Knowledge, Attitude and Practices of Parents of Asthmatic Children about Asthma in Elwehda village in South of Gezira Locality, Gezira State, Sudan (2017)

Wasima Alhaj Mohamed Ahmed Abdalla
(MBBS, University of Kordofan 2010)

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In
Family Medicine

Department of Family Medicine and Community
Faculty of Medicine

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By:
Wasima Alhaj Mohamed Ahmed Abdalla

Supervision committee

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<td>Main supervisor</td>
<td></td>
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<tr>
<td>Dr. Osman Hamid Abdulhamid</td>
<td>Co-supervisor</td>
<td></td>
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Date:  /  / 2017

Wasima Alhaj Mohamed Ahmed Abdalla

Examination committee

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<td>Dr. Hisham Mustafa Eltayeb</td>
<td>Internal examiner</td>
<td>............</td>
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<tr>
<td>Dr. Sami Eldirdiri Elgaili Salah</td>
<td>External examiner</td>
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بسم الله الرحمن الرحيم

(إِنْ أُرِيدُ إِلاَّ الإِصْلاَحَ مَا اسْتَطَعْتُ وَمَا تَوْفِيقِي إِلاَّ بِاللّهِ عَلَيْهِ تَوَكَّلْتُ وَإِلَيْهِ أُنِيبُ)

صدق الله العظيم

سورة هود (الآية 88)
Dedication

To My dear family father, mother and brothers-. to my lovely kids, to my supportive husband

Wasima
Acknowledgement

My special thanks to Gezira state Family medicine program and it is helpful staff members.

My sincere thankfulness to Prof. Magda Elhadi Ahmed Yousif, professor of community medicine, University of Gezira, for her advisory effort that made this dream comes to true and what so ever she has offered me from her knowledge. She did not hesitate to dedicate her knowledge and time for me, and giving her arguments in this field.

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Eventually my deepest appreciations to my family, who always encourage and support me.
Knowledge Attitude and Practices of Patients and parents of asthmatic children about Asthma in Elwehda village in south of Gezira locality, Gezira states, Sudan (2017)

Wasima Alhaj Mohamed Ahmed Abdalla

Abstract

Asthma is a common chronic inflammatory disease of the airways characterized by variable and recurring symptoms, reversible airflow obstruction, and bronchospasm. Common symptoms include wheezing, coughing, chest tightness, and shortness of breath. This study was done to assess the knowledge attitude and practice of patients and parents of asthmatic children about asthma in Alwehda health Centre in Alwehda village, south of Gezira locality, Gezira state, Sudan. It was a cross sectional, descriptive and community-based study. Patients of Asthma below 18 years and their parents were included with a total sample of 160 participants. Results revealed that, age of children were from 1 to 17 years with a mean age of (8.7 ± 4.26), the most frequent age group was 4-6 with 45 (28.1%). Males were 97 (60.6%). Most of them were in primary schools 88 (55.0%). 121 (75.8%) were knowledgeable about definition of asthma. 78 (48.8%) of the participants were diagnosed as asthmatic by clinical examination. 112 (70.0%) of the patients had family history of Asthma. 110 (68.8%) of them reported that asthma is a lifetime disease. Concerning the knowledge about causes of asthma, 90 (56.4%) were knowledgeable. About signs of asthma, 142 (88.8%) define cough as a sign. 129 (80.6%) were knowledgeable about triggering factors of asthma. Practice of participants in case of asthma was correct in 146 (91.3%). Concerning the practice of patients towards the chemotherapy, those who use Ventolin were 133 (83.1%). Half of the patients had a bad attitude towards management of asthma; they at least took traditional medication for asthma once. About the practice of using Ventolin inhaler, 89 (55.5%) had correct practice. 105 (65.6%) believe that asthma is contagious, 60 (37.5%) had food allergy, 73 (45.6%) were either positive or negative smokers. Two-thirds 106 (66.3%) of the participants were using gas for cooking. 90 (56.3%) had animals at home. From those who had animals at home, 52 (32.5%) their animal were inside home. 104 (65.0%) were using the waste cart in waste disposal. Concerning practice towards environmental factors such as pesticides, poultry farms and bricks ambushes, 115 (71.9%) had a good practice. This study concluded that the level of knowledge towards Asthma was (75.8%) in asthmatic patients below 18 years old and their caretakers. And it recommend that conducting health education programs to improve their practice towards asthma.
مستوى المعرفة والسلوك لدى الأطفال مرضى الأزمة ووالديهم في قرية الوحدة - محلة جنوب الجزيرة - ولاية الجزيرة - السودان 2017

وسيلة النجاح محمد أحمد عبد الله

ملخص الدراسة

الربو هو مرض التهاب شائع في المجاري التنفسية التي تتميز بأعراض متغيرة ومترددة، عرقلة انسداد تدفق الهواء، وتضيق قصبي، وتشنج قصبي. وتشمل الأعراض الشائعة الصفير، والسعال، وضيق الصدر، وضيق في التنفس.

أجريت هذه الدراسة لتقييم معارف وأي لمس ومارسات المرضى المصابين بالربو وأولياء أمورهم حول الربو في مركز صحية الوحدة جنوب الجزيرة، ولاية الجزيرة، السودان. كانت دراسة مقطعية ووصفية ومجتمعة. تم ضم مرضى الربو الأقل من 18 عاماً وأولياء أمورهم مع عينة إجمالية من 160 شابًا.

النتائج التي تم العثور عليها، تراوحت أعمار المشاركين من 1 إلى 17 سنة مع متوسط عمر (8.7 ± 4.26)، وكانت الفئة العمرية الأكثر شيوعاً 4-6 مع (28.1%)، وكان الذكور 97 (60.6%). وكان مستوى تعليم معظمهم هو المرحلة الابتدائية (55.0%). وكان درج 78 (48.8%) من المرضى لديهم تاريخ عائلي للربو. 110 (68.8%) منهم قالوا أن الربو هو مرض مدى الحياة وفيما يتعلق بمعرفة أسباب الربو، كان 90 (56.4%) على دراية.

تختلف علامات الربو، 142 (88.8%) يعرفون السعال كعلامة. 129 (80.6%) كانوا على دراية بالعوامل المسببة للربو. كممارسات الشباب حول حالة الربو صحيحة في 146 (91.3%). وفيما يتعلق بممارسة المرضى نحو العلاج الكيميائي، كان أولئك الذين يستخدمون فينتولين 133 (83.1%). وكان نصف المرضى الذين اعتمدوا على طرق الرعاية الأخرى (55.5%) كانوا يستخدمون خلطات وصفية. وكان 115 (71.9%) من المشاركين يستخدمون غاز الصوديوم ترشيدياً.

علاوةً على ذلك، كان 104 (65.6%) كانوا يستخدمون معالجة للربوبية، وكان 102 (63.8%) كانوا يستخدمون غازات لايف برات بشكل صحيح. 90 (56.3%) لديهم حيوانات في المنزل. 104 (65.6%) كانوا يستخدمون غازات لعلاج الربوبية، وكان 105 (65.6%) كانوا يستخدمون معالجة للربوبية بشكل صحيح. 103 (64.3%) كانوا يستخدمون غازات لعلاج الربوبية، وكان 106 (63.8%) كانوا يستخدمون غازات لعلاج الربوبية.

توصيات الدراسة

واصلت هذه الدراسة أن مستوى المعرفة، وتوصي الدراسة بتحديث دورات التثقيف الصحي لتحسين مستوى
الممارسات لعلاج مرض الأزمة.
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Chapter One

Introduction

Background:

Asthma is a common chronic inflammatory disease of the airways characterized by variable and recurring symptoms, reversible airflow obstruction, and bronchospasm. Common symptoms include wheezing, coughing, chest tightness, and shortness of breath.\(^1\)

Asthma is thought to be caused by a combination of genetic and environmental factors. Its diagnosis is usually based on the pattern of symptoms, response to therapy over time, and spirometry. It is clinically classified according to the frequency of symptoms, forced expiratory volume in one second (FEV1), and peak expiratory flow rate. Asthma may also be classified as atopic (extrinsic) or non-atopic (intrinsic) where atopy refers to a predisposition toward developing type 1 hypersensitivity reactions.\(^2\)

Treatment of acute symptoms is usually with an inhaled short-acting beta-2 agonist (such as salbutamol) and oral corticosteroids. In very severe cases intravenous corticosteroids, magnesium sulfate and hospitalization maybe required. Symptoms can be prevented by avoiding triggers, such as allergens and irritants, and by the use of inhaled corticosteroids. Long-acting beta agonists (LABA) or leukotriene antagonists may be used in addition to inhaled corticosteroids if asthma symptoms remain uncontrolled. The prevalence of asthma has increased significantly since the 1970s. As of 2011, 235–300 million people were affected globally, including about 250,000 deaths.\(^1,3\)

Acute severe asthma:

Also known as “status asthmaticus”, it is an attack of asthma which poses difficulties because it does not respond to conventional and usually effective bronchodilator drugs and even intensive treatment measures in the first few hours. It may develop suddenly or gradually, but is a life-threatening emergency, which may lead to respiratory
failure. Immediate hospitalization of the patient in the Critical/Intensive Care Unit is mandatory for expert management, supervision, and monitoring. The main reasons for increased mortality in acute severe asthma are:

1. Failure in assessing the gravity of the situation and its physiological implications and consequences.

2. Sub-optimal pharmacological therapy and delay in providing mechanical ventilatory support when required.

**Problem statement**

Bronchial asthma is a chronic serious and common condition that affects physical, psychological, and social health of individuals. It's an increasing problem in Alwehda village according to a study done to assess risk factors and prevalence of asthma in 2014 and the prevalence was 58% among population above 18 years which is a very high percentage. Asthma is the most common chronic disease among children. It is not just a public health problem for high-income countries; it occurs in all countries regardless of the level of development. Over 80% of asthma deaths occur in low and lower-middle income countries. An estimated 14 to 15 million persons in the United States have asthma (about 5% of the population). Asthma is the most common chronic disease among children in the United States, with approximately 5 million children affected. Over the past two decades in the United States, the prevalence of asthma has increased by 75%, whereas the rate in children younger than age 5 has increased 160%.

Asthma affects all ages, sexes, and ethnic groups, and environmental factors seem to be the main problem of the population due to bad habits including burning of waste inside the village beside houses, and presence of domestic animals inside homes.

**Justification**

Bronchial asthma is a serious chronic illness and a leading cause of morbidity and mortality. The severity of asthma is visible through its contribution toward 3, 74,678 deaths in 2011, which is a considerable number. Asthma prevalence in children is increasing worldwide. Almost 6.3 million people with asthma are under the age of 18.
There is a high number of asthatics attended Elwehda health center.

Asthma affects many aspects of life in childhood it affects general health and development, in school age it affects attendance and performance, in the other hand in adults it can affects work by recurrent absence which may lead to financial and social problems.

Objectives:

General objective:

To assess the knowledge attitude and practice of patients and parents of asthmatic children about asthma in Alwehda health Centre in Alwehda village, south of Gezira locality, Gezira state, Sudan.

Specific objectives:

1. To determine the knowledge of asthmatic patients about the causes of asthma, types of medical treatment used by them.
2. To identify attitude of asthmatic patients towards risk factors or triggering factors.
3. To determine practice of asthmatics towards asthmatic attacks.
Chapter two

Literature Review

Asthma is a common long-term inflammatory disease of the airways of the lungs. It is characterized by variable and recurring symptoms, reversible airflow obstruction, and bronchospasm. Symptoms include episodes of wheezing, coughing, chest tightness, and shortness of breath. These episodes may occur a few times a day or a few times per week. Depending on the person they may become worse at night or with exercise. Asthma is thought to be caused by a combination of genetic and environmental factors. Environmental factors include exposure to air pollution and allergens. Other potential triggers include medications such as aspirin and beta blockers. Diagnosis is usually based on the pattern of symptoms, response to therapy over time, and spirometry. Asthma is classified according to the frequency of symptoms, forced expiratory volume in one second (FEV1), and peak expiratory flow rate. It may also be classified as atopic or non-atopic where atopy refers to a predisposition toward developing a type I hypersensitivity reaction.

There is no cure for asthma. Symptoms can be prevented by avoiding triggers, such as allergens and irritants, and by the use of inhaled corticosteroids. Long-acting beta agonists (LABA) or antileukotriene agents may be used in addition to inhaled corticosteroids if asthma symptoms remain uncontrolled. Treatment of rapidly worsening symptoms is usually with an inhaled short-acting beta-2 agonist such as salbutamol and corticosteroids taken by mouth. In very severe cases, intravenous corticosteroids, magnesium sulfate, and hospitalization may be required.

In 2015, 358 million people globally had asthma up from 183 million in 1990. It caused about 397,100 deaths in 2015, most of which occurred in the developing world. It often begins in childhood. The rates of asthma have increased significantly since the 1960s. Asthma was recognized as early as Ancient Egypt. The word asthma is from the Greek ἀσθμα, ásthma which means "panting."
Signs and symptoms

Asthma is characterized by recurrent episodes of wheezing, shortness of breath, chest tightness, and coughing. Sputum may be produced from the lung by coughing but is often hard to bring up. During recovery from an attack, it may appear pus-like due to high levels of white blood cells called eosinophils. 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 have marked and persistent symptoms.12

Associated conditions

A number of other health conditions occur more frequently in those with asthma, including gastro-esophageal reflux disease (GERD), rhinosinusitis, and obstructive sleep apnea. Psychological disorders are also more common, with anxiety disorders occurring in between 16–52% and mood disorders in 14–41%. However, it is not known if asthma causes psychological problems or if psychological problems lead to asthma. Those with asthma, especially if it is poorly controlled, are at high risk for radiocontrast reactions.13

Causes

Asthma is caused by a combination of complex and incompletely understood environmental and genetic interactions. These factors influence both its severity and its responsiveness to treatment. It is believed that the recent increased rates of asthma are due to changing epigenetics (heritable factors other than those related to the DNA sequence) and a changing living environment. Onset before age 12 is more likely due to genetic influence, while onset after 12 is more likely due to environmental influence.14

Environmental

Many environmental factors have been associated with asthma's development and exacerbation including allergens, air pollution, and other environmental chemicals.15 Smoking during pregnancy and after delivery is associated with a greater risk of asthma-like symptoms. Low air quality from factors such as traffic pollution or high ozone levels has been associated with both asthma development and increased asthma
severity. Over half of cases in children in the United States occur in areas with air quality below EPA standards. Low air quality is more common in low-income and minority communities.\textsuperscript{16}

Exposure to indoor volatile organic compounds may be a trigger for asthma; formaldehyde exposure, for example, has a positive association. Also, phthalates in certain types of PVC are associated with asthma in children and adults.\textsuperscript{17}

There is an association between acetaminophen (paracetamol) use and asthma. The majority of the evidence does not, however, support a causal role. A 2014 review found that the association disappeared when respiratory infections were taken into account. Use by a mother during pregnancy is also associated with an increased risk as is psychological stress during pregnancy.\textsuperscript{18}

Asthma is associated with exposure to indoor allergens. Common indoor allergens include dust mites, cockroaches, animal dander (fragments of fur or feathers), and mold. Efforts to decrease dust mites have been found to be ineffective on symptoms in sensitized subjects. Certain viral respiratory infections, such as respiratory syncytial virus and rhinovirus, may increase the risk of developing asthma when acquired as young children. Certain other infections, however, may decrease the risk.\textsuperscript{19}

**Hygiene hypothesis**

The hygiene hypothesis attempts to explain the increased rates of asthma worldwide as a direct and unintended result of reduced exposure, during childhood, to non-pathogenic bacteria and viruses. It has been proposed that the reduced exposure to bacteria and viruses is due, in part, to increased cleanliness and decreased family size in modern societies. Exposure to bacterial endotoxin in early childhood may prevent the development of asthma, but exposure at an older age may provoke bronchoconstriction. Evidence supporting the hygiene hypothesis includes lower rates of asthma on farms and in households with pets.\textsuperscript{20}

Use of antibiotics in early life has been linked to the development of asthma. Also, delivery via caesarean section is associated with an increased risk (estimated at 20–80\%) of asthma—this increased risk is attributed to the lack of healthy bacterial colonization that the newborn would have acquired from passage through the birth canal. There is a link between asthma and the degree of affluence which may be
related to the hygiene hypothesis as less affluent individuals often have more exposure to bacteria and viruses.\textsuperscript{21}

**Genetic**

Family history is a risk factor for asthma, with many different genes being implicated. If one identical twin is affected, the probability of the other having the disease is approximately 25%. By the end of 2005, 25 genes had been associated with asthma in six or more separate populations, including GSTM1, IL10, CTLA-4, SPINK5, LTC4S, IL4R and ADAM33, among others. Many of these genes are related to the immune system or modulating inflammation. Even among this list of genes supported by highly replicated studies, results have not been consistent among all populations tested. In 2006 over 100 genes were associated with asthma in one genetic association study alone; more continue to be found.\textsuperscript{22}

Some genetic variants may only cause asthma when they are combined with specific environmental exposures. An example is a specific single nucleotide polymorphism in the CD14 region and exposure to endotoxin (a bacterial product). Endotoxin exposure can come from several environmental sources including tobacco smoke, dogs, and farms. Risk for asthma, then, is determined by both a person's genetics and the level of endotoxin exposure.\textsuperscript{23}

**Medical conditions**

A triad of atopic eczema, allergic rhinitis and asthma is called atopy. The strongest risk factor for developing asthma is a history of atopic disease; with asthma occurring at a much greater rate in those who have either eczema or hay fever. Asthma has been associated with eosinophilic granulomatosis with polyangiitis (formerly known as Churg–Strauss syndrome), an autoimmune disease and vasculitis. Individuals with certain types of urticaria may also experience symptoms of asthma.\textsuperscript{24}

There is a correlation between obesity and the risk of asthma with both having increased in recent years. Several factors may be at play including decreased respiratory function due to a buildup of fat and the fact that adipose tissue leads to a pro-inflammatory state.\textsuperscript{25}
Beta blocker medications such as propranolol can trigger asthma in those who are susceptible. Cardio selective beta-blockers, however, appear safe in those with mild or moderate disease. Other medications that can cause problems in asthmatics are angiotensin-converting enzyme inhibitors, aspirin, and NSAIDs.26

**Exacerbation**

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.27

Home factors that can lead to exacerbation of asthma include dust, animal dander (especially cat and dog hair), cockroach allergens and mold. Perfumes are a common cause of acute attacks in women and children. Both viral and bacterial infections of the upper respiratory tract can worsen the disease. 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.28

**Pathophysiology**

Asthma is the result of chronic inflammation of the conducting zone of the airways (most especially the bronchi and bronchioles), which subsequently results in increased contractility of the surrounding smooth muscles. This among other factors leads to bouts of narrowing of the airway and the classic symptoms of wheezing. The narrowing is typically reversible with or without treatment. Occasionally the airways themselves change. Typical changes in the airways include an increase in eosinophils and thickening of the lamina reticularis. Chronically the airways' smooth muscle may increase in size along with an increase in the numbers of mucous glands. Other cell types involved include: T lymphocytes, macrophages, and neutrophils. There may also be involvement of other components of the immune system including: cytokines, chemokines, histamine, and leukotrienes among others.29

**Diagnosis**

While asthma is a well-recognized condition, there is not one universal agreed upon definition. It is defined by the Global Initiative for Asthma as "a chronic inflammatory
disorder of the airways in which many cells and cellular elements play a role. The chronic inflammation is associated with airway hyper-responsiveness that leads to recurrent episodes of wheezing, breathlessness, chest tightness and coughing particularly at night or in the early morning. These episodes are usually associated with widespread but variable airflow obstruction within the lung that is often reversible either spontaneously or with treatment.\textsuperscript{30}

There is currently no precise test for the diagnosis, which is typically based on the pattern of symptoms and response to therapy over time. A diagnosis of asthma should be suspected if there is a history of recurrent wheezing, coughing or difficulty breathing and these symptoms occur or worsen due to exercise, viral infections, allergens or air pollution. Spirometry is then used to confirm the diagnosis. In children under the age of six the diagnosis is more difficult as they are too young for spirometry.\textsuperscript{31}

**Spirometry**

Spirometry is recommended to aid in diagnosis and management. It is the single best test for asthma. If the FEV1 measured by this technique improves more than 12\% and increases by at least 200 milliliters following administration of a bronchodilator such as salbutamol, this is supportive of the diagnosis. It however may be normal in those with a history of mild asthma, not currently acting up. As caffeine is a bronchodilator in people with asthma, the use of caffeine before a lung function test may interfere with the results. Single-breath diffusing capacity can help differentiate asthma from COPD. It is reasonable to perform spirometry every one or two years to follow how well a person's asthma is controlled.\textsuperscript{32}

**Others**

The methacholine challenge involves the inhalation of increasing concentrations of a substance that causes airway narrowing in those predisposed. If negative it means that a person does not have asthma; if positive, however, it is not specific for the disease.\textsuperscript{33}

Other supportive evidence includes: a \(\geq 20\%\) difference in peak expiratory flow rate on at least three days in a week for at least two weeks, a \(\geq 20\%\) improvement of peak flow following treatment with either salbutamol, inhaled corticosteroids or prednisone, or a \(\geq 20\%\) decrease in peak flow following exposure to a trigger. Testing
peak expiratory flow is more variable than spirometry, however, and thus not recommended for routine diagnosis. It may be useful for daily self-monitoring in those with moderate to severe disease and for checking the effectiveness of new medications. It may also be helpful in guiding treatment in those with acute exacerbations.34

**Classification**

Asthma is clinically classified according to the frequency of symptoms, forced expiratory volume in one second (FEV1), and peak expiratory flow rate. Asthma may also be classified as atopic (extrinsic) or non-atopic (intrinsic), based on whether symptoms are precipitated by allergens (atopic) or not (non-atopic). While asthma is classified based on severity, at the moment there is no clear method for classifying different subgroups of asthma beyond this system. Finding ways to identify subgroups that respond well to different types of treatments is a current critical goal of asthma research.35

Although asthma is a chronic obstructive condition, it is not considered as a part of chronic obstructive pulmonary disease as this term refers specifically to combinations of disease that are irreversible such as bronchiectasis, chronic bronchitis, and emphysema. Unlike these diseases, the airway obstruction in asthma is usually reversible; however, if left untreated, the chronic inflammation from asthma can lead the lungs to become irreversibly obstructed due to airway remodeling. In contrast to emphysema, asthma affects the bronchi, not the alveoli.36

**Asthma exacerbation**

An acute asthma exacerbation is commonly referred to as an asthma attack. The classic symptoms are shortness of breath, wheezing, and chest tightness. The wheezing is most often when breathing out. While these are the primary symptoms of asthma, some people present primarily with coughing, and in severe cases, air motion may be significantly impaired such that no wheezing is heard. In children, chest pain is often present.37

Signs which occur during an asthma attack include the use of accessory muscles of respiration (sternocleidomastoid and scalene muscles of the neck), there may be a paradoxical pulse (a pulse that is weaker during inhalation and stronger during
exhalation), and over-inflation of the chest. A blue color of the skin and nails may occur from lack of oxygen.\textsuperscript{38}

In a mild exacerbation the peak expiratory flow rate (PEFR) is ≥200 L/min or ≥50% of the predicted best. Moderate is defined as between 80 and 200 L/min or 25% and 50% of the predicted best while severe is defined as ≤ 80 L/min or ≤25% of the predicted best.\textsuperscript{39}

Acute severe asthma, previously known as status asthmaticus, is an acute exacerbation of asthma that does not respond to standard treatments of bronchodilators and corticosteroids. Half of cases are due to infections with others caused by allergen, air pollution, or insufficient or inappropriate medication use.\textsuperscript{40}

Brittle asthma is a kind of asthma distinguishable by recurrent, severe attacks. Type 1 brittle asthma is a disease with wide peak flow variability, despite intense medication. Type 2 brittle asthma is background well-controlled asthma with sudden severe exacerbations.\textsuperscript{41}

**Exercise-induced**

Exercise can trigger bronchoconstriction both in people with or without asthma. It occurs in most people with asthma and up to 20% of people without asthma. Exercise-induced bronchoconstriction is common in professional athletes. The highest rates are among cyclists (up to 45%), swimmers, and cross-country skiers. While it may occur with any weather conditions it is more common when it is dry and cold. Inhaled beta2-agonists do not appear to improve athletic performance among those without asthma however oral doses may improve endurance and strength.\textsuperscript{42}

**Occupational**

Asthma as a result of (or worsened by) workplace exposures, is a commonly reported occupational disease. Many cases however are not reported or recognized as such. It is estimated that 5–25% of asthma cases in adults are work-related. A few hundred different agents have been implicated with the most common being: isocyanates, grain and wood dust, colophony, soldering flux, latex, animals, and aldehydes. The employment associated with the highest risk of problems include: those who spray
paint, bakers and those who process food, nurses, chemical workers, those who work with animals, welders, hairdressers and timber workers.\textsuperscript{43}

\textbf{Aspirin-induced asthma}

Aspirin-exacerbated respiratory disease, also known as aspirin-induced asthma, affects up to 9\% of asthmatics. Reactions may also occur to other NSAIDs. People affected often also have trouble with nasal polyps. In people who are affected low doses paracetamol or COX-2 inhibitors are generally safe.\textsuperscript{44}

\textbf{Alcohol-induced asthma}

Alcohol may worsen asthmatic symptoms in up to a third of people. This may be even more common in some ethnic groups such as the Japanese and those with aspirin-induced asthma. Other studies have found improvement in asthmatic symptoms from alcohol.\textsuperscript{45}

\textbf{Non-allergic asthma}

Non-allergic asthma, also known as intrinsic or non-atopic asthma makes up between 10 and 33\% of cases. There is negative skin test to common inhalant allergens and normal serum concentrations of IgE. Often it starts later in life and women are more commonly affected than men. Usual treatments may not work as well.\textsuperscript{46}

\textbf{Differential diagnosis}

Many other conditions can cause symptoms similar to those of asthma. In children, other upper airway diseases such as allergic rhinitis and sinusitis should be considered as well as other causes of airway obstruction including: foreign body aspiration, tracheal stenosis or laryngotracheomalacia, vascular rings, enlarged lymph nodes or neck masses. Bronchiolitis and other viral infections may also produce wheezing. In adults, COPD, congestive heart failure, airway masses, as well as drug-induced coughing due to ACE inhibitors should be considered. In both populations vocal cord dysfunction may present similarly.\textsuperscript{47}

Chronic obstructive pulmonary disease can coexist with asthma and can occur as a complication of chronic asthma. After the age of 65, most people with obstructive airway disease will have asthma and COPD. In this setting, COPD can be differentiated by increased airway neutrophils, abnormally increased wall thickness,
and increased smooth muscle in the bronchi. However, this level of investigation is not performed due to COPD and asthma sharing similar principles of management: corticosteroids, long-acting beta-agonists, and smoking cessation. It closely resembles asthma in symptoms, is correlated with more exposure to cigarette smoke, an older age, less symptom reversibility after bronchodilator administration, and decreased likelihood of family history of atopy.48

Prevention

The evidence for the effectiveness of measures to prevent the development of asthma is weak. Some show promise including: limiting smoke exposure both in utero and after delivery, breastfeeding, and increased exposure to daycare or large families but none are well supported enough to be recommended for this indication. Early pet exposure may be useful. Results from exposure to pets at other times are inconclusive and it is only recommended that pets be removed from the home if a person has allergic symptoms to said pet. Dietary restrictions during pregnancy or when breastfeeding have not been found to be effective and thus are not recommended. Reducing or eliminating compounds known to sensitive people from the workplace may be effective. It is not clear if annual influenza vaccinations affect the risk of exacerbations. Immunization; however, is recommended by the World Health Organization. Smoking bans are effective in decreasing exacerbations of asthma.49

Management

While there is no cure for asthma, symptoms can typically be improved. A specific, customized plan for proactively monitoring and managing symptoms should be created. This plan should include the reduction of exposure to allergens, testing to assess the severity of symptoms, and the usage of medications. The treatment plan should be written down and advise adjustments to treatment according to changes in symptoms.50

The most effective treatment for asthma is identifying triggers, such as cigarette smoke, pets, or aspirin, and eliminating exposure to them. If trigger avoidance is insufficient, the use of medication is recommended. Pharmaceutical drugs are selected based on, among other things, the severity of illness and the frequency of symptoms.
Specific medications for asthma are broadly classified into fast-acting and long-acting categories.\textsuperscript{51}

Bronchodilators are recommended for short-term relief of symptoms. In those with occasional attacks, no other medication is needed. If mild persistent disease is present (more than two attacks a week), low-dose inhaled corticosteroids or alternatively, an oral leukotriene antagonist or a mast cell stabilizer is recommended. For those who have daily attacks, a higher dose of inhaled corticosteroids is used. In a moderate or severe exacerbation, oral corticosteroids are added to these treatments.\textsuperscript{52}

**Lifestyle modification**

Avoidance of triggers is a key component of improving control and preventing attacks. The most common triggers include allergens, smoke (tobacco and other), air pollution, non-selective beta-blockers, and sulfite-containing foods. Cigarette smoking and second-hand smoke (passive smoke) may reduce the effectiveness of medications such as corticosteroids. Laws that limit smoking decrease the number of people hospitalized for asthma. Dust mite control measures, including air filtration, chemicals to kill mites, vacuuming, mattress covers and others methods had no effect on asthma symptoms. Overall, exercise is beneficial in people with stable asthma. Yoga could provide small improvements in quality of life and symptoms in people with asthma.\textsuperscript{53}

**Medications**

Medications used to treat asthma are divided into two general classes: quick-relief medications used to treat acute symptoms; and long-term control medications used to prevent further exacerbation. Antibiotics are generally not needed for sudden worsening of symptoms.\textsuperscript{54}

**Fast acting**

- Short-acting beta2-adrenoceptor agonists (SABA), such as salbutamol (albuterol USAN) are the first line treatment for asthma symptoms. They are recommended before exercise in those with exercise induced symptoms.\textsuperscript{55}
- Anticholinergic medications, such as ipratropium bromide, provide additional benefit when used in combination with SABA in those with moderate or severe symptoms. Anticholinergic bronchodilators can also be used if a person
cannot tolerate a SABA. If a child requires admission to hospital additional ipratropium does not appear to help over a SABA.\textsuperscript{56}

- Older, less selective adrenergic agonists, such as inhaled epinephrine, have similar efficacy to SABAs. They are however not recommended due to concerns regarding excessive cardiac stimulation.\textsuperscript{57}

**Long-term control**

- Corticosteroids are generally considered the most effective treatment available for long-term control. Inhaled forms such as beclomethasone are usually used except in the case of severe persistent disease, in which oral corticosteroids may be needed. It is usually recommended that inhaled formulations be used once or twice daily, depending on the severity of symptoms.\textsuperscript{58}

- Long-acting beta-adrenoceptor agonists (LABA) such as salmeterol and formoterol can improve asthma control, at least in adults, when given in combination with inhaled corticosteroids. In children this benefit is uncertain. When used without steroids they increase the risk of severe side-effects and even with corticosteroids they may slightly increase the risk.\textsuperscript{59}

- Leukotriene receptor antagonists (such as montelukast and zafirlukast) may be used in addition to inhaled corticosteroids, typically also in conjunction with a LABA. Evidence is insufficient to support use in acute exacerbations. In children they appear to be of little benefit when added to inhaled steroids, and the same applies in adolescents and adults. They are useful by themselves. In those under five years of age, they were the preferred add-on therapy after inhaled corticosteroids by the British Thoracic Society in 2009. A similar class of drugs, 5-LOX inhibitors, may be used as an alternative in the chronic treatment of mild to moderate asthma among older children and adults. As of 2013 there is one medication in this family known as zileuton.\textsuperscript{60}

- Mast cell stabilizers (such as cromolyn sodium) are another non-preferred alternative to corticosteroids.\textsuperscript{61}
Delivery methods

Medications are typically provided as metered-dose inhalers (MDIs) in combination with an asthma spacer or as a dry powder inhaler. The spacer is a plastic cylinder that mixes the medication with air, making it easier to receive a full dose of the drug. A nebulizer may also be used. Nebulizers and spacers are equally effective in those with mild to moderate symptoms. However, insufficient evidence is available to determine whether a difference exists in those with severe disease.62

Adverse effects

Long-term use of inhaled corticosteroids at conventional doses carries a minor risk of adverse effects. Risks include the development of cataracts and a mild regression in stature.63

Others

When asthma is unresponsive to usual medications, other options are available for both emergency management and prevention of flare-ups. For emergency management other options include:

- Corticosteroid by mouth are recommended with five days of prednisone being the same 2 days of dexamethasone. One review recommended a seven-day course of steroids.64
- Magnesium sulfate intravenous treatment increases bronchodilation when used in addition to other treatment in moderate severe acute asthma attacks. In adults it results in a reduction of hospital admissions.65
- Heliox, a mixture of helium and oxygen, may also be considered in severe unresponsive cases.66
- Intravenous salbutamol is not supported by available evidence and is thus used only in extreme cases.67
- Methylxanthines (such as theophylline) were once widely used, but do not add significantly to the effects of inhaled beta-agonists. Their use in acute exacerbations is controversial.68
- The dissociative anesthetic ketamine is theoretically useful if intubation and mechanical ventilation is needed in people who are approaching respiratory
arrest; however, there is no evidence from clinical trials to support this. It is unclear if non-invasive positive pressure ventilation in children is of use as it has not been sufficiently studied.69

For those with severe persistent asthma not controlled by inhaled corticosteroids and LABAs, bronchial thermoplasty may be an option. It involves the delivery of controlled thermal energy to the airway wall during a series of bronchoscopies. While it may increase exacerbation frequency in the first few months it appears to decrease the subsequent rate. Effects beyond one year are unknown. Evidence suggests that sublingual immunotherapy in those with both allergic rhinitis and asthma improve outcomes.70

Alternative medicine

Many people with asthma, like those with other chronic disorders, use alternative treatments; surveys show that roughly 50% use some form of unconventional therapy. There is little data to support the effectiveness of most of these therapies. Evidence is insufficient to support the usage of Vitamin C. There is tentative support for its use in exercise induced bronchospasm. In people with mild to moderate asthma, treatment with vitamin D supplementation is likely to reduce the risk of asthma exacerbations.71

Acupuncture is not recommended for the treatment as there is insufficient evidence to support its use. Air ionisers show no evidence that they improve asthma symptoms or benefit lung function; this applied equally to positive and negative ion generators.72

Manual therapies, including osteopathic, chiropractic, physiotherapeutic and respiratory therapeutic maneuvers, have insufficient evidence to support their use in treating asthma. The Buteyko breathing technique for controlling hyperventilation may result in a reduction in medication use; however, the technique does not have any effect on lung function. Thus an expert panel felt that evidence was insufficient to support its use.73
Prognosis

The prognosis for asthma is generally good, especially for children with mild disease. Mortality has decreased over the last few decades due to better recognition and improvement in care. In 2010 the death rate was 170 per million for males and 90 per million for females. Rates vary between countries by 100 fold.74

Globally it causes moderate or severe disability in 19.4 million people as of 2004 (16 million of which are in low and middle income countries). Of asthma diagnosed during childhood, half of cases will no longer carry the diagnosis after a decade. Airway remodeling is observed, but it is unknown whether these represent harmful or beneficial changes. Early treatment with corticosteroids seems to prevent or ameliorates a decline in lung function. Asthma in children also has negative effects on quality of life of their parents.75

Epidemiology

As of 2011, 235–330 million people worldwide are affected by asthma, and approximately 250,000–345,000 people die per year from the disease. Rates vary between countries with prevalence between 1 and 18%. It is more common in developed than developing countries. One thus sees lower rates in Asia, Eastern Europe and Africa. Within developed countries it is more common in those who are economically disadvantaged while in contrast in developing countries it is more common in the affluent. The reason for these differences is not well known. Low and middle income countries make up more than 80% of the mortality.76

While asthma is twice as common in boys as girls, severe asthma occurs at equal rates. In contrast adult women have a higher rate of asthma than men and it is more common in the young than the old. In children, asthma was the most common reason for admission to the hospital following an emergency department visit in the US in 2011.77

Global rates of asthma have increased significantly between the 1960s and 2008 with it being recognized as a major public health problem since the 1970s. Rates of asthma have plateaued in the developed world since the mid-1990s with recent increases primarily in the developing world. Asthma affects approximately 7% of the
population of the United States and 5% of people in the United Kingdom. Canada, Australia and New Zealand have rates of about 14–15%.  

**Economics**

From 2000 to 2010, the average cost per asthma-related hospital stay in the United States for children remained relatively stable at about $3,600, whereas the average cost per asthma-related hospital stay for adults increased from $5,200 to $6,600. In 2010, Medicaid was the most frequent primary payer among children and adults aged 18–44 years in the United States; private insurance was the second most frequent payer. Among both children and adults in the lowest income communities in the United States there is a higher rate of hospital stays for asthma in 2010 than those in the highest income communities.  

**Previous studies:**

A cross-sectional study KAP study conducted in China in 2013. Results: The response rate was 83.95% (2485/2960). Only 18.31% (455/2485) of parents correctly answered 60% of the knowledge questions (mean = 5.69). Most (89.85%) gave positive responses to 60% of the attitude questions (mean = 5.23) while 67.89% correctly answered 60% of the practices questions (mean = 6.19) generally, the parents' KAP were poor. A gap between recommended and actual practice was observed, which may be related to inadequate knowledge about and poor attitudes toward childhood asthma.  

A cross-sectional study performed during September 2013 in Chennai, India conducted to assess asthma knowledge in the parents of asthmatic children and to understand parent's attitude and practices in dealing with the exacerbation of their children's asthma. With sample size of 100 parents with a child aged 8 years and above, diagnosed with bronchial asthma. Results: 62% children were male and 38% female, 41% were aware of inhaler therapy. (61%) felt that asthma was reversible bronchial obstruction, (16%) believed that it was a communicable disease, genetic problem (4%). (28%) knew that chronic cough could be an indication of the asthma condition, while 53% were not able to decide whether it is a symptom of the asthma condition. (41%) identified cold stimulation, exposure to allergens, and strong emotional changes as stimuli of asthma attacks. (28%) mentioned restricted breathing
as symptoms. (80%) of the parents responded that they did not know what an inhaled corticosteroid was, and most (86%) respondents were aware of inhaler therapy. Tobacco smoke was perceived as a trigger (by 85%) for asthma. Cold air was the second most perceived trigger (80%). (48%) of the participants reported that pollen/outdoor mold one of the precipitating factors in their child (48%). (30%) exercise as one of the triggers for asthma. (95%) believed that regular medication can control asthma attacks, (50%) felt that medication might cause drug dependency, while 34% thought that it could cause weakening of immunity. 

A cross-sectional survey was conducted in Saudi Arabia to assess parenteral perceptions and practice toward childhood asthma, aged between 3 and 15 years. 600 (41.4%) of parents reported that their children had asthma, dyspnea, or chest allergy (recurrent wheezing or coughing), while 478 (32.9%) of the parents reported that their children were diagnosed earlier with asthma by a physician, on parental perceptions of asthma in a Saudi population revealed that 53.5% of parents of asthmatic children believed that asthma is a hereditary disease and interestingly 77% reported the dust or allergen a potent trigger factor, proportions of parents were concerned about the side effects of asthma medications (91%) and inhaler dependency (86%). in Saudi Arabia, about 82.7% patients use β-agonist, while only 7.2% use inhaled steroids.

A hospital based cross-sectional study conducted in a tertiary care hospital in Belgaum, India from January 2014 to June 2015. Sample size taken was 150 children age group between 5, 12 years with asthma and their parents. Age of patients was 9.50 (±2.3) years with slight male preponderance (M: F 1:54). Knowledge about etiology and the disease: Out of 150 patients, more than two-third of the parents did not know that their child is suffering from bronchial asthma disease. Only 20% of the parents were aware about the diagnosis of bronchial asthma in their child. In this study, it was observed that parents of asthmatic child identify the disease as breathlessness (around 76% ±12%) and recurrent attacks of cough (65% ±16%). Another 14.4% (±9%) of parents attribute it to wheezing while 41.3% (±11.2%) patients claim it to be recurrent cold and cough. About 30.7% (±9.9%) of parents believe it to be some kind of allergy or associated with some allergic cause. Regarding precipitating factors, 46% (±13.2%) of parents could not relate to any cause or factors triggering their disease. Out of remaining 81 parents who were aware of their triggers,
58 (71.6%) parents used to avoid them. Parents had some knowledge about triggering factors in the food items. About 87% (±17.5%) of the parents considered respiratory tract infections as precipitating factor for asthma, while 13% (±6.9%) did not know whether infections can precipitate asthma or not. Another 31.3% (±9.7%) parents told that the respiratory symptoms get exacerbated during the seasonal change, especially during winter climate that is to say cold weather. Dust was recognized as precipitating factor by 70% (±21.6%) and smoke by 63% (±16.8%) of the parents. About 46% (9.8%) identified multiple items to be the triggering event. Only 20% (±8.8%) parents could recognize house mites as precipitating factor while 28% (±6.5%) thought that pollens can precipitate asthma. almost 77% (±17.8%) of parents were ignorant regarding etiology of their disease; 30.7% (±7.5%) parents believed it to be of allergic etiology; 18.5% (±6.4%) parents attribute it to genetic; 5.6% (±1.6%) patients had the misconception that it is the curse of God. Regarding the fate of disease, majority of parents (41% ± 2.5%) were under the wrong belief that asthma is fatal in outcome, while 36.4% (±6.8%) parents believed that their disease is absolutely curable. Only 22.6% (±4.7%) parents believed that their disease is preventable and can be controlled. Almost half of the parents had sought for medical help for the control of the disease. About 43.3% believed that their child should not use the inhaler and it would become a habit permanently. And 10% think that inhaled therapy is harmful or addictive.

A descriptive, cross sectional study has been carried out in in Khartoum State during the period from January to June 2005. 490 patients were selected randomly from those presenting to the emergency department. Age 16 years and above. Asthma was believed to be infectious by 5% of patients and inherited by 67%. The role of inflammation in the pathogenesis of asthma was known to only 11% of all patients in the study group. The principal triggering factors known to the patients were dust (in 78%) and upper respiratory tract infections in 67%, Cold air 41%, Work environment 9%, Animal dander 21%, Plants 18%. About 46% of the patients did not use preventers (in the form of steroid inhalers or tablets) regularly when prescribed. Most patients in the study (88%) used inhalers for treatment of asthma attacks whereas 12% were reluctant to use inhalers. About 44% of asthmatic patients tried non-medical methods for the purpose of cure.
A cross-sectional survey conducted in Lusaka, Zambia, over a 9-month period, from July 2011 to March 2012. Data were collected from 1,540 participants, age was 30.7 years and 65 % were female. The most frequent asthma symptoms reported were wheezing (n = 102: 88 %) and waking up at night with either shortness of breath (n = 99: 85 %), chest tightness (n = 99: 85 %), or cough (n = 78: 67 %). Medications used to treat asthma in male and female individuals, respectively were oral short-acting beta-agonists (SABA): [71.1 % vs. 53.9 % p = 0.006], antihistamines (7.7 % vs. 20.8 % p = 0.11), oral steroids (7.7 % vs. 15.6 % p = 0.199), theophylline (5.2 % vs. 22.4 % p = 0.06) and antibiotics (35.9 % vs. 33.8 % p = 0.528). Just over seventy-six percent of the surveyed population understood that inhalers were good treatment for asthma, shortness of breath a sign of asthma (92.2), tightness in the chest a sign of asthma (90.5), Is a cough at night a sign of asthma (56.9), Is wheezing after exercise a sign of asthma (91.4) Asthma cannot be cured. (68.1), an inhaler is a good treatment for Asthma (72.4), People with asthma cannot exercise or play hard. (57.8), Asthma is a common reason for many school absences. (58.6), when asthma attacks stop, you don’t have asthma anymore. (13.8), Asthma symptoms can be prevented with the right medications (54.3), when a person has an asthma attack they should see a doctor immediately. (89.7), People can become addicted to inhalers for asthma treatment. (43.1), Tablets are better than inhalers for asthma treatment (45.7).55

A cross sectional study conducted in Aseer Central Hospital June 2007. 171 mothers of asthmatic children were interviewed in the study. The ages of their asthmatic children ranged from 3–11 years with a mean of 6.3years. They included 58 males (33.9%) and 113 females (66.1%) result: Symptoms of bronchial asthma Wheeze (100.0%), Cough (84.8%) Feeling of tightness in chest (57.9%) Shortness of breath (48.5%) Mechanisms of bronchial asthma. A high proportion of mothers (84.4%) did not know the mechanism by which bronchial asthma occurs, Inflammation leading to obstruct bronchi (10.5%), narrowing in bronchi (9.4%). Mothers recognized Aggravating factors of bronchial asthma Common cold (94.7%), Weather changes (82.5%) Exhaustion (46.2%), Dust (43.3%), Smoke (29.2%), Food (19.3%), Muscular exercise (11.1%) all mothers (100%) gave the necessary medications regularly, removed aggravating factors from the house (92.4%).86
A cross sectional analytic study conducted in Abu Dhabi July 2012, to assess the knowledge, attitude and practice of patients with asthma with respect to their disease and to examine their skills in using inhaled medications. A sample of 100 patients age >18 years known asthmatic; each patient responded to a structured questionnaire. Male 54%, female 46%, result: knowledge about symptoms cough 100%, wheeze 77%, difficult breathing 91%. Triggering factors, acute respiratory infections 86%, perfumes 87%, weather changes 49%, exercise 24%, smoke 35%. Action effective in controlling asthma avoid triggering factors 64%, using medications as advised 33%. How to behave if there are symptom of asthma, go to health facility 87%. About 59% of the patients believe that inhaled therapy is habit forming, can cause adverse effect 24%, do not control symptoms 14%. About 5% of asthmatic patients tried non-medical methods (traditional) for cure. 87

In a cross-sectional study conducted in Wad Medani, Sudan in 2005, aimed to determine the prevalence and risk factors and triggering factors of Asthma among basic school children, which found than the prevalence ranging from 1-30%. And asthma was more common in the age group 10-14 years and among males than females, they also found that the triggering factors were dust, cold air, bats, exercise and smoke respectively. 88
Chapter Three

Methods and Materials

Study design:
Across sectional, descriptive and community-based study.

Study Area:
The study carried out in Alwehda health center in Gezira south locality, Gezira state, in Sudan. To assess environmental factors related to asthma. Alwehda lies about 11 kilos south to Wad Medani town. The catchment area of health center borders, North Barakat about 1 kilo, South Altakala 500 meter, East Helat Abass about 2 kilos. The population of the catchment area about 8,000 most of them are famers and employee and most of them work in Wad Medani. The area is of low and medium socio economic status tribe commonly Kawahla and other tribes, there are 4 primary schools 2 girl and 2 boys, 2 secondary school 5 mosques.

The Health Center:
The health center provide PHC cervices. Consist of reception hall, clinic for medical officer, a laboratory, 1 recovery, Number or working staff 14, 2 doctors; 1 medical 1 family doctor, 1 medical assistance, 1 dental doctor, 1 lab technician, 1 lab assistant,1 pharmacy assistance, 3 nurse, 2 midwifes, 1 vaccinator and 1 nutritionist.

Population of study:
Patients of Asthma below 18 years and parents of asthmatic children living in Elwehda village.

Inclusion criteria:
This study included children of asthma below 18 years diagnosed as having asthma in Elwehda village of different, sex and tribe. A previous Study was done in the area above this age.

Exclusion criteria:
The study not include patients above 18 years.

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Sample size:

This study was done by total coverage for all asthmatic patients under 18 years and resides in Elwehda village, according to the registration on the health center medical records.

Sample technique:

Health center record taken, and asthmatic children below 18 years determined, Then their location in the village was identified and were they live then trained health workers was selected for home visits researcher reached some of the registered asthmatic patients in their homes in , while others attended the health center, as the method was total coverage.

Data collection:

The data for this study was collected by 4 trained health workers they interview the participants through modified designed questionnaire covering the socio demographic information including age, sex, level of education in addition to information about the knowledge, attitude and practices of participants about asthma.

Data processing and analysis:

All data was entered and stored on a personal computer and analyzed using the Statistical Package for Social Sciences (SPSS version 20). General descriptive analysis was used.

Ethical consideration:

Approval from ethical committee, verbal consent from participants after informing them about the objectives of the study, confidentiality of results and no interference with any ongoing management.
Chapter Four

Results

Table 1: Age statistics among asthmatic children in Elwehda village, n=160

<table>
<thead>
<tr>
<th>N</th>
<th>Range</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>160</td>
<td>16</td>
<td>1</td>
<td>17</td>
<td>8.73</td>
</tr>
</tbody>
</table>

Table 2: Demographic characteristics distribution among asthmatic children in Elwehda village, n=160

<table>
<thead>
<tr>
<th>Age groups</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-3</td>
<td>15</td>
<td>9.4</td>
</tr>
<tr>
<td>4-6</td>
<td>45</td>
<td>28.1</td>
</tr>
<tr>
<td>7-9</td>
<td>30</td>
<td>18.8</td>
</tr>
<tr>
<td>10-12</td>
<td>35</td>
<td>21.9</td>
</tr>
<tr>
<td>13-15</td>
<td>22</td>
<td>13.8</td>
</tr>
<tr>
<td>15-17</td>
<td>13</td>
<td>8.1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Gender</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>97</td>
<td>60.6</td>
</tr>
<tr>
<td>Female</td>
<td>63</td>
<td>39.4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Educational level</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-school</td>
<td>57</td>
<td>35.6</td>
</tr>
<tr>
<td>Primary</td>
<td>88</td>
<td>55.0</td>
</tr>
<tr>
<td>Secondary</td>
<td>15</td>
<td>9.4</td>
</tr>
<tr>
<td>Total</td>
<td>160</td>
<td>100.0</td>
</tr>
</tbody>
</table>
Figure 1: Family history status of Asthma among asthmatic children in Elwehda village, n=160

Table 3: Natural history of the disease among asthmatic children and their parents in Elwehda village, n=160

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>Life time disease</td>
<td>110</td>
<td>68.8</td>
<td>50</td>
</tr>
<tr>
<td>Continue till certain age</td>
<td>123</td>
<td>76.9</td>
<td>37</td>
</tr>
</tbody>
</table>
Table 4: Food allergy status among asthmatic children and their parents in Elwehda village, n=160

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>60</td>
<td>37.5</td>
</tr>
<tr>
<td>No</td>
<td>100</td>
<td>62.5</td>
</tr>
<tr>
<td>Total</td>
<td>160</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Figure 2: Type of Asthma first diagnosis among asthmatic children and their parents in Elwehda village, n=160
Table 5: Knowledge about Asthma definition among asthmatic children and their parents in Elwehda village, n=160

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>Disease of bronchi</td>
<td>155</td>
<td>96.9</td>
<td>5</td>
</tr>
<tr>
<td>Lead to difficulty of breathing</td>
<td>157</td>
<td>98.1</td>
<td>3</td>
</tr>
<tr>
<td>Is a chronic illness</td>
<td>70</td>
<td>43.8</td>
<td>90</td>
</tr>
<tr>
<td>Not curable</td>
<td>103</td>
<td>64.4</td>
<td>57</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>485</td>
<td>303.2</td>
<td>155</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td>121.25</td>
<td>75.8</td>
<td>38.75</td>
</tr>
</tbody>
</table>

Table 6: Knowledge about causes of Asthma among asthmatic children and their parents in Elwehda village, n=160

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>Genetic factors</td>
<td>133</td>
<td>83.1</td>
<td>27</td>
</tr>
<tr>
<td>Due to bad behavior</td>
<td>60</td>
<td>37.5</td>
<td>100</td>
</tr>
<tr>
<td>Environmental factors</td>
<td>131</td>
<td>81.9</td>
<td>29</td>
</tr>
<tr>
<td>Economical factors</td>
<td>37</td>
<td>23.1</td>
<td>123</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>361</td>
<td>225.6</td>
<td>279</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td>90.25</td>
<td>56.4</td>
<td>69.75</td>
</tr>
</tbody>
</table>
Table 7: Knowledge about signs of Asthma among asthmatic children and their parents in Elwehda village, n=160

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>Cough that increases at night and early morning</td>
<td>142</td>
<td>88.8</td>
<td>18</td>
</tr>
<tr>
<td>Shortness of breath</td>
<td>158</td>
<td>98.8</td>
<td>2</td>
</tr>
<tr>
<td>Wheezing</td>
<td>155</td>
<td>96.9</td>
<td>5</td>
</tr>
<tr>
<td>Tiredness with efforts</td>
<td>115</td>
<td>71.9</td>
<td>45</td>
</tr>
<tr>
<td>Recurrent of chest infection</td>
<td>129</td>
<td>80.6</td>
<td>31</td>
</tr>
<tr>
<td>Total</td>
<td>699</td>
<td>437</td>
<td>101</td>
</tr>
<tr>
<td>Average</td>
<td>139.8</td>
<td>87.4</td>
<td>20.2</td>
</tr>
</tbody>
</table>
Table 8: Knowledge about triggering factors of Asthma among asthmatic children and their parents in Alwehda village, n=160

<table>
<thead>
<tr>
<th>Triggering Factor</th>
<th>Yes</th>
<th>No</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>House dust</td>
<td>157</td>
<td>98.1</td>
<td>3</td>
</tr>
<tr>
<td>Smoke</td>
<td>153</td>
<td>95.6</td>
<td>7</td>
</tr>
<tr>
<td>Some types of plants and flowers</td>
<td>110</td>
<td>68.8</td>
<td>50</td>
</tr>
<tr>
<td>Perfumes</td>
<td>125</td>
<td>78.1</td>
<td>35</td>
</tr>
<tr>
<td>Cold weather</td>
<td>130</td>
<td>81.3</td>
<td>30</td>
</tr>
<tr>
<td>Animals and their products</td>
<td>122</td>
<td>76.3</td>
<td>38</td>
</tr>
<tr>
<td>Health exercises and sports</td>
<td>106</td>
<td>66.3</td>
<td>54</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>903</td>
<td>564.5</td>
<td>217</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td>129</td>
<td>80.64</td>
<td>31</td>
</tr>
</tbody>
</table>
Table 9: Practice in case of Asthma attack among asthmatic children and their parents in Elwehda village, $n=160$

<table>
<thead>
<tr>
<th>Practice</th>
<th>Yes</th>
<th>No</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>Go away from triggering factor</td>
<td>153</td>
<td>95.6</td>
<td>7</td>
</tr>
<tr>
<td>Open windows</td>
<td>143</td>
<td>89.4</td>
<td>17</td>
</tr>
<tr>
<td>Seek medical advise</td>
<td>142</td>
<td>88.8</td>
<td>18</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>438</td>
<td>273.8</td>
<td>42</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td>146</td>
<td>91.27</td>
<td>14</td>
</tr>
</tbody>
</table>

Table 10: Type of chemotherapy used among asthmatic children and their parents in Elwehda village, $n=160$

<table>
<thead>
<tr>
<th>Chemotherapy</th>
<th>Yes</th>
<th>No</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>Antihistamine</td>
<td>100</td>
<td>62.5</td>
<td>60</td>
</tr>
<tr>
<td>Antibiotics</td>
<td>95</td>
<td>59.4</td>
<td>65</td>
</tr>
<tr>
<td>Ventolin orally or inhaler</td>
<td>133</td>
<td>83.1</td>
<td>27</td>
</tr>
<tr>
<td>Steroids orally or inhaler</td>
<td>108</td>
<td>67.5</td>
<td>52</td>
</tr>
</tbody>
</table>
Figure 3: Ever use of traditional medication for Asthma among asthmatic children and their parents in Elwehda village, n=160

Table 11: Use of Ventolin inhaler among asthmatic children in Elwehda village, n=160

<table>
<thead>
<tr>
<th>Item</th>
<th>Yes</th>
<th>No</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>Correctly used</td>
<td>139</td>
<td>86.9</td>
<td>21</td>
</tr>
<tr>
<td>Not lead to habituation</td>
<td>39</td>
<td>24.4</td>
<td>121</td>
</tr>
<tr>
<td>Control the symptoms</td>
<td>110</td>
<td>68.8</td>
<td>50</td>
</tr>
<tr>
<td>Not lead to immunity deficiency</td>
<td>67</td>
<td>41.9</td>
<td>93</td>
</tr>
<tr>
<td>Total</td>
<td>355</td>
<td>222</td>
<td>285</td>
</tr>
<tr>
<td>Average</td>
<td>88.75</td>
<td>55.5</td>
<td>71.25</td>
</tr>
</tbody>
</table>
Table 12: Thinking about Asthma contagiousness among asthmatic children and their parents in Elwehda village, n=160

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>55</td>
<td>34.4</td>
</tr>
<tr>
<td>No</td>
<td>105</td>
<td>65.6</td>
</tr>
<tr>
<td>Total</td>
<td>160</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Figure 4: Positive or negative smoking status among asthmatic children in Elwehda village, n=160
Table 13: Type of fuel used in cooking among asthmatic children and their parents in Elwehda village, n=160

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gas</td>
<td>106</td>
<td>66.3</td>
</tr>
<tr>
<td>Charcoal</td>
<td>35</td>
<td>21.8</td>
</tr>
<tr>
<td>Wood</td>
<td>19</td>
<td>11.9</td>
</tr>
<tr>
<td>Total</td>
<td>160</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 14: Home animal husbandry status among asthmatic children and their parents in Elwehda village, n=160

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>90</td>
<td>56.3</td>
</tr>
<tr>
<td>No</td>
<td>70</td>
<td>43.8</td>
</tr>
<tr>
<td>Total</td>
<td>160</td>
<td>100.0</td>
</tr>
</tbody>
</table>
Figure 5: Site of animal yard among asthmatic children and their parents in Elwehda village, n=160

Table 15: Site of waste disposal among asthmatic children and their parents in Elwehda village, n=160

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burn beside home</td>
<td>37</td>
<td>23.1</td>
</tr>
<tr>
<td>Throwaway</td>
<td>19</td>
<td>11.9</td>
</tr>
<tr>
<td>Waste cart</td>
<td>104</td>
<td>65.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>160</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>
Table 16: Practice towards pesticides, poultry farms and brick ambushes among asthmatic children and their parents in Alwehda village, n=160

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>Using masks</td>
<td>114</td>
<td>71.3</td>
<td>46</td>
</tr>
<tr>
<td>Closing windows</td>
<td>124</td>
<td>77.5</td>
<td>36</td>
</tr>
<tr>
<td>Staying at home</td>
<td>107</td>
<td>66.9</td>
<td>53</td>
</tr>
<tr>
<td>Total</td>
<td>345</td>
<td>215.7</td>
<td>135</td>
</tr>
<tr>
<td>Average</td>
<td>115</td>
<td>71.9</td>
<td>45</td>
</tr>
</tbody>
</table>
Chapter Five
Discussion, Conclusion and Recommendations

Discussion

Asthma is a common chronic inflammatory disease of the airways characterized by variable and recurring symptoms, reversible airflow obstruction, and bronchospasm. Common symptoms include wheezing, coughing, chest tightness, and shortness of breath. This study was done to assess the knowledge attitude and practice of patients and parents of asthmatic children about asthma in Alwehda health Centre in Alwehda village, south of Gezira locality, Gezira state, Sudan. It was a cross sectional, descriptive and community-based study. Patients of Asthma below 18 years and their parents were included with a total sample of 160 participants. The results found that they were aging from 1 to 17 years with a mean age of \((8.7 \pm 4.26)\), the most frequent age group was 4-6 with 45 (28.1%), and the lowest one was 15-17 with 13 (8.1%). Males were 97 (60.6%), while females were 63 (39.4%), this finding matches the findings of Hussein SE study. Most of them were in primary school 88 (55.0%), preschool were 57(35.6%) and only 15 (9.4%) were in secondary school. 121 (75.8%) were knowledgeable about definition of asthma, while 39 (24.2%) were not. 78 (48.8%) of the participants were diagnosed as asthmatic by clinical examination, those who were diagnosed by lung function test were 9 (5.6%), and only 5 (3.1%) were diagnosed by blood test. 112 (70.0%) of the patients had Asthma family history, while 48 (30.0%) had not. Regarding the fade of asthma 110 (68.8%) of them reported that asthma is a life time not curable disease similar to finding of Gajanan, 90 (56.4%) were knowledgeable, while 70 (43.6%) were not knowledgeable, this is near to the results found by Zhao, J. Concerning the knowledge about causes of asthma study revealed that 133(83.1%) know that asthma is hereditary and this result is better than that of Amani k and Tanique -Hakim et al. Concerning About signs of asthma, 142 (88.8%) define cough as a sign, 158 (98.8%) stated that shortness of breath as a sign, 155 (96.9%) reported wheezing as a sign, 115 (71.9%) tiredness as a sign these results better than that found by Gajanan and near to result found by Ibrahim
Mohamed et al\textsuperscript{87}, about precipitating factors of asthma 129 (80.6\%) stated that recurrent of chest infection as triggering factors-, these results were near to study of Ibrahim Mohamed et al\textsuperscript{87}, 129 (80.6\%) were knowledgeable about triggering factors of asthma, while 31 (19.4\%) were not knowledgeable. The most precipitating factors house dust 98\% and smoke 95\% opposite to study of A.M. Al Binali et al\textsuperscript{86} and Ibrahim Mohamed et al\textsuperscript{87}. Practice of participants in case of asthmatic attacks -was correct in 146 (91.3\%), while it was not correct in 14 (8.7\%), seek medical advice 88.8\% and this result is better than that of Gajanan\textsuperscript{83} and similar to that of Emilia J.M \textsuperscript{85} and Ibrahim Mohamed et al\textsuperscript{87}. Avoid triggering factors 95\% better than that study of Gajanan\textsuperscript{83}. Concerning the practice of patients towards the chemotherapy, those who use antihistamine were 100 (62.5\%), while those who use antibiotics were 95 (59.4\%), and those use Ventolin were 133 (83.1\%), those who use steroids were 108 (67.5\%), this is near the results found by Amani K. Abu-Shaheen\textsuperscript{82}. Half of the patients had had a bad attitude towards management of asthma; they at least took traditional medication for asthma once, while the other half did not ever took a traditional medication, this is near to the results of Tarique H.M.\textsuperscript{84}, and opposite to that of Ibrahim Mohamed et al\textsuperscript{87}. About the practice of using Ventolin inhaler, 89 (55.5\%) had correct practice; and 71 (44.5\%) were not. 105 (65.6\%) were think that asthma contagiousness, this result goes with that of Tarique H.M.\textsuperscript{84}. More than one-third 60 (37.5\%) of the participants had food allergy; while the rest had not. 73 (45.6\%) were either positive or negative smokers. Two-thirds 106 (66.3\%) of the participants were using gas for cooking, while 35 (21.8\%) were using charcoal and 19 (11.9\%) were using wood. Ninety (56.3\%) had animals at home, while 70 (43.8\%) had not. From those who had animals at home, 52 (32.5\%) their animal were inside home, 20 (12.5\%) outside home, while only 18 (11.2\%) were having their animals outside the village. 104 (65.0\%) were using the waste cart in waste disposal, 37 (23.1\%) were burning it beside their houses, and 19 (11.9\%) were just throwing it away. Concerning practice towards environmental factors such as pesticides, poultry farms and bricks ambushes, 115 (71.9\%) had a good practice, while 45 (28.1\%) had not good practices.
Conclusion

- The level of knowledge towards Asthma was (75.8%) in parents of asthmatic children below 18 years old and their caretakers.
- The knowledge of parents of asthmatic child about the causes of asthma was (56.4%), poor knowledge about causes, and types of medical treatment used by them was mostly Ventolin inhaler or steroids while some of them used either antibiotics or antihistamine.
- Attitude of parents of asthmatic patients towards risk factors was correct in (71.9%).
- The practice of parents of asthmatic patients towards asthmatic attacks was correct in (91.3%).
**Recommendations**

- Promotion of educational programs conducted by health care providers for the patient and his family regarding Asthma and how to take medication correctly.
- Encourage parents and asthma patients for more regular visits to health center.
- Raise awareness at the health center by counseling people with positive family history.
- Using the waste cart in waste disposal and prevent burning of waste near houses with provide containers instead of scatter garbage by locality support.
- Prevent charcoal production inside the village near houses by notifying the authority.
- Further researches are essential to strengthen the quality of Asthma service provided to patients.
Reference

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Annex 1

University of Gezira - Faculty of medicine

Department of family and community medicine

Knowledge Attitude and Practice of patients and parents of asthmatic children, about Asthma in Elwehda village in south of Gezira locality, Gezira states Sudan (2017)

This is a questionnaire to understand the knowledge and attitudes of patients and parents towards asthma in Elwehda village in the south of Gezira locality, Gezira state, Sudan.

You will be asked to answer these questions with 'Yes' or 'No'.

You have the freedom to answer some questions or not. Please sign in case of agreement.

Number:............................ Age:............................ Gender:............................

1. What is asthma:
   a) No ( )
   b) Yes ( )

2. It causes difficulty in breathing
   a) No ( )
   b) Yes ( )

3. It is a chronic disease
   a) No ( )
   b) Yes ( )

4. There is no treatment for asthma
   a) No ( )
   b) Yes ( )

   I don’t know

2. How was the initial diagnosis of your case:
   a) Through a medical examination. ( )
   b) Through the medical history of the family. ( )
   c) Through tests to determine lung health. ( )
   d) Through blood tests. ( )

3. Do you have any asthma cases in your family?
   a) Yes ( )
   b) No ( )

4. What is the natural history of asthma:
   a) Full recovery from the disease. ( )
   b) Continues until a specified age. ( )
   c) I don’t know

5. What are the reasons for asthma in your opinion:
   a) Inherited reasons ( )
   b) Behavioral reasons ( )
   c) Environmental reasons. ( )
   d) Economic reasons. ( )

   I don’t know
6/ أي من هذه العلامات قد تدل على مرض الأزمة ـ:
1. سعال مستمر يزيد ليلاً في الصباح الباكر
   أ/ نعم ( )   ب/ لا ( )
2. ضيق في التنفس
   أ/ نعم ( )   ب/ لا ( )
3. صوت صغير في الصدر
   أ/ نعم ( )   ب/ لا ( )
4. الارتجاج الشديد عند بذل مجهود
   أ/ نعم ( )   ب/ لا ( )
5. التهاب الجهاز التنفسي المتكرر
   أ/ نعم ( )   ب/ لا ( )

7/ أي من هذه العوامل يساعد في تهييج الربو في رأيك ـ:
1. الاتربة والغبار
   أ/ نعم ( )   ب/ لا ( )
2. الدخان
   أ/ نعم ( )   ب/ لا ( )
3. بعض أنواع الأعشاب والنباتات
   أ/ نعم ( )   ب/ لا ( )
4. العطور
   أ/ نعم ( )   ب/ لا ( )
5. البرد الشديد
   أ/ نعم ( )   ب/ لا ( )
6. الحيوانات ومخاطاتها
   أ/ نعم ( )   ب/ لا ( )
7. الانتشار البدني والرياضة العنيفة
   أ/ نعم ( )   ب/ لا ( )

8/ في حالة الشعور بنبوة الأزمة ماذا تفعل ـ:
1. الابتعاد عن عوامل التهيج
   أ/ نعم ( )   ب/ لا ( )
2. فتح النوافذ وتجديد الهواء
   أ/ نعم ( )   ب/ لا ( )
3. البحث عن مساعدة طبية
   أ/ نعم ( )   ب/ لا ( )

9/ هل العلاج الكيميائي (الأدوية) في حالة نوبة الأزمة مهمة بالنسبة لديك وماذا تستخدم ـ:
1. استخدام الانتستين
   أ/ نعم ( )   ب/ لا ( )
2. استخدام مضادات حيوية
   أ/ نعم ( )   ب/ لا ( )
3. استخدام بخاخ أو حبوب فنتولين
   أ/ نعم ( )   ب/ لا ( )
4. استخدام حبوب أو بخاخ الاستيرود
   أ/ نعم ( )   ب/ لا ( )

10/ هل سبق أن استخدمت العلاجات البديلة أو الأعشاب ـ:
1. في حالة استخدام بخاخ الفنتولين
   أ/ نعم ( )   ب/ لا ( )
2. هل يتم استخدام البخاخ استنادا صحيحا
   أ/ نعم ( )   ب/ لا ( )
3. هل استخدام النافذة يؤدي إلى التهيج
   أ/ نعم ( )   ب/ لا ( )
4. هل يؤدي إلى السيطرة على الأعراض
   أ/ نعم ( )   ب/ لا ( )
5. هل يؤدي الى نقص المناعة
   أ/ نعم ( )   ب/ لا ( )

11/ هل الربو مرض معد
1. هل يوجد لديك حساسية ضد بعض الرطويات ـ:
   أ/ نعم ( )   ب/ لا ( )
2. هل أنت مدخن أو معالج للتدخين السلبي ـ:
   أ/ نعم ( )   ب/ لا ( )
3. هل معرض من الفيروسات
   أ/ نعم ( )   ب/ لا ( )
15/ مانوع الوقود المستخدم في المنزل :
أ/ نعم (    )    ب/ لا (      )
1. الغاز
2. الفحم
3. الحطب

16/ هل لديكم حيوانات بالمنزل
أ/ نعم (    )    ب/ لا (      )

17/ مكان الحظائر :
أ/ نعم (    )    ب/ لا (      )
1. داخل المنزل
2. خارج المنزل
3. خارج القرية

18/ كيف يتم التخلص من الأوساخ :
أ/ نعم (    )    ب/ لا (      )
1. الحرق قرب المنزل
2. رميها في الخارج
3. عربة القمامة

19/ ما هي ردة الفعل تجاه العبيدات التي تستخدم في المزارع القريبة ووجود مزارع الدواجن والكمائن :
أ/ نعم (    )    ب/ لا (      )
1. استخدام كمامات
2. اغلاق النوافذ
3. البقاء بالمنزل لمنع حدوث نوبة