kindy Teaching Hospital and Al-Zahraa Center of Asthma and Allergy. *Open access Macedonian journal of medical sciences*, *7*(14), 2246–2250.

Ilmarinen P, Stridsman C, Bashir M, Tuomisto LE, Vähätalo I, Goksör E, and Wennergren, G. (2021). Level of education and asthma control in adult-onset asthma. *Journal of Asthma*, 1-20.

London SJ, James Gauderman W, Avol E, Rappaport EB, and Peters JM. (2001). Family history and the risk of early-onset persistent, early-onset transient, and late-onset asthma. *Epidemiology (Cambridge, Mass.)*, *12*(5), 577–583

Kalmarzi RN, Ataee M, Ghaderi E, Nili S, Ataee, P, Kooti Wand Kavyani, Z. (2018). The Prevalence of Asthma and Related Risk Factors in 20-44 Years Old Population in the Kurdistan Provine-Iran, 2014-2015. *J Pharm Res Int*, *22*(3), 1-7.

Kullowatz A, Kanniess F, Dahme B, Magnussen H, and Ritz T. (2007). Association of depression and anxiety with health care use and quality of life in asthma

patients. *Respiratory medicine*, *101*(3), 638-644.

Muhammed SM, Sultan K, and Y Abdulrazaq M. (2012). Asthma in adults; epidemiology, risk factor and patterns of presentation: a cross sectional, questionnaire based study in Baghdad Teaching. *Kerbala Journal of Medicine*, *5*(11), 1255-1261.

Pengpid S and Peltzer K (2021). Overweight and Obesity among Adults in Iraq: Prevalence and Correlates from a National Survey in 2015. *International journal of environmental research and public health*, *18*(8), 4198.

Seys SF, Daenen M, Dilissen E, Van Thienen R, Bullens DM, Hespel P, and Dupont, L. J. (2013). Effects of high altitude and cold air exposure on airway inflammation in patients with asthma. *Thorax*, *68*(10), 906-913.

Subbarao P, Mandhane PJ and Sears MR (2009). Asthma: epidemiology, etiology and risk factors. *CMAJ : Canadian Medical Association journal = journal de l'Association medicale canadienne*, *181*(9), E181–E190.

Sharpe RA, Bearman N, Thornton CR, Husk K and Osborne NJ. (2015). Indoor fungal diversity and asthma: a meta-analysis and systematic review of risk factors. *Journal of*

Allergy and Clinical Immunology, *135*(1), 110-122.

Sumaily MA, Tayel S and Noureldin EM (2022). The Prevalence of Depression among Adult Asthmatic Patients in Jizan Region, Saudi Arabia. *The Egyptian Journal of Hospital Medicine*, *86*(1), 156-164.

Tomisa G, Horváth A, Szalai Z, Müller V and Tamási L (2019). Prevalence and impact of risk factors for poor asthma outcomes in a large, specialist-managed patient cohort: a real-life study. *Journal of asthma and allergy*, *12*, 297–307.

Urrutia I, Aguirre U, Pascual S, Esteban C, Ballaz A, Arrizubieta I,and Larrea I. (2012). Impact of anxiety and depression on disease control and quality of life in asthma patients. *Journal of Asthma*, *49*(2), 201-208.

Wright RJ , Fay M E, Suglia S F, Clark C J, Evans JS, Dockery DW, and Behbehani J. (2010). War-related stressors are associated with asthma risk among older Kuwaitis following the 1990 Iraqi invasion and occupation. *Journal of Epidemiology & Community Health*, *64*(7), 630-635.

XIA MM, JIANG YG, and GUO XQ. (2021). Prevalence and risk factors of asthma among adults in Songjiang District of Shanghai: a cross-sectional study. *Shanghai Journal of Preventive Medicine*, 995-1000.

Yonasn MA, Lange NE,and Celedón JC. (2012). Psychosocial stress and asthma morbidity. *Current opinion in allergy and clinical immunology*, *12*(2), 202–210.

Zhang P, Lopez R, Attaway AH. Georas SN, Khatri SB, Abi-Saleh S, and Zein JG. (2021). Diabetes mellitus is associated with worse outcome in patients hospitalized for asthma. *The Journal of Allergy and Clinical Immunology: In Practice*, *9*(4), 1562-1569