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Investigate Patients' knowledge with Bronchial Asthma about Risk Factors and Triggers: Suggested Nursing Instructions

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Abstract
Background: The most common chronic respiratory tract diseases is bronchial asthma. **Aim:** Investigate Patients' knowledge with Bronchial Asthma about Risk Factors and Triggers. **Research design:** A descriptive research design was utilized to conduct the aim of this study. **Subjects:** A convenience sample included all admitted patients for chest department at Luxor fever hospital; total number of subjects was hundred fifty- two adult male and female patients; their ages ranged between_18 to 65 years. **Setting:** This study was conducted in the chest diseases department and outpatient clinic of patient admitted to Luxor fever Hospital, Egypt. **Tool:** Structured interview questionnaire included demographic, medical data, Risk factors and triggers of bronchial asthma Assessment Sheet. **Results:** Majority of the risk factors and triggers of patients with bronchial asthma include: family history of predisposing factors (B = .192, p = .007), occupational hazards (B = .204, p = .023), active smoking (B = .490, p < .001) and exposure to irritating factors such as cleaning chemicals (B = .138, p = .001). **Conclusion:** The risk factors and triggers of patients with bronchial asthma include: Outdoor air pollution, Active smoking, occupational hazards, Family history of predisposing factors for bronchial asthma, exposure to an irritating factor, such as chemicals used in cleaning. **Recommendation:** Educational booklet to provide patients with the needed instructions and knowledge about risk factors and triggers of bronchial asthma .

Keywords: Bronchial asthma, Instructions, Patient knowledge, Risk factor & Triggers.

Introduction
Bronchial asthma, a chronic inflammatory disease of the respiratory passages, can be brought under control with medication. It is typically accompanied by an organic hyper-reaction to direct or indirect stimuli. Wheezing, paroxysmal dyspnea, a tightness in the chest, coughing, or an increase in expiratory time are some of the symptoms that define this pathology, and their severity can change over time. **(Fernández-Francos et al., 2021).**

More than 339 million people worldwide suffer from asthma, according to a recent World Health Organization (WHO) report. By 2025, experts estimate that there will be 400 million people with asthma. **(Zewdie et al., 2024).**

Adult asthma prevalence is 3.8% per 1000 at-risk persons. Asthma is regarded by the WHO as a serious medical condition. Although asthma can strike anyone at any age, it most frequently affects children and young people. Although there have been some reported minor variations in incidence between males and females, both sexes are impacted nearly equally. Despite the fact that asthma cannot be "cured," clinical episodes can be significantly avoided and managed with appropriate care. **(Medeleanu et al., 2024).**

Four primary mechanisms contribute to airway blockage in bronchial asthma: i) bronchial smooth muscle contraction; ii) airway wall edema; iii) mucous plugging of the bronchioles; and iv) irreversible lung alterations. **(Hanusrichterova et al., 2024).**

Asthma is a complicated, multifaceted condition, according to the available data, and its etiology is increasingly being linked to interactions between environmental exposures, host variables, and genetic susceptibility. These comprise environmental variables (pollens, mold and other aeroallergens, weather, and air pollution), host factors (nutritional factors, infections, obesity, and allergic sensitization), and genetic factors (genes that are susceptible to asthma). Although the exact causes of asthma are still unknown, several potential causes include inflammation of the airways and regulation of airway tone and reactivity. **(Hernandez-Pacheco et al., 2022).**

Inhaled substances and particles that may cause allergic reactions or irritate the airway, such as indoor allergens (like house dust mites in bedding, carpets, and stuffed furniture pollution, and pet dander) and outdoor allergens (like pollens, tobacco smoke, chemical irritants in the workplace, and air pollution),

combined with genetic predisposition, are what trigger asthma attacks. **(Wang et al., 2023).**

In the primary care and hospital settings, nurses play a vital role in the assessment and observation of patients with bronchial asthma, including asthma education. They also play a critical role in the early identification and management of these patients and gather data on how their asthma impacts their daily activities and sense of self. **(Yousif et al., 2020).**

In addition to suggesting nursing recommendations for patients with bronchial asthma, nurses are essential in-patient education regarding health care. Nurses have a crucial role in patient health education to lower risk factors and triggers and in the asthma control chain loop. Diet, exercise, lifestyle, medication, medical equipment, and preventing asthma attacks are all covered in the patient's education. Patient health education techniques include follow-up, home visits, phone calls, text messages, videos, posters, spoken instruction, and demonstrations. **(Rukahu, et al., 2021).**

Significance of study

The prevalence of asthma in Egypt is 6.7**% (Tarraf et al., 2018)**. In Luxor fever hospital, according to the patient record Luxor fever hospital, the number of patients with bronchial asthma who admission to an inpatient unit during the period of 1/1 / 2022 to 31 / 12 / 2022 was (60) patient, Number of patient with bronchial asthma who admission to the outpatient unit during the period of 1/1 / 2022 to 31 / 12 / 2022 was (150) patient. This incidence is an indicator for searching about the risk factors and triggers of bronchial asthma as well as suggesting nursing instructions for asthmatic patients to minimize these triggers.

Investigate Patients' knowledge with Bronchial Asthma about Risk Factors and Triggers Through the following objectives:

1- Design suggested nursing instructions for patients with bronchial asthma.

2 -Providing nursing instructions for patients with bronchial asthma.

Patients and Method

Research design:

A descriptive research design was utilized to conduct the aim of this study.

Setting:

This study was conducted in the chest diseases department and outpatient clinic of patient admitted to Luxor fever Hospital.

Subjects:

A convenience sample included all admitted patients for chest department at Luxor fever hospital; total number of subjects was hundred fifty- two .

Research question:

what is Patients' knowledge with Bronchial Asthma about Risk Factors and Triggers?

Duration of data collection: Collecting data lasted six months from December 2023 to May 2024.

Tools of the study: Two tools were utilized in this study:

Tool structured interview questionnaire:

This tool was created by the researcher according to the available literature review. It consisted of two parts:

Part (1): Demographic Data: Such as (age, gender, marital status, level of education, residence, occupation.

Part (2): Medical Data: it was including present and past history, previous surgery, family history and chronic diseases and diagnostic studies .

Tool (2): Risk factors and triggers of bronchial asthma Assessment Sheet:

Risk factors: Such as (age, sex, race, air pollution, cigarette smoke, financial status, concentration of allergens, Indoor and outdoor allergens, such as cockroaches, furry animals, fungi, and molds.

Trigger: Such as (house dust mite, pollen, fungal spore, exercise, food, drinks, drugs, carpets and stuffed furniture pollution, pet dander, tobacco smoke, chemical irritants in the workplace. **(Wang et al., 2023), (Hernandez-Pacheco et al., 2022).**

Scoring system:

If the question is answered correct, it was scored 1, while incorrect answer was scored zero. The total score was graded as: ≥60% is satisfactory, while <60% is unsatisfactory **(Abass et al., 2024) .**

The patient's knowledge regarding bronchial asthma included 45 questions. (8) multiple-choice questions about the definition, patient complain, causes, complications, laboratory investigations, medication, management. (10) True Or False questions about the patient's knowledge about bronchial asthma. (10) multiple-choice questions regarding the patient's knowledge about Risk factors and triggers of bronchial asthma; and (17) True or False questions regarding the patient's knowledge about Risk factors and triggers of bronchial asthma. Scores assigned to each item were between 1 and 0 points, as follows: (correct=1, incorrect=0) Accordingly, a range of total scores lies between 0 and 38. Patients' knowledge was classified as:

Satisfactory knowledge: ≥60%.

Unsatisfactory knowledge: <60%.

Total score of knowledge (0-16 marks)

Total score of risk factors (0-22 marks)

Total score of knowledge and risk factors (0-38 marks).

Comprehensive nursing care:

Nursing instructions :

It was developed by the researcher based on the literature review **(WHO, 2020), (Fernández-Francos et al., 2021**), (**Abd El-Wahab et al., 2016), (Rukahu, et al., 2021), (Ghozali & Urrohmah et al., 2023).** It was included:

-Definition of bronchial asthma.

-Signs and symptoms of bronchial asthma.

-Risk factors and triggers of bronchial asthma.

-Complications of bronchial asthma.

-Avoiding of risk factors and triggers, treatment, daily living activities, follow up visits, exercise, lifestyle, medicine, medical devices, and asthma attack prevention.

procedures for data collection:

This study was carried out in two phases

I: Assessment and planning phase:

Tool development

Data gathering tool were created by reviewing literature from the past, present, and worldwide in a variety of contexts through the use of books, articles, journals, magazines.

Content validity and reliability:

The tools were given to a panel of five experts in the field of medical surgical staff to examine content validity. No modifications of the content were be done according to the panel judgment on the clarity of sentences, appropriateness of the content, and sequence of items .

Test **reliability** of the tools was confirmed by using the alpha Cronbach's test to check the stability of the internal consistency of instruments was (85).

Pilot study:

It was carried out on 10% of the study participants (15 patients) to assess the tools' applicability and simplicity. The data from the pilot study were assessed; no modifications were done to the tools, hence the study incorporated 10% of the pilot study in the total sample .

Ethical considerations

The Faculty of Nursing ethical committee approved the conduct of this study.in November 2023, number (1120230675). An official permission was taken from the Head of the Chest Department in order to collect the appropriate data. After discussing the nature and aim of the study, patients provided an oral consent to participate in the study. The study participants were not at risk during the research's application. Confidentiality and anonymity were ensured. The study participants had the right to reject to participate in the trial and/or withdraw without explanation at any time.

Implementation phase:

- The researcher began data collection after obtaining approval to proceed with the study.
- Data was collected in a single meeting with each patient from Saturday to Wednesday between 8 a.m. and 8 p.m., during morning and afternoon shifts .
- The researcher interviewed patient individually to collect the required data using interview questionnaire. The time spent filling out the questionnaire ranged from 10 to 15 minutes.
- During the interview, the researcher introduced herself, gave a brief introduction, explained the study's goal, and gained oral consent from patient to participate voluntarily. Furthermore, the researcher completed the tool and took care to simplify the questions so that they were understandable to patients. Additionally, the researchers provided explanations whenever questions arose.
- After completion the questionnaire from the patients. The researcher gave the information which the patients need regarding definition of bronchial asthma, Risk factors and triggers, signs and symptoms, causes, complication, treatment, diet, avoiding of risk factors and triggers, treatment, daily living activities, follow up visits .
- An educational booklet was utilized to provide patients with the information and instructions they required regarding Risk factors and triggers of bronchial asthma. A researcher who visited the chosen environment and asked patients to participate in the study.
- To find out how much each patient knew about Risk factors and triggers of bronchial asthma, the researcher interviewed each patient and asked them to complete a standardized questionnaire .
- The researcher was assessing patient demographics and medical data on patient admission. Also, patient knowledge regarding Risk factors and triggers of bronchial asthma was assessed.

Statistical analysis:

The SPSS version 23 statistical software application was used to evaluate, code, analyze, and tabulate data. Frequencies and percentages were used as descriptive data. Qualitative data were reported as numbers and percentages (n, %). The mean and standard deviation (SD) of quantitative data were used. To analyze the association between two or more qualitative variables, the Chi square ($\chi 2$) test, correlation Coefficients was utilized and Regression test to detect important risk factors. P-value$\leq$ 0.05 was establish ed as the significant level.

Results:

Table(1): Distribution of demographic data among patient participant n= 152

Variables	N	%
Age		
30-<30yrs	32	21.1
30-<45yrs	42	27.6
45-<60 yrs	38	25.0
More than 65	40	26.3
Gender		
Male	85	55.9
Female	67	44.1
Marital status		
Single	45	29.6
Married	73	48.0
Divorced	7	4.6
Widow	27	17.8
Level of education		
Illiterate	42	27.6
Read and write	34	22.4
Secondary school	37	24.3
High education	39	25.7
Occupation		
Intellectual work	9	5.9
Manual work	143	94.1
Residence		
Urban	65	42.8
Rural	87	57.2

Medical data

Table (2):Distribution of medical data among patient participant n= 152

Variables	N	%
Chronic disease		
Hypertension	57	37.5
Diabetes Mellitus	63	41.4
Renal disease	10	6,6
Chest disease	144	94.7
Others	5	3.3
Previous surgery	82	53.9
Family history of bronchial asthma	95	62.5
Diagnostic studies		
Chest x-ray	151	99.3
Blood test	145	95.4
Allergy test	37	24.3
Lung function test	78	51.3
Others	9	5.9

Table (3): Mean score of total Knowledge about Risk factors and triggers of bronchial asthma among patient participant n= 152

Variables	Minimum	Maximum	Mean	Std. Deviation
Knowledge about disease	3.00	14.00	9.4539	2.06465
Knowledge about risk factors and triggers	5.00	17.00	11.3158	2.34004
Total knowledge	11.00	28.00	20.7697	3.57414

Table (4): Relation between total Knowledge and demographic data n= 152

Variables	Unsatisfactory ≤ 60%		Satisfactory ≥ 60%		X2 (p.value)
	N	%	N	%	
Age					
30-<30yrs	19	12.5	13	8.6	7.665 P=.053
30-<45yrs	29	19.1	13	8.6	
45-<60 yrs	26	17.1	12	7.9	
More than 65		23	5	3,3	
Gender					
Male	65	42.8	20	13.2	2.154 P=.152
Female	44	28,9	23	15,1	
Marital status					
Single	29	19.1	16	10,5	8.409 **P=.038**
Married	49	32.2	24	15.8	
Divorced	6	3.9	1	0.7	
Widow	25	16,4	2	1,3	
Level of education					
Illiterate	39	25.7	3	2.0	21.835 **P=.000**
Read and write	28	18.4	6	3.9	
Secondary school	19	12.5	18	11.8	
High education	23	15,1	16	10,5	
Occupation					
Intellectual work	6	3.9	3	2.0	.120 P=.713
Manual work	103	67,8	43	28,3	
Residence					
Urban	37	24.3	28	18.4	12.241 **P=.001**
Rural	72	47,4	15	9.9	

Chi-Square Tests **=Significant difference *p≤0.05*
***= highly significance* **p≤0.01* *Ns= Non significant difference P>0.05*

Table (5): Predictors of risk factors and triggers among participant n=152

Variables	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	5.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
Family history of predisposing factors for bronchial asthma	.192	.071	.038	2.718	**.007**	.052	.332
Occupational hazards lead to asthma	.204	.089	.033	2.300	.023	.029	.379
Active smoking is considered risk factor for developing asthma	.490	.048	.480	10.235	**.000**	.395	.585
Air pollution and car exhausts is not considered a risk factor for asthma	.001	.024	.001	.032	.974	-.047-	.048
The use of chemicals in hair styling is a risk factor for asthma	.099	.041	.095	2.399	**.018**	.017	.181
Exposure to an irritating factor, such as chemicals used in cleaning is a risk factor for asthma	.138	.042	.132	3.253	**.001**	.054	.222
Stress and anxiety are among the most important risk factors for asthma	.097	.039	.091	2.510	**.013**	.021	.173
Premature birth is also a risk factor for developing asthma	.130	.032	.120	4.058	**.000**	.067	.193
Activities that make you breathe harder cannot triggers an asthma attack	-.042-	.027	-.035-	-1.592-	.114	-.095-	.010
Dust mites are microscopic bugs that cannot trigger an asthma attack	-.065-	.030	-.055-	-2.164-	**.032**	-.124-	-.006-
Outdoor air pollution can trigger an asthma attack	.152	.035	.140	4.391	**.000**	.084	.221

Table (1): This table reveals that 27.6% of the studied patients were aged 31 to 45 years, and 55.9% of them were male. Regarding marital status, 48% were married. In terms of education level, 25.7% had a higher education. Additionally, 94.1% of the patients were engaged in manual work. Finally, 57.2% of the patients resided in rural areas.

Table (2): Provides a detailed distribution of medical data among the studied patients. Among the chronic diseases, chest disease is the most prevalent, affecting 94.7% of participants, followed by diabetes mellitus (41.4%) and hypertension (37.5%). Only a small percentage of participants reported renal disease (6.6%) or other unspecified conditions (3.3%). Additionally, 53.9% of the patients had undergone previous surgery, while 62.5% had family history of bronchial asthma. Regarding diagnostic studies, chest x-rays were the most commonly performed (99.3%), followed by blood tests (95.4%), lung function tests (51.3%), and allergy tests (24.3%).

Table (3): Provides the mean scores for total knowledge about risk factors and triggers of bronchial asthma among 152 patient participants. The mean score for knowledge about the disease was 9.45 ± 2.06, with a minimum score of 3.00 and a maximum of 14.00. For knowledge about risk factors, the mean score was slightly higher at 11.32 ± 2.34, with a range from 5.00 to 17.00. The total knowledge score had a mean of 20.77 ± 3.57, with scores ranging between 11.00 and 28.00

Table (4): Examines the relationship between total knowledge about bronchial asthma and demographic variables among 152 patient participants. Significant associations were found for marital status (X^2 = 8.409, p = .038), level of education (X^2 = 21.835, p < .001), and residence (X^2 = 12.241, p = .001). Participants with higher education and those residing in urban areas had better knowledge scores. Marital status also influenced knowledge, with widowed participants displaying lower scores. Age (p = .053), gender (p = .152), and occupation (p = .713) were not significantly associated with knowledge levels.

Table (5): This table represents the predictors of risk factors and triggers for bronchial asthma among 152 participants based on regression analysis. The model is statistically significant (F = 710.345, p < .001), indicating a strong relationship between the variables and risk factors. Significant predictors include family history of predisposing factors (B = .192, p = .007), active smoking (B = .490, p < .001, outdoor air pollution (B = .152, p < .001), and premature birth (B = .130, p < .001), occupational hazards (B = .204, p = .023).

Discussion

Asthma is a serious illness that affects people of all ages worldwide. This long-term condition affects the airways that allow air to enter and exit the lungs. These irritated airways in asthmatics are extremely sensitive and frequently react to allergens or irritants. Although there is no cure for asthma, with the right diagnosis, treatment, and strategy, symptoms can be managed **(Ahmed et al., 2024).**

Nursing interventions are effective in reducing asthma related emergencies, the frequency of acute asthma attacks, hospital admission, and improving quality of life among asthma patients **(Tao et al., 2023).** Nurse can support asthmatic patients from the beginning of diagnosis for teaching them coping strategies and increasing their self-efficacy **(Karaarslan &Başbakkal, 2023).**

Therefore, the present study was conducted to investigate the risk factors and triggers of patients with bronchial asthma. Design suggested nursing instructions for patients with bronchial asthma.

Regarding the -demographic characteristics of the studied patients, the current study revealed that more than one quarter of the studied patients were aged 31 to 45 years. This finding was in accordance with **Elsadee et al., (2023)** Who revealed that more than one-third of them ranged between 30- <40 years with a mean value (of 31.5±7.41). This result isn't in agreement with **Ibrahim et al., (2019)** who reported that more than half of the studied were among the age group of 40-60 years.

As regard gender, the current study revealed that more than half of studied patient were male. These results comply with the study conducted by **Ścibor& Malinowska-Cieślik, (2020)** who concluded that more than half of the studied sample were male. Moreover, this result agreed with **Dawood et al., (2019)** who reported that half of their studied participant were males.

These results disagreed with the study conducted by **Adachi et al., (2019)** who found that less than two thirds of the studied patient were female. But these results disagreed with **Nafie et al., (2017)** who found that majority of studied patients were females.

Regarding marital status, around half were married. This result agreed with **Mohammed et al., (2020)** who reported that more than half of their studied participant married.

As regard patients' educational level, the present result indicated that, more than one quarter had a higher education. These findings were agreed with **Elbur & Alharthi (2017)** who stated that, more than half of patients with bronchial asthma had high level of education. But, **Mohammed et al., (2020)** disagreed with these results who found that about half of studied patients were read and write and had

university level of education. Also, these findings were contradicted with **Abo El-Fadl &Sheta, (2019)**, who stated that, more than two thirds of patients with bronchial asthma were illiterate.

As regard Occupation, most of the patients were engaged in manual work, this result correlated with the nature of the rural areas. This result in the same line with Ahmed **et al., (2024)** who concluded that more than one third of them had manual work. Also, in the same hand **Mohammed et al., (2020)** who concluded that the highest percentage of the study sample were farmers. While, this result opposite with **Mohamed et al., (2022)** who showed that more than half of the studied patients were not working.

Concerning to residence, the study findings showed that around two third of the patients resided in rural areas. This result matched with the results of the study conducted by **Yousef et al., (2021)** who found that, more than two thirds of the studied sample were from rural areas. In addition, this result agreed with **Amin et al., (2019)** who showed that three quarters of their sample were from rural areas.

Also, these results are supported by **Bayomi, (2018),** Who reported that, more than three quarters of studied subjects were from rural areas. These results contradicted with **Elsadee et al., (2023)** who concluded that majority of them living in urban areas. Also, these results are not supported by **Ibrahim et al., (2019),** who stated that, the highest notification rate are found among urban residents.

Regarding distribution of medical data among patient participant among the chronic diseases, chest disease is the most prevalent, affecting most of participants, followed by diabetes mellitus (more than two fifth) and hypertension (more than one third). Only a small percentage of participants reported renal disease (minority) or other unspecified conditions. This result contraindicated with **Ahmed et al., (2020))** who demonstrated the highest percentage of the participant had diabetes. Also, on the other hand **Mabrouk et al., (2017)** who found that more than one third of asthmatic patients were hypertensive.

Regarding health history, more than two third of the patients had a family history of bronchial asthma. This result in the same hand with **Mohammed et al., (2020)** who concluded that most of the studied patients had a family history of asthma this result agreed with **Ibrahim et al., (2019)** who showed that, near than half of the asthmatic studied patients had a family a history of bronchial asthma. Nevertheless, these results disagreed with **Elbanna et al., (2017)** who found that more than half of patients with asthma did not have a family history of bronchial asthma.

Regarding diagnostic studies, chest x-rays were the most commonly performed, followed by blood tests, lung function tests, and allergy tests. This result agrees with **Akinci, et al. (2022)** who reported that Chest X-rays are one of the most commonly performed diagnostic studies for asthma patients. They are primarily used to rule out other conditions such as pneumonia, pulmonary fibrosis, or lung tumors, which might present with symptoms similar to asthma. Also, this result in the same line with **Leech et al., (2023)** who reported that Blood tests are also commonly used in asthma diagnosis. Elevated levels of eosinophils and specific immunoglobulin E (IgE) are indicative of allergic asthma. Blood tests can help identify markers of inflammation, such as elevated eosinophil count or high IgE levels, which are crucial in identifying atopic asthma.

This result in contrary with the result of **Mohamed & Mohamed, (2023)** who concluded that, less than three quarters of the studied patients had poor knowledge about bronchial asthma. Also, this result in congruent with the study of **Asmare et al., (2021)** who reported that less than one third of the studied patients had poor total knowledge regarding asthma.

These results also contradicted with **Mohammed et al., (2020)** and concluded that most of studied patients had a poor level of knowledge about asthma. These results also contradicted with **Gare et al., (2020),** Who reported that, knowledge about asthma is poor among asthma patients and misconceptions are prevalent.

Regarding the total Knowledge about Risk factors and triggers of bronchial asthma among patient participant, the present study showed that the majority of participants demonstrated unsatisfactory knowledge, while only one seventh had a satisfactory knowledge. From the investigators' point of view: this congruent may due to the residence of the studied sample as more than half were living in rural areas which characterized by low socio-economic status, poor access to medical health and low health literacy, tradition (believing in evil eye and magic), and environmental factors (cold weather, ovens smoking, and pesticides).

This finding was in accordance with a study conducted by **Sadeghi et al., (2022)** who demonstrated that a majority of asthma patients had limited knowledge about the key risk factors and triggers of their condition. Where only one third of them could correctly identify common risk factors such as family history, smoking, and allergens. The remaining two thirds displayed unsatisfactory knowledge, particularly regarding the role of environmental pollutants, obesity, and early-life respiratory infections in asthma development. The study found that this knowledge gap directly correlated with poorer asthma control and higher rates of exacerbations.

As regard Knowledge about Risk factors and triggers of bronchial asthma among patient participant the present study indicated that around three quarter of participants had unsatisfactory knowledge, while only around one third demonstrated satisfactory knowledge.

This result in the same direction with the study conducted by **Ghozali & Urrohmah (2023)** who found that, most participants had a low level of knowledge. Also, supported by a study by **Breysse et al. (2023)** who found that asthma patients with lower levels of health literacy often had unsatisfactory knowledge about the specific triggers of their asthma. The study indicated that a substantial portion of participants was unaware of the link between indoor allergens (e.g., mold and dust mites) and asthma flare-ups.

As regard the relation between Knowledge about disease and demographic data, the present study revealed that significant associations between knowledge and age, marital status, level of education, and residence. Knowledge levels were higher among younger participants and those with higher education, highlighting the influence of these factors on asthma awareness. Marital status also played a role, with widows showing lower levels of knowledge. Notably, participants residing in urban areas demonstrated better knowledge than those in rural areas. No significant relationships were observed for gender or occupation

Also supported by **Elsadee et al., (2023)** who reported that highly statistically significant associations between knowledge and demographic characteristics, statistically significant difference between patients' total level of knowledge. Also, this finding resembles **Mohamed et al., (2022)** who revealed that there was a statistically significant relation between studied patient demographic characteristics such as marital status, education, and occupation, and their total knowledge score. In addition, these results were congruent with **Madhushani & Subasinghe (2016)** who reported that many studies have demonstrated a relationship between asthma knowledge and patients' education.

This finding is opposite with **Alatawi, (2020)** who revealed that there are significant differences in gender, majority of participants have asthma were male, but more than half from participants don't have asthma were male. Also, there are significant differences in asthma according to number of family, and rural. In other side, there aren't significant differences in asthma and other variables. Also, this result disagrees with **Hasan & Mahameed (2020)** who reported that there was no effect of these variables on asthma knowledge except participant education.

Moreover, Incongruent with **Ahmed & Kafl (2017)** who reported that there was no statistical significance between patients' level of knowledge and their age.

As regard relationship between total knowledge about bronchial asthma and demographic variables among studied patients. Significant associations were found for marital status, level of education, and residence. Participants with higher education and those residing in urban areas had better knowledge scores. Marital status also influenced knowledge, with widowed participants displaying lower scores. Age, gender, and occupation were not significantly associated with knowledge levels.

A similar study **Francis et al., (2024)** who indicated that those with higher levels of education were more knowledgeable about asthma. This finding goes in line with **Almomani et al., (2020)** who concluded that age and higher education level was associated with higher knowledge. Additionally, single patients were found to have higher odds of better knowledge compared to married ones.

These results disagree with **Dinglasan et al., (2022)** who found that race is the only demographic factor associated with knowledge level.

In relation to predictors of risk factors and triggers for bronchial asthma among studied participants based on regression analysis. The model is statistically significant, indicating a strong relationship between the variables and risk factors. Significant predictors include family history of predisposing factors, occupational hazards, active smoking, use of chemicals in hair styling, and exposure to irritating factors such as cleaning chemicals. Additional significant predictors are stress and anxiety, premature birth, and outdoor air pollution. Notably, dust mites and activities that increase breathing rate were either weak or insignificant predictors.

But, Inconsistent with **Huo et al., (2021)** who concluded that Family history and genetic predisposition remain strong predictors of asthma. Specific gene polymorphisms associated with immune response and inflammation, such as those related to the IL-13 gene, have been implicated in asthma susceptibility. Genetic factors can influence the immune system's response to environmental triggers, playing a crucial role in asthma pathogenesis.

Also, supported by **Niven et al., (2020)** who mentioned that Occupational asthma is a well-documented phenomenon, with exposure to allergens or irritants at the workplace being a major risk factor for developing asthma or worsening pre-existing asthma. Exposure to substances such as chemicals, fumes, and dusts in industries like farming, construction, and manufacturing can trigger or exacerbate asthma. As well, this result in accordance

with **Gauderman et al., (2019)** who reported that exposure to environmental allergens, such as dust mites, pet dander, pollen, and mold, is a significant risk factor for asthma. In addition, air pollution, particularly exposure to particulate matter and traffic-related pollution, has been shown to increase the risk of asthma onset and exacerbation.

This result in the same direction with the study conducted by **Batalha et al., (2021)** who reported that Obesity has become an increasingly recognized risk factor for asthma. Overweight and obese individuals are more likely to develop asthma, and obesity is associated with increased severity of the disease. Recent research suggests that inflammation associated with excess body fat may contribute to the development and progression of asthma. Also, this result congruent with **Sundbom et al., (2022)** who reported that stress can exacerbate asthma symptoms through pathways involving the immune system and increased airway inflammation.

Conclusions

It was concluded that a majority of patient knowledge about the risk factors and triggers of patients with bronchial asthma include: Outdoor air pollution, Active smoking, occupational hazards, Family history of predisposing factors for bronchial asthma, Exposure to an irritating factor such as chemicals used in cleaning.

Recommendations

The following are recommended based up on the findings of the current study:

1. Providing nursing instructions for patients with insufficient information about the risk factors and triggers of bronchial asthma.
2. Design educational booklet to be used to provide patients with the needed instructions and knowledge about risk factors and triggers of bronchial asthma.
3. Application of the same study on a large sample in other geographic regions to ensure data generalizability.

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