

ST. PAUL'S HOSPITAL MILLENNIUM MEDICAL COLLEGE

DEPARTMENT OF PUBLIC HEALTH



**ASSESSMENT OF MAGNITUDE, RISK FACTORS, TREATMENT OPTIONS AND OUT
COMES OF ACUTE EXACERBATIONS OF BRONCHIAL ASTHMA AMONG
PATIENTS VISITING EMERGENCY DEPARTMENT IN SPHMMC/AaBET
HOSPITAL, 2018**

By

Bilisuma Mulisa (Intern)

Advisors Mr. Samson Zegeye (MPH)
Dr. Ashanafi (MD)

RESEARCH THESIS TO BE SUBMITTED TO THE DEPARTMENT OF PUBLIC HEALTH,
SPHMMC, IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF
DOCTOR OF MEDICINE

August, 2018
Addis Ababa, Ethiopia

ACKNOWLEDMENT

First of all, I would like to thank God for helping me from the beginning to the end. Next I would like to express my gratitude especially for my public health advisor Mr Samson and Dr. Ashanafi for taking their time and agreeing to advise me in the whole process of my research development. Last but not least I would also like to send my gratitude for my dorm mates and friends and also the staff of AaBET/SPHMMC who has been helping me by giving me advices and different materials while developing this research thesis.

ACRONYMS AND ABBREVIATIONS

AaBET: Addis Ababa Burn, Emergency and Trauma

ABG: Arterial Blood Gas

BBS: Bronchial Breath Sound

CBC: Complete Blood Count

CDC: Center for Disease Control

COPD: Chronic Obstructive Pulmonary Disease

EOPD: Emergency Out Patient Department

FMOH: Federal Ministry of Health

GBAR: Global Burden of Asthma Report

GINA: Global Initiatives for Asthma

HMIS: Health Management of Information System

ICS: Inhaled Corticosteroid

LABA: Long Acting Beta 2 Agonist

OCS: Oral Corticosteroids

SOB: Shortness of Breath

SPSS: Statistical Package for Social Sciences

SABA: Short Acting Beta 2 Agonist

URTI: Upper Respiratory Tract Infection.

WHO: World Health Organization

List of Tables and Figures

<u>Fig.</u>	<u>Page No.</u>
 Fig 1 Sign and symptom showed by respondents	21
 Fig 2 Severity of Bronchial Asthma.....	22
 Fig 3 Smoking status of patient of patients.....	22
 Fig 4 Acute Triggers for Asthma Exacerbation.....	23
 Fig 5 Pattern of Medication prescriptions.....	25
 Fig 6 Patterns of prescribed medications with severity of asthma.....	26

<u>List of Tables</u>	<u>Page No.</u>
✚ Table 1. Socio demographic characteristics of respondents	20
✚ Table 2. Physical Examination findings.....	24
✚ Table 3. Adjunctive Treatment	24
✚ Table 4. Comorbid Diseases.....	25
✚ Table 5. Outcome of the patient.....	26
✚ Table 6. Factors associated with severity of acute exacerbation of asthma...	27

Contents	
Acknowledgement	i
Acronyms and Abbreviation	ii
List of Tables and Figures.....	iii
1. Introduction	1
1.2. Statement of Problem	2
1.3. Justification of study	3
2. Literature Review.....	4
3. Objectives of study	7
4. Methods and Materials.....	8
4.1. Study area -	8
4.2. Study design-.....	8
4.3 Study Period-.....	8
4.4 Source population-	8
4.5. Study population-	8
4.6. Inclusion and exclusion criteria.....	9
4.7. Sample size determination and Sampling technique.....	9
4.8. Study Variables	9
4.9. Operational Definitions	10
4.10. Data collection Procedures.....	10
4.11. Data entry and Analysis	11
4.12. Ethical Considerations.....	11
4.13. Dissemination of Results.....	11
5. Results.....	12
5.1 Sociodemographic results	12
5.2 Magnitude of Bronchial Asthma.....	13
5.3 Sign and symptoms	13
5.4 Severity of Bronchial Asthma	14
5.5 Smoking status of patient	14
5.6 Acute Triggers for Asthma Exacerbation.....	15
5.7 Physical Examination.....	24
5.8 Patterns of Medication Prescription.....	25

5.9 Comorbid Diseases.....	17
5.10 Outcome of the patient	18
6. Discussion	19
7. Conclusion	22
9. Limitation and strength of the study	23
10. References	24
11. Annex:.....	27

Abstract

Back ground: Asthma is a chronic inflammatory disorder of the airways. Most asthma exacerbations can be prevented if management is comprehensive. Poorly managed asthma leads to emergency treatment and hospitalization. It imposes a large burden on individuals and health care systems so that periodic research on the prevalence and factors that lead patients to visit ER is mandatory for proper health care planning, management and prevention of the problem in order to reduce health care cost, morbidity and mortality thereby assuring productive citizens.

Objective: The objective of the study was to assess the prevalence, risk factors, treatment options and outcomes of acute exacerbations of bronchial asthma.

Methods: The study was cross sectional, retrospective document review. This study was carried out at AaBET/ SPHMMC Hospital Addis Ababa, Ethiopia from October, 2017 to March 2018 G.C. The Source population was all patients who visited EOPD of AaBET Hospital during study period.

The Study population is all adult patients who present with acute exacerbation of bronchial asthma and visited adult emergency department. All adult patients who visited EOPD of AaBET and diagnosed as a case of bronchial asthma during Study period were selected. The sampling technique was done by purposive sampling technique. No need of sampling technique because all patients visiting adult emergency room and diagnosed as asthma during the study period as taken the study sample. The required data were obtained by preparing a structured check list table. The data were obtained from HMIS logbook of AaBET Hospital. Patients with the diagnosis of asthma were retrieved from HMIS log book, then the data were collected through gathering all medical records of patients with asthma who came in the study period. After the data was collected and the responses are coded, the data were entered into a computer and analyzed using SPSS. In the analysis process, frequency distribution of variables was worked out in order to describe them.

1. Introduction

1.1 Background

An estimated 300 million individuals are affected by asthma globally. WHO estimates that 15 million disability adjusted life years are lost and over 180 000 asthma related deaths are reported worldwide. It is estimated that 80% of asthma deaths occur in low and middle income countries (1). It is projected that by 2025 an additional 100 million people will have asthma. WHO estimates that asthma accounts for about 1 in every 250 deaths in the world. Asthma exacerbations can be associated with a variety of risk factors. Notably asthma exacerbations are associated with exposure to irritants such as cigarette smoke exposure and diesel exhaust fumes, inhalant allergens such as house dust mites, drugs known to worsen asthma, poor adherence/non-compliance to therapy, extremes in weather or temperatures, exercise, respiratory infections. (2)

The prevalence rates of asthma are found to be greatest in the United Kingdom (>15%) and Newzealand (15.1%). In Ethiopia, nationwide data addressing asthma prevalence in adult population is lacking. Report of community based studies done in Jimma showed 3.6 % prevalence of asthma. Another report in 2003 among school children from Gondar Town, Ethiopia showed a prevalence of 16.2%. The prevalence was as follows: Ethiopia 9.1%, Kenya 15.8%, Nigeria 13.0%, and South Africa 20.3%; and French-speaking regions: Algeria 8.7%, Morocco 10.4%, and Tunisia 11.9%. This could be due to the effects of increased urbanization and industrialization (6).

Asthma is a chronic inflammatory condition characterized by airway hyper responsiveness to a variety of stimuli largely of allergic origin with reversible airflow limitation. The major clinical features of asthma are wheezing, shortness of breath, and cough. It is a major cause of impaired quality of life with impact on work and recreational as well as physical activities and emotions.

The goal of treatment is to achieve overall clinical control, which entails the achievement of symptom-free control and to minimize future risks. The goal is the same for all severity of the disease (4).

Current control of asthma includes achievement of symptom relief, reduction in the use of on demand inhalers, improvement in activity, and improvement in lung function. Future risk minimization is achieved by ensuring the absence of asthma exacerbations, the prevention of accelerated decline in lung function over time, and no side-effects from medications.

The hallmark of asthma is a reduction in airway diameter brought about by contraction of smooth muscle, vascular congestion, edema of the bronchial wall, and thick, tenacious secretions. The net result is an increase in airway resistance, a decrease in forced expiratory volumes and flow rates, hyperinflation of the lungs and thorax, increased work of breathing, alterations in respiratory muscle function, changes in elastic recoil, abnormal distribution of both ventilation and pulmonary blood flow with mismatched ratios, and altered arterial blood gas concentrations. Virtually all aspects of pulmonary function are compromised during an acute attack (21).

Enormous advances have been made in the understanding and management of asthma in the past 20 years. These include; understanding the inflammatory nature of the disease, use of steroids, add-on of long acting bronchodilators to steroids, use of devices to deliver the medications more appropriately/conveniently, and appreciation of the value of self-management education (15).

In managing asthma, health-care providers and the patients are often faced with lots of challenges and these challenges of asthma management include challenges in diagnoses, challenges in the treatment, follow-up challenges, and other general challenges (19).

1.2. Statement of Problem

WHO estimates that asthma accounts for about 1 in every 250 deaths in the world, many of which are preventable. The deaths are mostly attributed to long term sub optimal therapy and delay in obtaining help in acute attacks (2). Studies have shown that damage of the airway epithelium as a result of deleterious effects of uncontrolled asthma, predisposes to respiratory tract infections such as pneumonia.

Chronic respiratory diseases represent a public health challenge in both industrialized and developing countries because of their frequency and economic impact.

In developing countries, poverty and non-communicable respiratory disease have long been linked. Asthma is a major cause of chronic morbidity and mortality worldwide and represents a substantial economic and social burden throughout the world (22).

Most patients have poor access to health care; this is even true of the poorest minorities in industrialized countries. In developing countries, however, an additional problem is that health planners have limited resources (23).

Asthma is an important and increasing public health problem in Africa which receives inadequate priority and attention. About 235 million people worldwide suffer by non-communicable diseases. The cause of asthma is not well understood but effective medicines are available that can treat it. Unfortunately for many people with asthma, particularly for the poor, this effective treatment is too costly or not available at all (9).

According to the CDC (center for disease control) report, 10-11 million persons had acute attacks in which results in 13.9 million outpatient visits, 2 million requests for urgent care and 423,000 hospitalizations (12). There are many factors that lead patients to visit the ED. The most common reported factors include asthma severity, poor compliance, the inappropriate use of inhalers and incorrect perceptions about asthma as a disease (14). Most of the asthma medications prescribers do not follow asthma management guidelines in many Low and Medium Income Countries. The research done in Uganda in 2012 shows only 32.2% of patients diagnosed with asthma receives recommended medications according to the international asthma management. (20)

This will directly influence and bring about for the miss management of the diseases. It might be due to in availability of the drugs, in ability to afford, limited trainings of health professionals about the management of bronchial asthma according to international guide line.

1.3. Justification of study

Asthma is a common condition that affects 5-10% of the population. The incidence and prevalence of asthma have increased during the past 20 years. A study conducted in Addis Ababa, Black Lion Referral Hospital 2015; the prevalence of bronchial asthma was 1.04 which was low but different literature shows that asthma increases in urban area. (15)

Taking all this problem in to consideration to decrease the severity and recurrence of asthma and improve treatment outcomes, this study is aimed to know the prevalence, frequent exacerbations with their respective management guideline options and results.

1.4 Significance of the Study

This study will add knowledge on understanding of the prevalence and factors that lead to emergency. In addition, the study may provide base line information about prevalence of asthma and it may be important for researchers who are interested.

The data obtained in this study may have its own contribution for policy makers, clinicians for planning and evaluating the management of asthma. It is also expected to assess and promote national asthma management guideline utilization in relation to levels of asthma control.

2. Literature Review

Global situations

Bronchial asthma is a major cause of morbidity and mortality and WHO estimates globally, 300 million are suffering with bronchial asthma with approximately 25,000 asthma related annual death (11).

The global initiative for asthma (GINA) estimates that the global prevalence of asthma ranges from 1 to 18% of total population of different countries. Though the prevalence and incidence of asthma is difficult to assess with certainty because of lack of reliable population based figures which used uniform diagnostic criteria, however, it has been suggested that approximately 5% of adult in USA and Australia have the disorder (12).

There was a study conducted in Portugal on Prevalence of asthma which states that the prevalence of 'Diagnosed asthma' was 5.0% (95%CI 4.2 -5.8) and the 'Lifetime asthma' prevalence was 10.5% (95%CI 9.5-11.6). In those with 'Lifetime asthma', 72.8% had their first asthma attack before 18 years old, 25.5% between 19 and 64 years old and 1.7% after 65 years old. Prevalence was similar in men and women and in all age and the study done in the Kingdom of Saudi Arabia in 2001, the prevalence of asthma was 12%. (24)

While in Malaysia, 73% outpatient clinic attendants are treated for respiratory symptoms and asthma is one and major cases. It is estimated that there is 1.6 to 2 million asthmatics in Malaysia and the second Malaysian health and morbidity conducted in 1996, had showed that the prevalence of asthma among the general population of Malaysia was 4.6 % in children and 4.1% in adults respectively.

It also revealed that 9.9% and 2.7% of asthma cases were moderate and severe forms, that required hospitalization, respectively. (25) There was a cross-sectional study from 2007-2009 in Malaysia in orang Asli area showed that 1.2 % of prevalence in adults and (1.7%) in children. with regard to gender, it is slightly higher in females (1.7%) while (1%) in males. (25)

In a study carried in New Zealand to compare regular versus on-demand inhaled bronchodilator therapy, regular inhalation of beta sympathomimetic agent was associated with deterioration of asthma control. Another study was carried out to compare the effectiveness of a β_2 agonist; terbutaline and ICS; budesonide in managing newly diagnosed asthma. The findings revealed that budesonide was more superior to terbutaline. (25)

Asthma management guidelines provide recommendations for the optimal control of asthma. Adherence to asthma guidelines can improve compliance and patient care which in overall results in improved patient outcomes.

African situations

There was systematic analysis done on an estimate of asthma prevalence in Africa estimated that a prevalence of 11.7% for asthma, totaling over 74 million people in 1990, and our 2010 prevalence was 12.8%, about 120 million people. all the above result indicates the prevalence is significant.

From studies based on written questionnaires, “asthma ever” (cumulative prevalence of asthma) was highest in South Africa (53%, 5-12 years) in 1997, followed by Egypt (26.5%, 11-15 years) in 2005, Nigeria (18.4%, 15-35 years) in 1995, and Ethiopia (16.3%, >20 years) in 1997. The lowest prevalence was recorded in Gambia (1.9%, >15 years) in 1997. (9)

However, from all studies, the pooled crude prevalence (weighted means) for “current wheeze” was 13.2% (male 10.8%, female 13.1%, mean age 18.4 years), and “asthma ever” was 6.6% (male 6.7%, female 6.3%, mean age 22.9 years). The study indicated that crude prevalence were consistently higher among urban dwellers than rural dwellers. “Current wheeze” was 9.6% (male 12.1%, female 7.0%, mean age 19.6 years) in urban settings and 7.0% (male 5.5%, female 3.8%, mean age 17.5 years) in rural settings. “Asthma ever” prevalence was 5.9% (male 5.6%, female 3.9%, mean age 22.9 years) and 5.1% (male 4.2%, female 3.1%, mean age 17.5 years) in urban and rural dwellers, respectively. (9)

There was a research done in Uganda on march 2012 on the proportion of asthma and pattern of asthma medication and the result showed that at the accident and emergency department four hundred and sixteen (416) patients out of 16 800 (2.5%) were diagnosed with asthma. Sixty-nine point seven (69.7%) were female. The median age was 29 years.

Wheezing was the commonest presenting symptom (55%). Recommended asthma therapy prescriptions were 32.2% of the patients at A&E department received asthma therapy prescriptions as recommended for asthma exacerbations management during hospitalization.

The result tells us there is a gap in following the international asthma management guide lines. The recommendation given was there should be training on management of asthma for health professionals and local guide line on asthma management should be developed. (20)

A literature review done in Nigeria on challenges of asthma management also indicated a high cost and unavailability of ICS as a major obstacle for adequate asthma management. Similar findings were reported from Uganda and Ethiopia. (7)

According to the 'Kenya national asthma guidelines', drugs used to treat asthma are classified into 2 groups: Relievers (bronchodilators) and controllers (anti-inflammatory drugs). The relievers are used on an 'as-needed' basis to promptly reverse broncho-constriction and relieve symptoms. Oral salbutamol is commonly used in Kenya as it is cheap and widely available. It has however been associated with frequent and severe side effects such as palpitations and tremors. (26)

Ethiopians situations

The study conducted in Ethiopia in 1997, the prevalence was 16% in adults (>20years) (9) but there was a decline in prevalence in study conducted by global initiative for asthma in 2003 that shows the prevalence of asthma on adults (>20 years) was 4%. Asthma prevalence was noted to be low in rural, subsistence areas, and higher in the urban areas in the same countries. (4)

In south west Ethiopia asthma accounted for 2% of outpatient and 5.4% medical admission (12). A cross-sectional study done in Jimma to assess asthma control on asthmatic patients attending chest clinic of Jimma University Specialized Hospital, reported only 9 subjects (3.8%) using ICS (19) while similar study done in TASH indicated about 76% ICS use (27).

3. Objectives of study

3.1. General objectives

- To assess the magnitude, risk factors, treatment options and outcomes of acute exacerbations of bronchial asthma.

3.2 Specific objectives

- To assess the magnitude of patients with acute exacerbation of bronchial asthma
- To identify risk factors for acute exacerbation of bronchial asthma
- To determine patient's response to available methods of treatment
- To identify available means of treatment

4. Methods and Materials

4.1. Study area - The study was conducted in Addis Ababa which is the capital city of Ethiopia. AaBET (Addis Ababa Burn Emergency Medicine and Trauma) Hospital is an Affiliate of St. Paul's Millennium Medical College. It is located at Arada sub city, near to Yohannes church, around Arat Menta. St. Paul's Hospital was built by Emperor Haile Selassie I in 1969 with the help of the German Evangelical Church. It was aimed to help the poor. A medical College was formed in 2007. It has 1200 clinical and non-clinical staff with 350 beds and for catchment population of more than 5 million. A medical school, the Millennium Medical College was opened in 2007 to commemorate the new millennium era of Ethiopia.

The school was established by the Ethiopian Ministry of Health with Professor Gordon Williams of the department of urology at the Hammersmith Hospital in London, its first dean. By considering flow of patients and to provide qualified service especially for Burn, Emergency and Trauma patients St. Paul's hospital built its branch two yrs. before in July 15, 2015 G.C as AaBET hospital. Which stands for Addis Ababa Burn, Emergency and Trauma ("AaBET").

Now the hospital AaBET has a total of 535 staffs with 256 nurses. It divided its area into emergency, burn unit, ICU, Pedi orthopedics, Neuro surgical, adult Orthopedics, general observation and OPD follow up rooms. The hospital has 158 beds of which 34 beds are in Emergency department.

4.2. Study design- The study design was cross sectional, retrospective document review.

4.3 Study Period- The study was carried out at AaBET/SPHMMC Hospital, Addis Ababa, Ethiopia, from October, 2017 to March 2018 G.C.

4.4 Source population- All patients who visited EMOPD of AaBET during study period.

4.5. Study population- All adult clients who presented with acute exacerbation of bronchial asthma and visited adult emergency department.

4.6. Inclusion and exclusion criteria

Inclusion criteria

➤ All adult (age greater than 13 years of age) patients with bronchial asthma who Visited adult Emergency Department of AaBET Hospital will be included.

Exclusion criteria

- Patients with diagnosis of Chronic Bronchial Asthma without exacerbation
- Patients having Bronchial Asthma as Comorbidity

4.7. Sample size determination and Sampling technique

4.7.1 Sample size determination

All adult patients who visited EOPD of AaBET and diagnosed as a case of bronchial asthma during Study period will be selected.

4.7.2 Sampling technique and procedure

The sampling technique were by Convenience sampling technique. No need of sampling technique because all patients visiting adult emergency room and diagnosed as asthma during the study period were taken as the study sample.

4.8. Study Variables

4.8.1 Dependent Variables:

- Status of Patients with acute exacerbation of Bronchial Asthma: severity, triggering factors, outcome

4.8.2 Independent variable

- Socio-demographic characteristics: Age, Sex, Occupation, Residence, Educational level, smoking habits
- Disease characteristics: sign and symptoms, comorbidity, use of asthma medications, allergy,

4.9. Operational Definitions

- **Asthma:** is a chronic inflammatory diseases of the air ways characterized by variable and recurring symptoms, reversible air way obstruction and bronchospasm (4).
- **Acute Exacerbations of Bronchial Asthma:** are episodes of progressive increase in shortness of breath, cough, wheezing, chest tightness, or a combination of these symptoms (4).
- **Mild asthma,** if the speech is in sentences, not use accessory muscle, respiratory rate is in 12 to 20, heart rate is in 60 to 100, oxygen saturation is $\geq 95\%$.
- **Moderate asthma,** if the speech is in phrases, mental status is agitated, sometimes use of accessory muscle, respiratory rate is in 20 to 30, heart rate is in 100 to 120, oxygen saturation is in 90% to 95%.
- **Severe asthma,** if the speech is in words, mental status is decreased, using of accessory muscle, respiratory rate is >30 , heart rate is >120 , oxygen saturation $<90\%$

4.10. Data collection Procedures

4.10.1 Methods of data collection

First patients with the diagnosis of asthma were retrieved from HMIS log book, then the data were collected through gathering all medical records of patients with asthma who came in the study period. Structured questionnaire, adopted from relevant literatures & previous studies developed for similar purposes. The data were collected by the researcher and by other assistant, clinical year medical student, after given a proper training.

4.10.2 Data Quality and Clearance

In ensuring the quality of data, all the data for each patient were checked for completeness, accuracy, clarity and consistency by the principal investigator, immediately after data was collected. Care on questionnaire design by principal investigator and checked all questionnaires (on regular basis) for completeness. Those data which are undocumented on the patient's charts are taken as unknown as reference reported on the other researches.

4.11. Data entry and Analysis

After the data collected and the responses are coded, the data were entered into a computer and analyzed using SPSS Version 21. In the analysis process, frequency distribution of variables was worked out in order to describe them. To ascertain the association between dependent and independent variables, odds ratio with 95% confidence interval were calculated.

4.12. Ethical Considerations

The ethical approval and clearance were obtained from Department of Public Health, SPHMMC. The necessary explanation about the purpose of the study and about its procedure, assurance of confidentiality was obtained.

4.13. Dissemination of Results

The findings of this study will be distributed to different organizations that have helped the project to be carried out; the findings will be presented in different seminars, meetings and workshops and may be published in scientific journals.

5. Results

5.1 Sociodemographic results

From the total of 134 patients retrieved from HMIS log book, 121 patients fulfill the eligibility criteria. From these 53 (43.8%) were males and 68(56.2%) were female giving a male to female ratio of 0.77 to 1.0.

From the study of age group found in the age class of 34-43 years and 54-63 that accounts 37(30.6%) and 32(26.4%) respectively. Only 4 (3.3%) patients found in the age class of 14-23 years. The mean age of the patient was 41.88 and standard deviation 11.5.

With regard to their residency 95(78.5%) were urban and 26(21.5%) were rural. With regard to ethnicity, 83(68.5%) were unknown, 21(17.4%) Amhara's, 11(9.1%) Oromo's, 4(3.3) SNNPR, and 1(0.8%) were Tigrinya's. Most of the patient's occupation status is unknown 101(83.5%), unemployed 10(8.3%), Trader's and gov't employees each 3(2.5%). Similarly regarding religion 88(72.7) are unknown, 23(19.0%) orthodox, 7(5.8%) Muslim's, and 2(1.7%) Protestants. The marital status of 100(82.6%) were unknown, 20(16.5%) were married.

Table 1. Socio demographic characteristics of Patients, 2018

Characteristic		Frequency	Percentage
Age	14-23	4	3.3
	24-33	20	16.5
	44-53	37	30.6
	54-63	26	21.5
	54-63	32	26.4
	>63	2	1.7
Sex	Male	53	43.8
	Female	68	56.2
Residency	Urban	95	78.5
	Rural	26	21.5
Ethnicity	Oromo	11	9.1
	Amhara	21	17.4
	Tigre	1	0.8
	SNNPR	4	3.3
	Unknown	84	69.4
Religion	Orthodox	23	19.0
	Muslim	7	5.8
	Protestant	2	1.7
	Others	1	0.8
	Unknown	88	72.7

Occupation	Farmer	1	0.8
	Trader	3	2.5
	Government employee	3	2.5
	Unemployed	10	8.3
	Self employed	2	1.7
	Others	1	0.8
	Unknown	101	83.5

5.2 Magnitude of Bronchial Asthma

The total patients who visited adult Medical emergency department of AaBET/ SPHMMC from OCT- 1 -2017 to MAR-1-2018 were 8208; from this 134(1.63%) patients were diagnosed with bronchial asthma.

5.3 Sign and symptoms

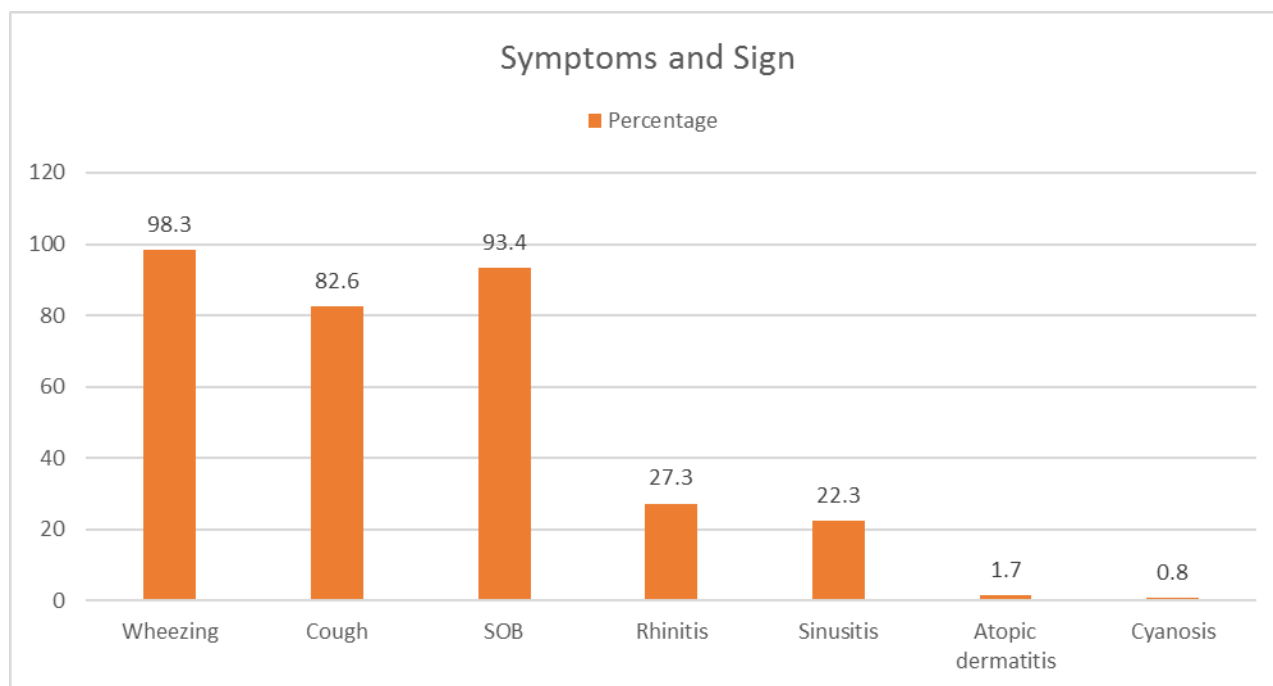


Fig. 1 Sign and symptoms, 2018

5.4 Severity of Bronchial Asthma

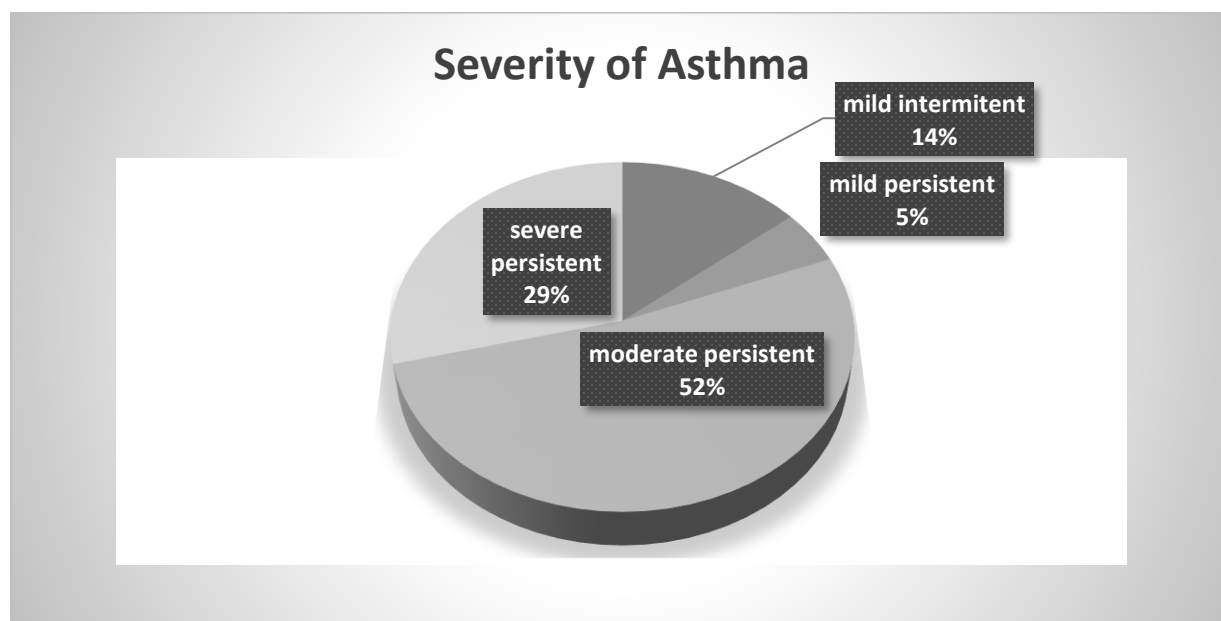


Fig 2 Severity of Bronchial Asthma, 2018

5.5 Smoking status of patient

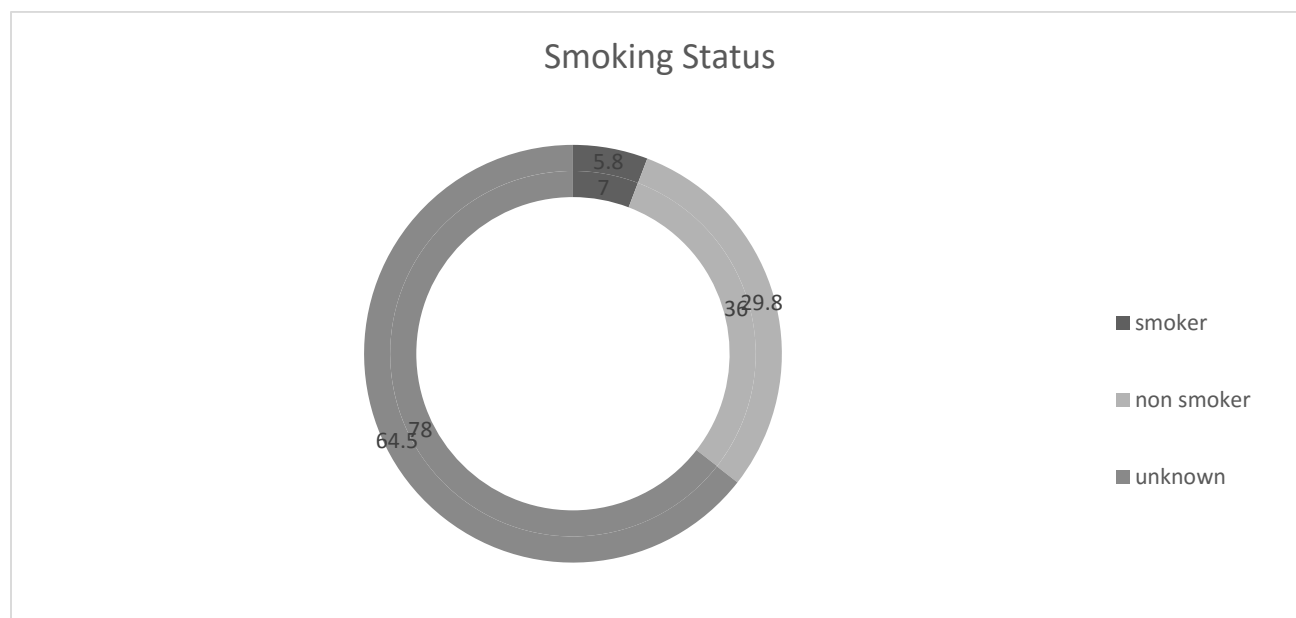


Fig 3 Smoking status of patients, 2018

5.6 Acute Triggers for Asthma Exacerbation

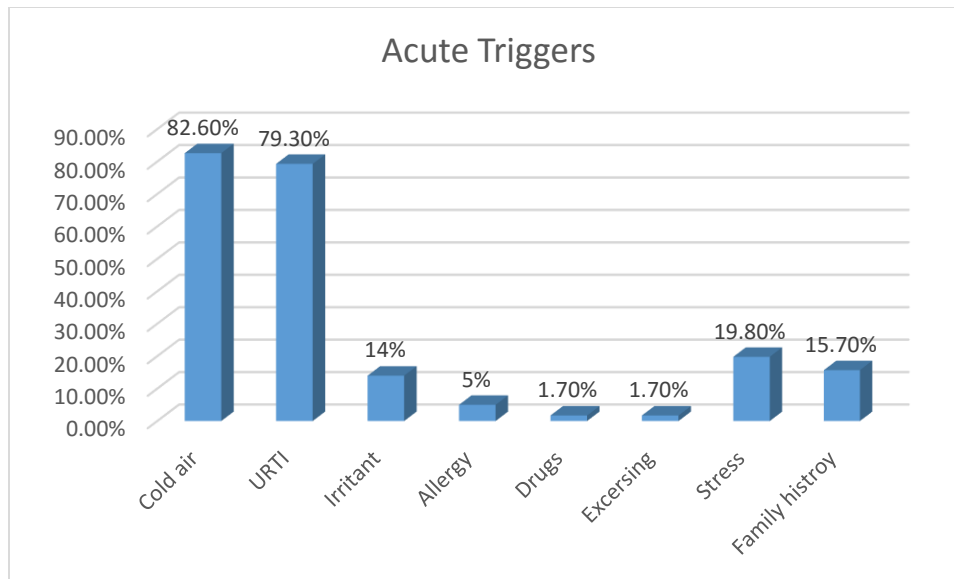


Fig 4 Acute Triggers for Acute Exacerbations of Bronchial Asthma, 2018

5.7 Physical Examination

Table 2. Physical Examination findings, 2018

<i>Characteristic</i>		<i>Frequency</i>	<i>Percentage</i>
<i>Pulse rate</i>	80-100	51	42.1
	101-120	62	51.2
	>120	7	5.8
	<60	1	0.8
<i>respiratory rate</i>	16- 20	15	12.4
	21-30	103	85.1
	>30	2	1.7
	<16	1	0.8
<i>Spo2</i>	>90	13	10.7
	80-89	63	52.1
	70-79	35	28.9
	<70	10	8.3
<i>Mental status</i>	Comatose	1	0.8
	agitated	5	4.1

distressed	72	59.5
stable	43	35.5

Table 3 WBC and Chest Findings of patients, 2018

Characteristic		Frequency	Percentage
WBC	> 12000	50	41.3
	4000-12000	56	46.3
	unknown	15	12.4
Wheezing	yes	121	100.0
BBS	yes	70	57.9
Decreased air entry	yes	75	62.0

5.8 Pattern of Medication prescriptions

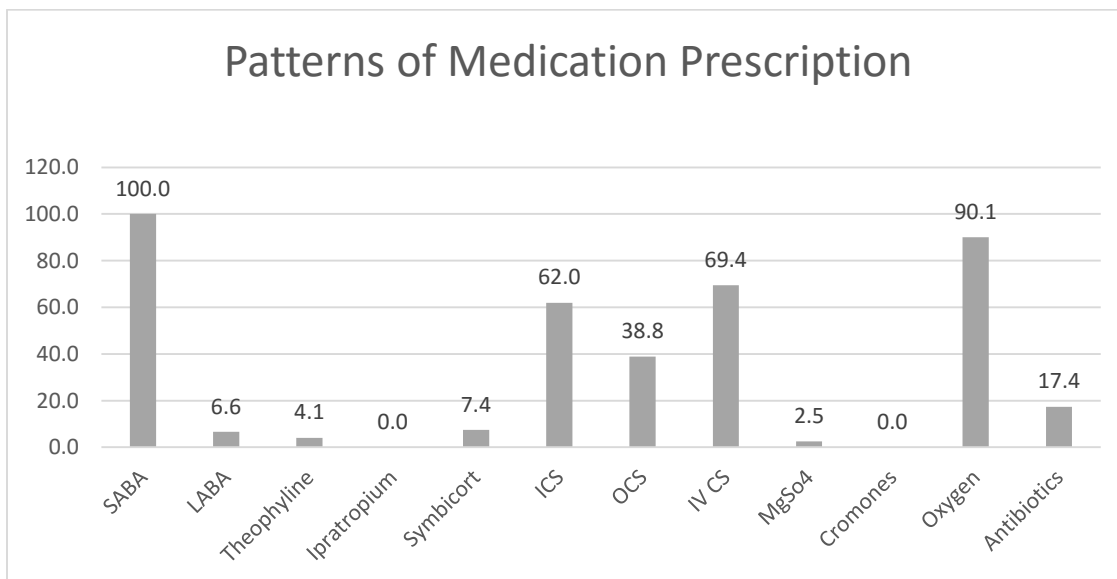


Fig 5 Pattern of Medication prescriptions, 2018

5.8.1 Adjunctive Treatment

Table 4. Adjunctive Treatment for supportive therapy, 2018

Characteristic		Frequency	%
Oxygen	yes	109	90.1
Antibiotics	yes	21	17.4

5.8.2 Patterns of prescribed medications with severity of asthma

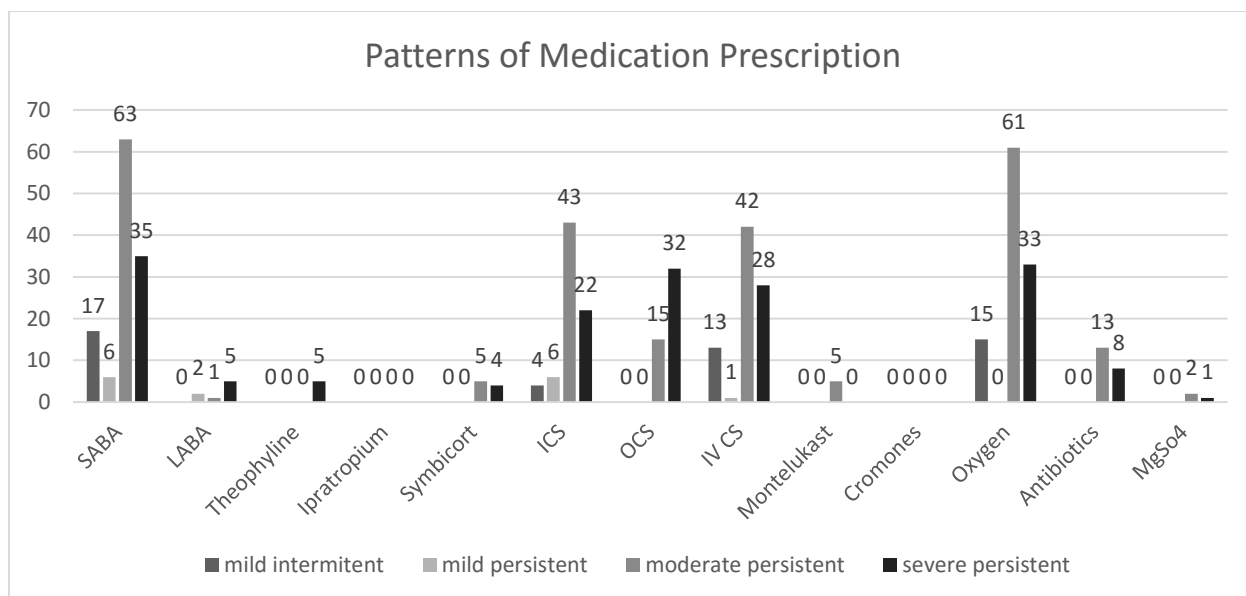


Fig 6 Patterns of prescribed medications with severity of asthma, 2018

5.9 Comorbid Diseases

Table 5. Comorbid Diseases, 2018

Characteristic	Frequency	%
CAP	10	8.3
HTN	6	5
CHF	6	5
unknown	35	28.9

No comorbidity	64	52.9
----------------	----	------

5.10 Outcome of the patient

Table 6. Outcome of the patient, 2018

Characteristic	Frequency	%
Improved	118	97.5
Died	3	2.5

6. Discussion

The male to female ratio was 0.77 to 1.0. Which shows the prevalence with regard to sex is almost the same. There was a research done in Portugal which support this finding where females (57.3%) and male (42.7%) [28]. There was also a study done in Malaysia form 2007-2009 which shows it was slightly higher in females. [25]. Most of the age group are found in the age interval of 34-43, and 54-63, totally that account 57.0%. There was a study done in Zewditu Memorial hospital which was 46.6% % in this age groups [29]. The research done in Egypt in 2015 showed that most belonged to 20–29 years' age group. This might be due to geographical and occupational variability between the countries.

The result showed that the prevalence of acute exacerbation of bronchial asthma is 1.63%. The research done in Zewditu Memorial hospital in 2017 and in Tikur Anbessa Specialized Hospital in 2015 is 1.5% and 1.04% respectively. (15) The Global Initiative for Asthma (GINA) estimates that the global prevalence of asthma ranges from 1 to 8% of the total population of different countries. (4). This finding is relatively low from that of a research conducted in Indian adults on prevalence and risk factors for bronchial asthma which was 2.38%. This may be due to that India is highly industrialized than Addis Ababa. It has been suggested that the higher prevalence rates observed among females could partly be due to their smaller airway caliber size.

The WHO estimates the prevalence as 1.5 % for Ghana compared to 0.3% for Greece and 2.8% for Wales and New Zealand (1). There was systematic analysis done on an estimate of asthma prevalence in Africa estimated that a prevalence of 11.7% in 1990, and in 2010 prevalence was 12.8% (9). A study done in Uganda in 2010 showed 2.5% were diagnosed with asthma. A lower number of prevalence in this study may be due to incompleteness of Patient 's chart that were excluded in the study, and a number of patients might be treated and managed in the nearby health institution.

According to my study most frequently encountered symptoms are wheezing, dyspnea and cough. As it is seen from the result the most dominant symptoms are wheezing, dyspnea and cough. This finding similar to results that of Zewditu Memorial hospital in 2017, which was 90.8 % had wheezing, 85% had dyspnea and 80.8 % had cough and in Tikur Anbessa Specialized Hospital in 2015, (91.9%) had wheezing, (88.5%) had breathing trouble, (84.5%) had cough. (15).

This study finding is relatively comparable with the study conducted in Madrid, Spain in 2014 the major symptom and sign seen among those diagnosed with asthma was dyspnea (90.5%), cough (78%), and wheezing (43%). (30)

Most of the patients visiting adult emergency department 82.6% had cold air as triggering factor, 79.3% has URTI, 5% had allergy. The findings correlate with symptomatic presentation of patients. This finding is comparable with the research done in Madrid, Spain in 2014, 59% had respiratory infection, 8% had respiratory allergy and 28% have unknown triggers.

The study done in the national referral hospital in Kampala, Uganda in the 2012 was also comparable which was 67.4% had rainy weather as triggering factor, and 55.8% had URTI. (31) Upper respiratory tract infections were significant as a risk factor for exacerbations in this study. This is consistent with a study by Nicholson et al which found that URTI/Viral infections are the cause of an exacerbation in about 65% of adults with asthma (32). For my study 15.7% had family history of asthma while the research done in JUSH, Jimma in 2012 showed 26.1%.

The data for evaluation of severity of exacerbation of asthma is comparable to the research done in Tikur Anbessa Hospital in 2015, which revealed 43.9% moderate, 41.9% were mild, and 14.2% severe. Such clinical classification based on the severity of exacerbation of asthma is very important to decide whether the patient can be managed at home or needs to be hospitalized or he/she is to be admitted to an intensive care unit with or without ventilator support and also such analysis of severity of exacerbation of asthma enables the clinician to select appropriate therapy. In contrast to this study, in Bangalore, India 2012 a research done revealed, highest number of patients with moderate severity (53%) followed by mild (30%) and severe (17%). (10). According to GINA, Severity of asthma according to Global Initiative for Asthma classification 34.4% were mild persistent, 33.6% moderate persistent and 32.1% severe persistent.

Physical examination revealed that most were tachycardic, tachypneic, and were desaturating. All study subjects had diffuse wheezing up on auscultation. Comparable with the research done in Madrid, Spain in 2014, Physical examination revealed 33.5% were tachycardic, 26.8% were tachypneic, wheezing in 77% of cases and absent breath sounds in only 25 patients. And baseline oxygen saturation <92% was observed in 31% of patients. The difference in the studies may be attributed to that patients in our set up present after they were seen and failed to properly respond at local clinics.

The results of this study showed that most of the patients received combination therapy when compared with individual therapy regarding patterns of medication. From this study finding all patients were given Salbutamol, the main reason for its use is rapid onset and low cost. In addition, salbutamol does not increase exacerbation rates and provides instant symptomatic relief and those who were diagnosed with mild asthma, 17 were prescribed SABA, 4 took ICS, 13 get parenteral corticosteroid and 15 patients were supplemented with oxygen.

Comparable to this study, study done in Tikur Anbessa Hospital showed low dose inhaled SABA were 78(52.7%), medium dose inhaled SABA, 64(43.2%), high dose inhaled SABA, 5(3.4%), systemic CS, (65.5%), oxygen 122(84.4%), and adjective therapy 34(23.0%). The study done in Saudi Arabia in 2017 showed, that maximum number of patients (78.9%) were prescribed beta-agonists, Salbutamol, 7.89% Anticholinergics, (5.26%) Methylxanthines, (21.84%) Steroids alone, (4.21%) Leukotriene Modifiers, (13.16%) Miscellaneous. (33).

In Egyptian study done in Bengaluru in 2015, the most commonly prescribed inhaled bronchodilator was salbutamol with ipratropium bromide (87%) followed by formoterol with budesonide (26%) which was in coherence with the study done in Malaysia in which salbutamol was the most commonly prescribed (34) and also study done in Bareilly, which showed inhaled salbutamol was received by 100% of the patients irrespective of the severity.

In contrast to my study, study done in Jimma specialized hospital in 2016 showed that 24% had comorbidity. (19). The study done in Bangalore, India revealed that n co-morbid conditions associated with asthma were allergic rhinitis 46% followed by gastro-oesophageal reflux disease (GERD)29%. (10). From the 121 studied patients 118(97.5) were improved and discharged and 3(2.5%) died. The death might be due to severity of asthma and comorbid factors. The risk estimation of smoking status of the patient with the outcome can't be computed because of most of the patients smoking status is unknown. This finding is comparable to the research done in ZMH in 2017, which showed 96.7% had improved and discharge to home and Only 3.3% of the studied subjects died. (29)

7. Conclusion

There was a low prevalence of bronchial asthma in emergency compared to most African countries and slightly higher than some European countries, with slight difference in sex with female predominance. The prevalence was high in age group of 34-43 and 54-63. Majority of the patients with asthma were urban dwellers. Wheezing, cough and dyspnea were the predominant symptoms and signs seen in the study. Most patients came to emergency due to trigger with cold air, URTI and exposure to different allergens. Up on presentation in emergency most patients were tachycardic, tachypneic and desaturating. Most patients with acute exacerbation were classified as moderate persistent asthma. Most of the patients received combination therapy and all patients took salbutamol. The outcome of nearly all patients were good.

8. Recommendation

- ✓ FMOH should provide on the means of reduction of the burden of acute exacerbation of bronchial asthma.
- ✓ Patients should be advised by treating physician to avoid most commonly triggering factors for the exacerbation.
- ✓ Proper chart documentation and thorough patient assessment should be done by all physicians.
- ✓ The available treatment modalities should be carried out for all patients by all health professionals.

9. Limitation and Strength of the study

- ✓ The data of patients which are undocumented on the patient's charts were taken as unknown, there were difficulty in finding symptoms, associated factors and the management given for patient due to lack of proper documentation.
- ✓ It may not be generalized beyond the study population, and applies for patients with only acute exacerbations.
- ✓ The study provides mode of the acute presentation with its clinical, laboratory, physical examination and each patient's medical management.

10. References

1. World Health Organization: Asthma fact sheet no.307: Updated November [Online]. Available from: <http://www.who.int/mediacentre/factsheets/fs307/en/>
2. Braman SS. The global burden of asthma. *CHEST Journal*. 2006; 130(1_suppl):4S–12S.
3. National Institute of Health. Expert panel report-3: Guideline for the diagnosis and management of asthma [Online]. [2007] [cited 2013 Nov 29]. Available from: <http://www.nhlbi.nih.gov/guidelines/asthma>.
4. Masoli M, Fabian D, Holt S, Beasley R. Global Initiative for Asthma program: The global burden of asthma: Executive summary of the GINA dissemination committee report. *Allergy* 2004; 59: 469–478.
5. T, Stanojevic S, Moores G, Gershon AS, Bateman ED, Cruz AA, et al. Global asthma prevalence in adults: Findings from the cross-sectional world health survey. *BMC Public Health* 2012; 12: 204.
6. Pearce N, Ai't-Khaled N, Beasley R, Mallol J, Keil U, Mitchell E, et al. Worldwide trends in the prevalence of asthma symptoms: phase III of the International Study of Asthma and Allergies in Childhood (ISAAC). *Thorax* 2007; 62:758–766.
7. Onyedum CC, Ukwaja KN, Desalu OO, Ezeudo C. Challenges in the Management of bronchial asthma among adults in Nigeria: A systematic review. *Annals of Medical and Health Sciences Research* 2013; 3 (3): 324-29.
8. Joshua a Lawson, a Jansen and William picket, asthma incidence and risk factor in a national longitudinal sample of adolescent Canadians, prospective cohort studies, bio med central pulmonary medicine, march 6,2014
9. Davies adeloye, kit yee chaigor vudan and harry compel, an estimate of asthma prevalence in Africa, *Croatian medical jornal*, dec2013; 54(6), 519-531
10. A,N.aggarwal ,K.Chaudhury, S.K.chabra, prevalence and risk factor for bronchial asthma in Indian adults, *Indian journal of chest disorder allied science* 2006;48;13 -22

11. A S Amoah, A G Forson, and D A Boakye, a review of epidemiological studies of asthma in Ghana, Ghana medical journal, v.46, 23-28, jun 2012
12. Demeke, Andualem, Mossie, clinical effects of yoga on asthmatic patients, Ethiopian journals of health science, VOL 20, no.2, July 2010.
13. Neil Pearce, David Strachan, The global asthma report, 2011.
14. Hamdan Al-Jahdali, Ahmed Anwar, Salim bathrooms, factors associated with patients visit to the emergency department for asthma therapy, BMC, PUL.MED,2012,12;80.
15. Mulat Tadele: assessment of prevalence and patterns of medication prescription for bronchial asthma at adult emergency room of Tibur Anbesa Specialized Hospital, 2015.
16. Arumugam V, Preeti K, Vijay J, et al. Drug Utilization Assessment in Asthma Therapy through Prescription Monitoring at Dehradun Hospitals. Indian J Allergy Asthma Immunol 2008;22(1):15-18.
17. Emerman CL, Cydulka RK. Behavioral and environmental factors associated with acute exacerbation of asthma. Ann Allergy Asthma Immunol. 1998;81(3):239-42. Epub 1998/10/06.
18. Gamble J, Stevenson M, McClean E, Heaney LG. The prevalence of nonadherence in difficult asthma. Am J Respir Crit Care Med. 2009;180(9):817-22. Epub 2009/08/01.
19. Zemedkun, Woldemichael, Tefera, Assessing control of asthma in JUSH, Jimma South west Ethiopia 2012
20. JB Kirenga and M Okot-Nwang The proportion of asthma and patterns of asthma medications prescriptions among adult patients in the chest, accident and emergency units of a tertiary health care facility in Uganda. Journals of African health science, Mar 2012; 12(1): 48–53. PMCID: PMC3462518
21. Bruce Pearson R. Natural history of asthma. Allergy. 1958;12(4-5):277–94.
22. Alt-Khald, Nadia Enarson, Omald Bousquet, Jean, Chronic respiratory disease in developing countries: the burden and strategies for prevention and management; Bulletin of the world health organization vol.79, 2011.
23. S Musafri, G Joos, and J P van meerbeeck, asthma, atopic, and COPD in sub-Saharan countries; challenges, African journal of respiratory medicine, vol.7, no 1, sep 2011.

24. Abdulaziz Al-Mazam, and Ashry G. Mohamed, Dr. PH, risk factors of bronchial asthma in bah rah, Journals of Family and Community Med. 2001 Jan-Apr; 8(1): 33–39.
PMCID: PMC3437065
25. R Ngui, Y A L Lim, S C Chow, J A de bruyn, prevalence of bronchial asthma among orang asli in peninsular malaysia, medical journal Malaysia, 20 march 2011, VOL 66
26. Division of Leprosy, Tuberculosis & Lung Disease, 2011. Guidelines for Asthma Management in Kenya-2011.
27. Chalachew T, Ephrem E, Tola B. Adequacy of Asthma Management among patients attending chest clinic of Tikur Anbessa Specialized Hospital. Master's Thesis. Addis Ababa University; 2013. Available from: Pharmacy Library, College of health science, Addis Ababa University.
28. Ana Sa-Sousa, Mário Morais-Almeida, and João Almeida Fonseca, Prevalence of asthma in Portugal - The Portuguese National Asthma Survey, BIO MED CENTRAL, Clin Transl Allergy. 2012; 2: 15.
29. Sisay F. Assessment of the prevalence of asthma and factors that lead patients to visit adult emergency room of Zewditu Memorial Hospital, Addis Ababa, Ethiopia, and 2017 GC.
30. Pola-Bibian B, Dominguez-Ortega J, Vilà-Nadal G, González-Cavero L Asthma Exacerbations in a Tertiary Hospital: Clinical Features, Triggers, and Risk Factors for Hospitalization; J Investig Allergol Clin Immunol ;2017
31. Richard E Sanya, Bruce J Kirenga, William Worodria, Martin Okot-Nwang Risk factors for asthma exacerbation in patients presenting to an emergency unit of a national referral hospital in Kampala, Uganda. African Health Sciences Vol 14 Issue 3, September 2014
32. Nicholson KG, Kent J, Ireland DC. Respiratory viruses and exacerbations of asthma in adults. BMJ. 1993;307(6910):982-6. Epub 1993/10/16.
33. MM Rafeeq, HAS Murad Evaluation of Drug Utilization Pattern for Patients of Bronchial Asthma in a Government Hospital of Saudi Arabia; Nigerian Journal of Clinical Practice, 2017
34. Basavaraju Th, Praveen P, A retrospective study on drug utilization in patients with acute exacerbation of bronchial asthma in adults at a tertiary teaching hospital in Bengaluru, Egyptian Journal of Chest Diseases and Tuberculosis, 2016

20. Mental status A. Comatose B. Agitated C. Distressed D. Conscious
21. Severity A. Mild Intermittent B. Mild persistent
 C. Moderate Persistent D. Severe persistent

4. Acute Triggers

- A. cold air A. yes B. no
- B. URTI A. yes B. no
- C. Irritants A. yes B. no
- D. Allergens A. yes B. no
- E. Drugs A. yes B. no
- F. Exercise A. yes B. no
- G. Stress A. yes B. no
- H. Smoking A. yes B. no
5. Do you have family history of asthma? A. yes B. no
6. Pulmonary function test of the patient A. Normal B. Abnormal C. Not done
7. WBC count of the patient A. >12000 B. <4000 C. 4000-12000
8. Chest findings of the patient A. diffuse wheezing B. BBS C. decreased air entry D. Normal
9. No of hospital admission of the patient A. once B. twice C. three times D. four &more

10. Pattern of medication given;

22. *Bronchodilators*

- A. SABA
- B. LABA
- C. Theophylline
- D. Anticholinergic (Ipratropium)

23. *Anti-inflammatory*

- A. ICS B. OCS C. parenteral CS D. Antileukotrienes E. Cromones

24. Adjunctive

A. Oxygen B. Antibiotics C. Analgesics D. others

25. ICU Admission A. yes B. no

26. MgSo4 A. yes B. no

27. Intubation A. yes B. no

28. Presence of comorbidity

A. CAP B. HTN C. DM D. CHF E. UTI F. others

29. Presence of complications

A. Pneumothorax B. Atelectasis C. Cor-pulmonale D. Respiratory failure

E. Subcutaneous Emphysema F. none G. not known

30. Outcomes

A. Improved

B. Died