



St. Paul Hospital Millennium Medical College Graduate Study Program

Level of Asthma Control and Associated Factors among Asthmatic Adult Patients who Attended Saint Paul's hospital millennium medical college (SPHMMC) Chest Clinic of Addis Ababa, Ethiopia, 2023.

Principal investigator: Yadesa Asfaw

Addis Ababa, Ethiopia

July 2023



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Table 1:St. Paul Hospital Millennium Medical College Graduate Study Program Research project submission Template

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Abstract

Background: The goal of asthma treatment is to obtain and maintain a good control of symptoms. Investigating factors associated with uncontrolled asthma could help in strategies to improve asthma control. There are a few studies in this field that examine the level of asthma control using validated questionnaires like the Asthma Control Test.

Objective: to determine the prevalence and factors associated with asthma control in asthma patients under St. Paul hospital millennium medical college chest clinic Addis Ababa Ethiopia.

Methods: A cross-sectional study was conducted from March 2023 to May 2023. Systematic random sampling technique was used to take a total of 284 asthma patients.

Physician-diagnosed asthma patients aged 18 years and above were included. A structured questionnaire was used to collect demographic data, comorbidities, and medical history of asthma. Asthma control was assessed using the standardized and validated Asthma Control Test, with a score cut points of less than 20 for uncontrolled asthma and a score greater or equal to 20 for well controlled asthma. A multivariate analysis was used to identify factors associated with uncontrolled asthma.

Results: Overall, 281 patients were included in this study with 98.94% response rate. Asthma was controlled in 80(28.5%) patients and uncontrolled in 201 (71.5%). The mean duration of asthma was 22 ± 14.8 years. One hundred sixty (56.9%) patients were under controller medication while the mean ACT score was 16.81 ± 3.43 . Independent associations were found between uncontrolled asthma and separated/divorced/widowed (AOR 6.62695% CI 1.251 – 35.084, $p = 0.026$), comorbidity (AOR 6.208, 95% CI 2.149-17.937, $p < 0.001$), irregular chest clinic follow up (AOR 9.918, 95% CI 3.575-27.512, $p < 0.001$), inappropriate MDI technique (AOR 3.546, 95% CI 1.393-9.028, $p < 0.001$), and taking SABA + ICS and ICS + LABA asthma medication (AOR .017, 95% CI .003-.087, $p < 0.001$, AOR .047, 95% CI .011-.201, $p < 0.001$) was less likely to develop uncontrolled asthma when compared to patient who took SABA only.

Conclusion: Asthma remains poorly controlled in a large proportion of asthma patients under SPHMMC chest clinic. Educational programs for asthma patients targeting comorbidity management, regular follow-up and appropriate Metered dose inhalation technique may help in improving the control of asthma.

Key words: asthma control, chest clinic, Asthma control test, Metered dose inhalation

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Table of Contents

Abstract.....	i
Acknowledgement	ii
Table of Contents.....	iii
List of Table.....	v
Abbreviations and acronyms.....	vii
1. Introduction.....	1
1.1. Back ground.....	1
1.2. Statement of the problem	3
1.3. Significance of the study.....	4
2. Literature review	5
2.1. General concepts of asthma	5
2.2. Asthma control among asthmatic patient.....	5
2.3. Associated factors of uncontrolled asthma	9
2.4. Conceptual framework.....	10
3. Objectives	11
3.1. General objective	11
3.2. Specific objective.....	11
4. Methodology	12
4.1. Study setting.....	12
4.2. Study design.....	12
4.3. Study period	12
4.4. Source population	12
4.5. Study population	12
4.6. Inclusion criteria	13
4.7. Exclusion criteria	13
4.8. Sample size determination	13
4.9. Sampling technique.....	13
4.9.1. Study variables.....	14
4.9.2. Instruments.....	14
4.10. Data collection and procedure.....	15
4.11. Operational definition	16

4.12.	Data quality control and management.....	16
4.13.	Data analysis plan and procedure.....	16
4.14.	Ethical consideration.....	17
4.15.	Dissemination of results.....	17
5.	Result	18
5.1.	Sociodemographic characteristics.....	18
5.2.	Asthma related and other clinical characteristics of participants	19
5.3.	Treatment related factors and Current Medications Taken by Asthma Patients.....	21
5.4.	Level of asthma control based on the Asthma Control Test (ACT).....	23
5.5.	MDI steps and technique among individuals with asthma.....	26
5.6.	Association factors of uncontrolled asthma	27
6.	Discussion	31
6.1.	Conclusion	33
6.2.	Recommendation	34
7.	Reference	35
	Annex I: English questionnaires	44
	Annex 2: Amharic questionnaires.....	1

List of Table

TABLE 1:ST. PAUL HOSPITAL MILLENNIUM MEDICAL COLLEGE GRADUATE STUDY PROGRAM RESEARCH PROJECT SUBMISSION TEMPLATE	III
TABLE 2: SOCIO- <i>DEMOGRAPHIC</i> AND CLINICAL INFORMATION OF ASTHMA PATIENTS WHO ATTENDED CHEST CLINIC UNDER SPHMMC IN ADDIS ABABA, ETHIOPIA 2023(N = 281)	18
TABLE 3: COMORBIDITY RELATED FACTORS AMONG ASTHMA PATIENTS WHO ATTENDED CHEST CLINIC UNDER SPHMMC IN ADDIS ABABA, ETHIOPIA 2023(N = 281).	19
TABLE 4: TREATMENT RELATED FACTORS AND ASTHMA TRIGGERS AMONG INDIVIDUALS WITH ASTHMA WHO ATTENDED CHEST CLINIC UNDER SPHMMC IN ADDIS ABABA, ETHIOPIA 2023(N = 281).	21
TABLE 5 BIVARIATE AND MULTIVARIABLE LOGISTIC REGRESSION ANALYSIS OF FACTORS ASSOCIATED WITH POOR ASTHMA CONTROL AMONG INDIVIDUALS WITH ASTHMA WHO ATTENDED CHEST CLINIC UNDER SPHMMC IN ADDIS ABABA, ETHIOPIA 2023(N = 281).	28

List of figures

FIGURE 1: THIS CONCEPTUAL FRAME WORK WAS CONSTRUCTED FROM PREVIOUS LITERATURE (11, 12, 14, 15, 34, 42) SPHMMC ADDIS ABABA, ETHIOPIA 2023	10
FIGURE 2 MOST COMMON ASTHMA SYMPTOM PATIENT EXPERIENCED AMONG INDIVIDUALS WITH ASTHMA WHO ATTENDED CHEST CLINIC UNDER SPHMMC IN ADDIS ABABA, ETHIOPIA 2023(N = 281)	23
FIGURE 3 CURRENT ASTHMA MEDICATION USED BY INDIVIDUALS WITH ASTHMA WHO ATTENDED CHEST CLINIC UNDER SPHMMC IN ADDIS ABABA, ETHIOPIA 2023(N = 281)	23
FIGURE 4: LEVEL OF ASTHMA CONTROL AMONG INDIVIDUALS WITH ASTHMA WHO ATTENDED CHEST CLINIC UNDER SPHMMC IN ADDIS ABABA, ETHIOPIA 2023(N = 281)	25
FIGURE 5.MDI INHALATION TECHNIQUE STATUS AMONG INDIVIDUALS WITH ASTHMA WHO ATTENDED CHEST CLINIC UNDER SPHMMC IN ADDIS ABABA, ETHIOPIA 2023(N = 2 81	26
FIGURE 6.MDI INHALATION TECHNIQUE STATUSAMONG INDIVIDUALS WITH ASTHMA WHO ATTENDED CHEST CLINIC UNDER SPHMMC IN ADDIS ABABA, ETHIOPIA 2023(N = 281).	27

Abbreviations and acronyms

ACT	Asthma Control Test
AHR	Airway Hyper-Responsiveness
AIRE	Asthma Insights and Reality in Europe
AOR	Adjusted Odds Ratio
BMI	Body Mass Index
COPD	Chronic Obstructive Pulmonary Disease
DALYs	Disability Adjusted Life Years
ED	Emergency Department
FEV	Forced Expiratory Volume
FVC	Forced Volume Capacity
FeNo	Fractional exhaled Nitric Oxide
GERD	Gastroesophageal Reflex Disease
GINA	Global Initiative for Asthma
GAN	Global Asthma Network
ICS	Inhaled Corticosteroid
IDAT	Inhalational Device Assessment Tool
LABA	Long Acting Beta Agonist
MDI	Metered Dose Inhalation
MOH	Ministry of Health
NHWS	National Health and Wellness of Survey
NIHIS	National health interview survey
PEF	Peak expiratory flow
SPHMMC	Saint Paul's hospital millennium medical college
SABA	Short Acting Beta Agonist
WHO	World Health Organization

1. Introduction

1.1. Back ground

One of the main causes of mortality and morbidity worldwide is chronic respiratory disease. The most prevalent chronic respiratory condition is asthma. According to disability-adjusted life years (DALYs), this disease was rated 23rd among the main causes of disease burden in 2015. It is one of the top 20 conditions in the world that lead to impairment(1)

Asthma is a chronic condition primarily distinguished by sporadic wheezing, coughing, and shortness of breath brought on by airway inflammation and hyper responsiveness. It is one of the most prevalent chronic lung diseases in the United State(US), affecting over 8% of adults, or roughly 20 million people(2).

AS estimated by the World Health Organization (WHO) in 2018 it reached around 339 million people were living with asthma worldwide. From these case, 417,918 were died within the same year, and most of the deaths were in low and middle-income countries(3).

The Asthma Insights and Reality in Europe (AIRE) survey was a significant, multinational study of adults with active asthma in seven European nations. It was carried out in 1999. It evaluated asthma control from the standpoint of the patient and discovered that both adults and children's asthma control levels were below the benchmark GINA had established(4).

Numerous issues related to asthma can have a severe impact on sufferers, those who care for them, and the nation at large. It could lead to loss of employment and educational opportunities, a poor quality of life, frequent ER visits, hospital stays, and even mortality (5,6). Additionally stab-like is the effect asthma has on the economy. Globally, asthma caused 24.8 million disability-adjusted life-years (DALYs) in 2016 alone(1). Recent statistics revealed that asthma-related medical costs were much greater. Particularly, people with uncontrolled asthma had up to a 4.6-fold higher frequency of hospitalizations, a 1.8-fold higher number of emergency department visits, and decreased productivity due to a higher likelihood of being unemployed, a larger number of days off from work, and a higher number of activity constraints(7–9).

A research conducted in Italy on level of asthma control suggested that from 396 assessed asthma patients 51.3% had poorly controlled asthma(10) and also another study done in Europe on predictors of asthma control indicated that among the 2050 adult Asthma patient surveyed only 35% had good asthma control and 65% had poorly controlled asthma(4). This data also in line with research conducted in Saudi on factor associated for poorly controlled asthma also showed that 39.8 % was uncontrolled asthma.

Asthma control remained the main clinical problem despite the achievements made in the creation of new diagnostic tests like the fractional exhaled nitric oxide (FeNO), new medicines like monoclonal antibodies, and the general availability of management recommendations(11). The burden of uncontrolled asthma could further cause Ethiopia's already failing healthcare system when combined with the country's higher prevalence of adult asthma in Debrebrehan(26.9%)(12) and all over Ethiopia (8.7%)(3).

The level of asthma control is influenced by a number of variables, including age, gender, smoking, comorbidities, seasonal deterioration, exposure to allergens/irritants/triggers, Inappropriate device use and treatment-related characteristics like disease perception, medication adherence, and drug belief(13,14)

There are currently small or insufficient data available to estimate the prevalence of uncontrolled asthma and associated risk factors. Therefore, the goal of this study was to generate evidence of uncontrolled asthma prevalence for study setting and its predictors in chest clinics. Asthma treatment quality is ultimately impacted by poor asthma control, thus the findings of this study was a significant tool for clinicians and policy makers as they develop strategies to address these issues.

1.2. Statement of the problem

Asthma is one of the most common chronic respiratory disease in the world; the global burden of disease study showed that more than 345,000 mortality around worldwide due to asthma in 2010. Around 30 million people are affected by asthma in Europe and approximately €18 billion is lost for asthma care and decrease productivity(15) and is related with a significant socioeconomic load and daily lost from work place and absenteeism from school have been announced as the fundamental burden of asthma and also disability due to asthma worldwide has been estimated to be about 15 million per year, nearly to that of other chronic diseases, like as diabetes, cirrhosis of the liver or schizophrenia(16).

Asthma is remains poorly controlled in a large proportion of asthma patients under specialist care in Africa including Ethiopia(17–24). Based on the asthma control test (ACT), analysis revealed that an average Ethiopia 78.0%(58%_97%) had a higher percentage of uncontrolled asthma(3).

Uncontrolled asthma is negatively impacts patients, families, and the community(20), Patients who did not have well-controlled asthma had greater utilization rates of asthma medications and healthcare services and are more likely to report missing multiple days of work/school compared to patients whose asthma was well-controlled(25).

The most frequent predictors of uncontrolled asthma are incorrect inhalation techniques, frequent SABA use, history of exacerbations, presence of comorbidities, use of oral corticosteroids, and irregular follow-up(3). The level of asthma control was found to be inadequate in few studies conducted in Ethiopia on patients at chest clinics.(26–28). Also insufficient study was done on level of asthma control in study area.

Therefore, studying and understanding of these levels of asthma control and factors associated with asthma control in these hospitals may help hospitals, pulmonologists, treating physicians and Respiratory therapists to full fill this gap by developing a hospital approach to early identify and control these factors which affect asthma control and potentially lessen the financial burden and morbidity of the disease and suggest that emphasis on improving asthma control may dramatic effects on patient well- being and utilization of healthcare resources and also do further research.

1.3. Significance of the study

Despite the fact that different studies have been conducted on the level of asthma control in the world and developing country including Ethiopia, there is no sufficient data to determine national burden of uncontrolled asthma and associated factors among asthma patient in Ethiopia. The aim of the study was synthesize an evidence for the study area prevalence of uncontrolled asthma and its associated factors in these hospitals.

Asthma is being common from year to year; however, it is not having the level of attention it deserves for its proper management. Although its risk factors could be avoided to prevent the occurrence or even the exacerbation in Ethiopia, many health professionals and even the health sectors have done an inefficient effort. The level of awareness of the community toward the prevention of the disorder is suggested to be inadequate. Therefore, this study will contributed base line to full filling information gaps on the existing of poor asthma control and associated risk factors.

The finding of this study will a valuable contribution for pulmonologists, treating physicians and Respiratory therapists' and policy makers to design appropriate strategy to tackle the problems associated with uncontrolled asthma which is ultimately affects the quality of asthma care. The result of the study was indicated that high prevalence of uncontrolled asthma level which was alerts the hospital to devise strategy to improve this outcome.

2. Literature review

2.1. General concepts of asthma

Asthma is a heterogeneous disease, usually characterized by chronic airway inflammation that causes the following symptoms such as wheeze, shortness of breath, chest tightness, and/or cough and by variable expiratory airflow limitation(27). It is characterized by the presence of bronchial obstruction that can cause bronchial muscle contraction, inflammation of the bronchial wall, or hypersecretion of mucus and it is a multifactorial disease resulting from a combination of genetic pre- disposition and environmental risk factors (allergens, tobacco, pollution, etc.(29). The incidence and prevalence of asthma have increased during the past 20 years, affecting 5-10% of the global population(30).

According to the Global Asthma Network (GAN) research, in 2014 it was predicted that 334 million individuals globally had asthma, up from 300 million asthmatic patients in 2006.(28).Asthma prevalence is currently higher in industrialized countries; however it is still rising in less developed countries (31)

Previous study done in five European countries from data of 2006 National Health and Wellness Survey (NHWS) by using asthma control test (ACT) indicated that from 3619 respondents age ≥ 18 years ,the prevalence of self-reported physician diagnosis of asthma was 6.1%(15 million people); 56.6% of treated asthmatics patients was not well controlled(32)

2.2. Asthma control among asthmatic patient

Well-asthma control means the extent to which the effects of asthma have been reduced or resolved by treatment(22). Asthma control has 2 components: symptom control and risk factors for future poor outcomes, particularly flare-ups (exacerbations). It is important to assess the patient's future risk for exacerbations, even when symptom control is good. Risk factors for exacerbations that are independent of symptom control include a history of ≥ 1 exacerbation in the previous year, socioeconomic disadvantages, poor treatment adherence, incorrect inhaler technique, low lung function, smoking, and blood eosinophilia(8).

In 2010, study done in Europe showed that the proportion of treated asthma patients assessed as having not well-controlled asthma was 53.5% and significant impact on health resources and

patients health status (33). Asthma is under control in 45% of 8000 asthmatic patients in a similar research conducted in Europe (27).

In the United States, 51.6% of asthma patients had uncontrolled asthma, according to a study by Schatz et al. Similarly another study conducted in Riyadh revealed that 39.8% of asthma patients had uncontrolled asthma. Factors contributing to this uncontrolled asthma include patients' lack of asthma knowledge, active and passive smoking, the duration of their asthma, outdoor and indoor triggers, and the use of bronchodilators alone (14).

According to a study on asthma control done in Nigeria, 82.9% of patients had poor control on average. Only 20% of patients received maintenance therapy with inhaled corticosteroids; more than half only utilized short-acting Beta agonists. In the previous 12 months, 38 individuals visited the emergency room without an appointment, and 68.8% of them had trouble using their inhaler devices. Visits to the emergency department and improper inhaler technique were independent predictors of poor asthma control (18).

As systematic review done in Ethiopia on asthma control showed that the rate of poor asthma control is 78% and frequent predictors of uncontrolled asthma are frequent short acting beta agonist (SABA) use, moderate/severe persistent asthma, history of exacerbations, presence of comorbidities like obesity, rhinitis, GERD, use of oral corticosteroid, and irregular follow-up (3).

The main factor contributing to the burden of disease associated with asthma is poor adherence to treatment by patients (34). A different additional factor about asthma and its treatment as well as poor patient clinician communication (35). The difference assumption concerning asthma control (36), or may tolerate symptoms indicative of poor control based on the belief that the symptoms are part of living with asthma (37). All of this condition contribute to poor asthma control.

For this reason the main goals of asthma management are to control symptoms, prevent exacerbations, improve and maintain lung function while minimizing side-effects of asthma medications. (use for significance) improvements in asthma control do not only impact the patients' daily life but are also associated with a reduced risk of exacerbations and lung function impairment and expected to be cost-effective by reducing the overall cost of asthma care and

indirect costs related to decreased productivity(13).Asthma exacerbation in previous 12 months was increased risk for future exacerbation in uncontrolled asthma(38).

We can achieve Well- asthma control in different way like minimize in exposure to environment risk factors, assessment of asthma severity, appropriate treatment based on level of severity, regular monitoring of symptom, and lung function ,with adjustment of treatment if necessary and lastly patient education and information(21). Additionally asthma is variable disease (i.e. it can change over time) indicating that even asthma is adequately controlled or well-controlled, an asthma exacerbation may still occur. Therefore patients need to know how to control their asthma exacerbation and how to get help from health care provider when they face this condition(16)

Newly revised GINA recommends that every adult and adolescent with asthma should receive ICS-containing controller medication to reduce their risk of serious exacerbations, even patients with infrequent symptoms. Every patient with asthma should have a reliever inhaler for as-needed use, either low dose ICS-formoterol or SABA. ICS-formoterol is the preferred reliever because it reduces the risk of severe exacerbations compared with treatment options in which the reliever is SABA. However, ICS-formoterol should not be used as the reliever by patients who are taking a different maintenance combined ICS/LABA; for these patients, the appropriate reliever is SABA(8).

Despite the almost annual publication of GINA Guide lines, the health initiatives undertaken and the asthma control campaigns, the control of asthma remains a crucial problem. Several clinical studies suggest that the asthma of many subjects is still uncontrolled and that asthma morbidity remains high while the disease seems to be far from an optimal control, although effective and safe treatments, such as inhaled corticosteroids (ICS) and long-acting beta-adrenergic agonists (LABA) are widely available(10).

Disease severity is not a constant feature of an individual patient's asthma but varies over time. Therefore, periodic assessment of asthma control is more relevant to asthma management. In the 2008 GINA guidelines asthma classification was revised from the previous system, which utilized disease severity to the use of control of asthma. Asthma control may be defined in several ways: Generally, diseases control may indicate disease prevention, or even cure.

However, in asthma, where neither of these is currently possible, it refers to control of the clinical manifestations of disease(18).

As study conducted in Brazil on asthma control indicated that, availability of asthma medication was associated with asthma control. In this case patient who could purchase medication manifest adequate asthma control, while patient who depend on public health care system indicated poor asthma control(33).

According to guide line assessment of asthma severity is necessary for appropriate and adequate treatment or asthma control, especially the selection and dosing of medication(41). Based on symptom and sign of severity asthma is classified in to four clinical stages; Intermittent, mild persistent, moderate persistent, and sever persistent. Certain medications are indicated for each clinical stage. of these anti-inflammatory drugs inhaled glucocorticoid steroids(ICS) is used alone or combined with long acting beta agonist (LABA) are known to be most effective and advised as first line treatment for persistent asthma(22).

Fortunately, asthma can be effectively treated, and most patients can achieve good control of their asthma. Adequate asthma control means that patients can: Avoid troublesome symptoms during day and night, Need little or no reliever medication , Have productive, physically active lives, Have normal or near normal lung function, and avoid serious asthma flare-ups (exacerbations, or attacks)(8).

A lot of tools are available to assess level of asthma control(8,42–44) from those tools Asthma control test (ACT)(45)is validated for patients age ≥ 12 years and have numerically scored questions providing total score and cut points for varying level of asthma control (44).

Only 28.9 percent of respondents of the 409 participants in a multi- centers institution-based cross-section study in North West Ethiopia had asthma under control. The reason the asthma wasn't controlled in this setting was due to poor medication adherence and a strained relationship with the healthcare provider(24).

2.3. Associated factors of uncontrolled asthma

According to various studies, the following factors were associated with uncontrolled asthma: incorrect inhalation techniques(19,20,30,40,46,47) frequent SABA use (19),(14),(33),(39) , moderate-to-severe persistent asthma(39), history of exacerbations (8),comorbidities (3), use of oral corticosteroids (OCS) (19,39), lack of regular follow-up (39,46), use of bio fuel for cooking and longer duration of asthma(20),perceived control of asthma (19), lack of awareness and a negative attitude towards asthma, non-adherence to inhaled corticosteroids (ICS)(48),low monthly income(49), being in the 35–64 age range (27), and cold weather (39),are some of the factors that contribute to asthma.

In general asthma is often under controlled or uncontrolled in patient of all age over the world including our county Ethiopia (3,16,31,34), and is frequently unrecognized(50).Resulting a significant burden of disease(34),. Consequently assessing the level of asthma control at every opportunity is critical.

Therefore the aim of this study is to assess the level of asthma control and factor associated with poor asthma control in asthma patient who attendedSPHMMC chest clinic in Addis Ababa, Ethiopia.

2.4. Conceptual framework

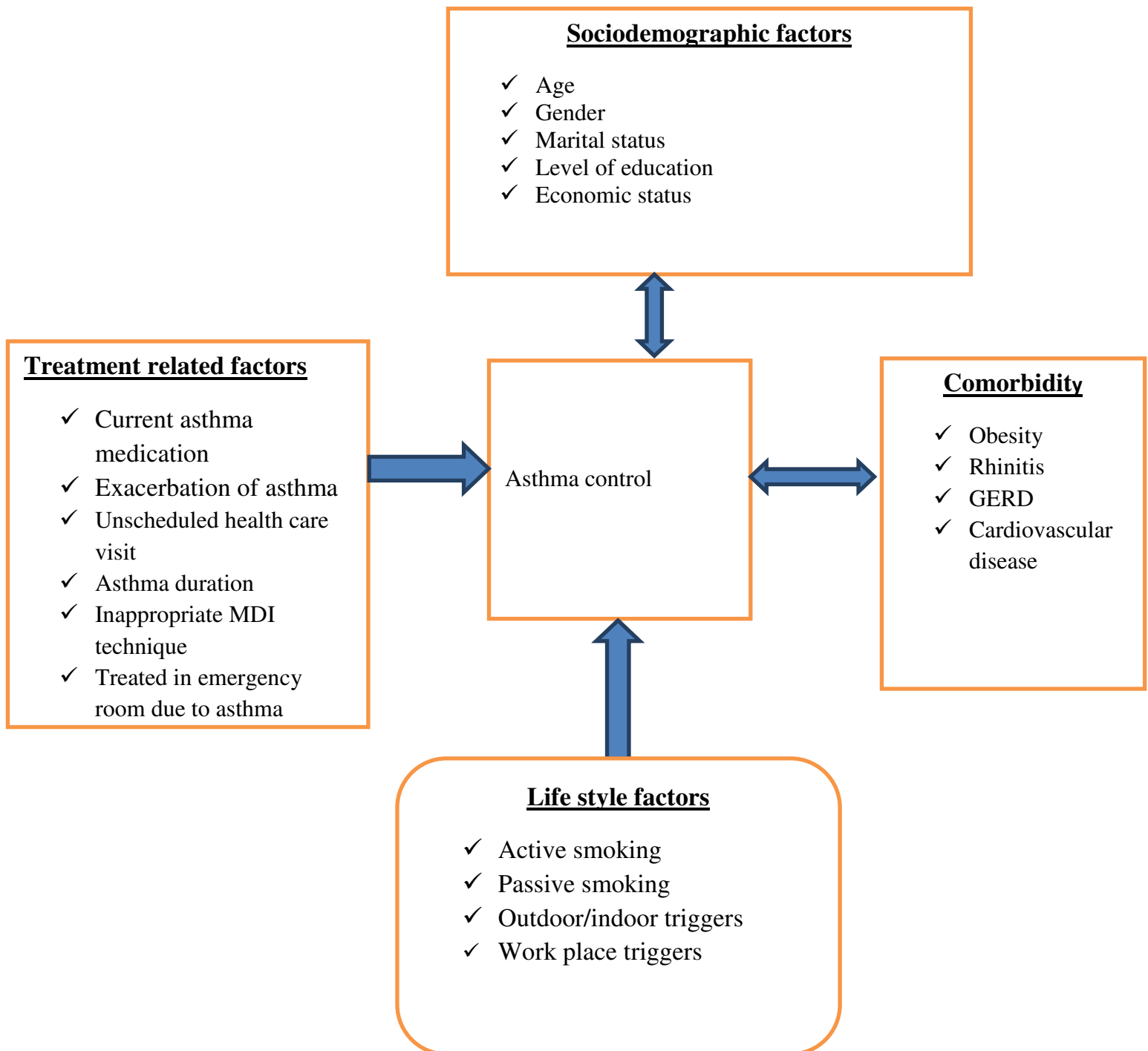


Figure 1: This conceptual frame work was constructed from previous literature (11, 12, 14, 15, 34, 42) SPHMMC Addis Ababa, Ethiopia 2023

3. Objectives

3.1. General objective

To assess the level of asthma control and associated factors among asthmatic adult Patients who attended Saint Paul's hospital millennium medical college (SPHMMC) Chest Clinic of Addis Ababa, Ethiopia, 2023.

3.2. Specific objective

1. To determine the level of asthma control among asthmatic adult patients who attended Saint Paul's hospital millennium medical college (SPHMMC) chest clinic of Addis Ababa, Ethiopia, 2023.
2. To identify factors associated with asthma control among asthmatic adult patients who attended Saint Paul's hospital millennium medical college (SPHMMC) chest clinic of Addis Ababa, Ethiopia, 2023.

4. Methodology

4.1. Study setting

Addis Ababa is the largest and capital city of Ethiopia. According to the 2012 Health and Health related indicators published by Ministry of health (MOH) Addis Ababa has 13 public Hospitals and 98 Health Centers(39). Among these, 13 public hospitals, SPHMMC is purposely selected for this institution based quantitative cross-sectional study which was conducted from March 2023 to January 2023.

This hospital is selected purposely due to the high patient attended at chest clinic and has spirometer which is used to confirm diagnosis of asthma and Pulmonologist physician were found.

The SPHMMC is the second largest hospital in the country and established in 1968 by the late Emperor Haile Selassie, with catchment population of more than 5 million. Currently it has more than 700 in-patient beds and sees an average of 1200 emergency and outpatient clients daily.

The annual patient load of the hospital is more than 300,000 and mostly serves underprivileged patients with poor socioeconomic status and more than 80% of the clients don't afford to pay for their health care and are served free of charge. Also it serves as teaching hospital for medical students, nurses, and residents of different specialties(51).

4.2. Study design

Institutional based cross-sectional study design was applied.

4.3. Study period

From March 2023 to May 2023

4.4. Source population

All patients who attended SPHMMC chest clinic were the source population.

4.5. Study population

Selected asthma patients who attended SPHMMC chest clinic during study time was the study population.

4.6. Inclusion criteria

- ✓ All confirmed diagnosed of asthma with follow-up at the chest clinic for their asthma and ages of participant ≥ 18 years were included in the study.
- ✓ Patient who were on asthma treatment for at least the last three months

4.7. Exclusion criteria

- ✓ critically ill patient
- ✓ who refused to participated in the study

4.8. Sample size determination

The sample size is determined by using single population proportion with confidence 95% and degree of precision 5%. It is calculated based on the single population proportion formula by considering the following assumptions;

n = sample size, α = the level of significance ($Z = 1.96$ for 95% CI), p = expected true proportion of uncontrolled asthma in study area was 77.4%(39). d = desired precision = 0.05

$$n = \frac{(Z_{\alpha/2})^2 P(1-P)}{d^2} \quad n = \frac{(1.96)^2 * 0.774(1-0.774)}{0.05^2} \approx 269/0.95 \approx 284$$

Using non response rate of 5% = $n/1 - \text{non-response rate } \% \approx 284$. When n = sample size and non-response rate $\% = 1 - 0.05 = 0.95$. Total sample size is 284.

4.9. Sampling technique

The SPHMMC was chosen as study setting purposively selected because it was one of the areas where chest clinic were found. Systematic random sampling technique was used to take a total of 284 asthma patients.

Based on preliminary study the amount of total visited for asthma at SPHMMC during study period was expected 812 patients during the three month periods. Since the study population was around 812 and the calculated final proportional sample size for SHMMC was 284, k was then calculated as $812/284 \approx 2$. Therefore I was selected one patient randomly by lottery method from the first two patients and then enrolled every other patients who visited the chest clinic were participants of this study.

4.9.1. Study variables

Dependent variables

- Level of asthma control

Independent variables

- Biographic data (age, gender, marital status, level of education,
- use of short acting beta agonist only(SABA)
- History of exacerbation in past 12 months
- Presence of comorbidities like obesity, rhinitis, GERD, use of oral corticosteroid, irregular follow up
- Smoking condition
- Outdoor/indoor triggers
- Work place trigger
- Asthma duration
- Poor inhale technique

4.9.2. Instruments

After Literature reviewed(17,39,50) data collector administered structured questionnaire and validated and reliable metric for patients' aged ≥ 12 years old asthma control test (ACT)tools was adopted. The reliability of this ACT was Cronbach alpha of 0.79 indicated good internal consistency(52). Asthma control during the past 4 weeks wasassessed using the ACT by addressing five questions assessing the frequency of shortness of breath, frequency of asthma night time symptoms, degree of functional limitation, frequency of using rescuer inhalers, and patient's self-assessment of their level of asthma control. Each item has five response choices (each with a score ranging from 1 to 5)(16),(52).

Respondents were provided information about their demographic background like general health characteristics and asthma specific disease characteristics. Demographics characteristics included sex, age, marital status, education and current of residence.Body mass index (BMI), smoking status. Asthma specific disease characteristics/ medical history of asthma/ included the number of years since diagnosis of asthma by a physician, self-rated asthma severity and number of times they visit emergency room for their asthma attacks, presence or absence of triggers, number of

hospital admission due to their asthma, presence or absence of outdoor/indoor triggers/use of biomass fuel for cooking , presence or absence of comorbidities (allergic rhinitis, gastro-esophageal reflux disease and obesity), use of controller medication, chest specialist visits in the year.

Appropriateness of metered dose inhalation (MDI) technique was assessed by **Inhalational Device Assessment Tool (IDAT)** this tool has the reliability indices range from kappa statistic .55 to .94, with the mean as .82 for all five devices. This tool also has five steps and each of the five steps for all forms of the IDAT is scored as 1 or 0. A step is scored as '1' if no errors are made for that step. A step is scored as '0' if there is at least one error in performing that step. The scores for the five steps are then added, for a total possible maximum score of 5, and a minimum score of 0. Target proper techniques for IDAT- a score of 95% to 100% should be obtained (30,53).

Inhalational Device Assessment Tool (IDAT) steps.

1. Remove mouthpiece cap
2. Shake inhaler (suspensions only)
3. Breathe out before firing
4. Inhales appropriately -release 1 puff and Continues breathing in slowly for about 5 second
5. Hold breath for 10 s

4.10. Data collection and procedure

The data was collected from patient by data collector administer questionnaire at SPHMMC chest clinic by trained data collector. This structured questionnaire was extracted from previous literature and pre-tested on 5% of calculated sample size at TikurAnbessa Specialized Hospital (TASH) chest clinic. The current asthma medication and recent exacerbation history was taken from patient data.

Data was collected by 02 BSc nurse after they took 01 day training and orientation on data collection. The questionnaire was initially prepared in the English version and translated to Amharic language by principal investigator and check daily consistency of data completeness. The level of asthma control was assessed by comprises five questions assessing the frequency of

shortness of breath, frequency of asthma nighttime symptoms, degree of functional limitation, frequency of using rescuers, and patient's self-assessment of their level of asthma control. Each item has five response choices (each with a score ranging from 1 to 5

4.11. Operational definition

Level of asthma control: implies the extent to which manifestations of asthma are reduced or removed by treatment.(8)

Well-controlled: It represents asthma control in which a respondent's ACT score ranges from ≥ 20 out of 25 on the ACT section (16,17,45,52)

Uncontrolled/poor asthma control: This stands for the respondent's score being less than 20 of 25 ACT scores (16,17,45,52).

Appropriate MDI technique: if no errors are made for that step on Inhalational Device Assessment **Tool** (IDAT) (30,53).

Inappropriate MDI technique:(30,53) if there is at least one error in performing for that step on Inhalational Device Assessment **Tool** (IDAT) (30,53).

4.12. Data quality control and management

Before the actual data collection, a pre-test was done on 5% of the sample size by the principal investigator and some modification was done like redundant questions were emerged accordingly.

The data collectors weretaken a one-day training/orientation session for the importance of the study and how to ensure confidentiality of the study participants. The collected data was reviewed daily for its completeness, accuracy, clarity, and consistency by the principal investigator.

4.13. Data analysis plan and procedure

After the data wascollected, it was coded, edited, cleaned, and entered into excel and then export into SPSS statistical software version 25 for analysis. Descriptive statistical analysis such as simple frequencies, measures of central tendency, and variability measures was used to describe the characteristics of participants. Then the information was presented using frequencies,

summary measures, tables and figures. Bi-variable and multivariable analysis was used to saw the association between each independent variable and the outcome variable, using binary logistic regression analysis. Categorical variables were summarized as frequencies and percentages while continuous data was described using mean, median, standard deviation. While studied the factors associated with asthma control, the association between potential factors and uncontrolled asthma was explored using bivariate logistic regression.

Variables significant at $p\text{-value} \leq 0.25$ in the univariate model were moved to multivariable logistic regression analysis model to identify independent factors. In the final model $p\text{-value} < 0.05$ was considered as statistically significant. Multicollinearity, among independent variables, and Hosmer-Lemeshow model goodness of fit test at $p\text{-values} > 0.05$ was performed.

4.14. Ethical consideration

After institutional review board (IRB) was approve the study protocol, ethical clearance was obtained from SPHMMC institutional review board (IRB) prior to data collection. After approval a formal letter was obtained and I gave it to SPHMMC chest clinic unithead. The goal of the study was explained to the study subjects. At the time of data collection, written consent was taken to confirm whether they were willing to participate. Those not willing to participate were given the right to do so. Confidentiality of responses was also ensured throughout the research process.

4.15. Dissemination of results

This study's findings will be presented to SPHMMC and the hard copy will be available at the SPHMMC library. It will also disseminate to FMOH, studied hospitals and finally, it will be published in peer-review journals.

5. Result

5.1. Sociodemographic characteristics

The study had 281 respondents as a whole, with a response rate of 98.94%. The ages of the participants ranged from 18 to 88, with a mean $\pm$ (SD) age of 48 ± 18 years. The majority of respondents 162 (57.7%) were women. Among the study participants 175 (62.3%) were married and 89 (31.7%) had college/university degree. The majority of patients 222 (79%) resided in urban area. In terms of occupation, 78 (27.8%) were house wife, while 42 (14.9%) worked in private organization. The average monthly family income was ETB 4741.99 ± 2045.94 (SD) and more than half of participants 178 (63.3%) BMI ranged between 18.5 to 25 kg/m^2 .

Table 2: Socio-Demographic and Clinical Information of Asthma Patients who attended Chest Clinic under SPHMMC in Addis Ababa, Ethiopia 2023 (n = 281)

Variables	Category	Frequency	Percent
Age (year): mean $\pm$ SD		48 ± 18	
Age	18 - 29 years	57	20.3
	30 - 44 years	66	23.5
	45 - 59 years	76	27.0
	≥ 60 years	82	29.2
Gender	Male	119	42.3
	Female	162	57.7
Marital status	Single	49	17.4
	Married	175	62.3
	Divorced/Separated	19	6.8
	Widowed	38	13.5
Educational status	No formal education	60	21.4
	Primary School	56	19.9
	Secondary School	73	26.0
	College/University	89	31.7

	Other	3	1.1
Residence	Urban	222	79.0
	Rural	59	21.0
Occupation	Government employee	32	11.4
	Private organization employee	42	14.9
	Housewife	78	27.8
	Merchant	29	10.3
	Student	15	5.3
	Unemployed	43	15.3
	Other	42	14.9

Other: Cleaner, Driver, Construction worker and Farmer

5.2. Asthma related and other clinical characteristics of participants

Among 281 asthma patient assessed, more than half 155(55.2%) of respondents had comorbidity. Hypertension (43.4%), GERD (42%) and Diabetes (24.2%) were the most common comorbidities recorded.

The majority of respondents 203(72.2%) were non-smoker and only 46(16.4%) were past smoker. One hundred twelve (39.9%) of participants had working area asthma triggers. Among working area asthma triggers dust 95(33.8%) and bad/strong smell (90(32%)) respectively were the most frequent triggers reported.

Table 3: Comorbidity related factors among asthma patients who attended Chest Clinic under SPHMMC in Addis Ababa, Ethiopia 2023(n = 281).

Variables	Characteristics	Frequency	Percent
Comorbidity	No	126	44.8
	Yes	155	55.2
GERD	No	163	58.0
	Yes	118	42.0

Recurrent episodes of runny nose or sneezing	No	181	64.4
	Yes	100	35.6
Diabetes	No	213	75.8
	Yes	68	24.2
Hypertension	No	159	56.6
	Yes	122	43.4
Coronary Heart Disease ¹	No	259	92.2
	Yes	22	7.8
Cerebrovascular disease	No	269	95.7
	Yes	12	4.3
Chronic Kidney disease	No	269	95.7
	Yes	12	4.3
Chronic liver disease	No	277	98.6
	Yes	4	1.4
HIV/AIDS	No	277	98.6
	Yes	4	1.4
Peripheral arterial disease	No	280	99.6
	Yes	1	0.4
PUD	No	232	82.6
	Yes	49	17.4
Other ²	Yes	2	0.7

¹CHD: Angina, STEMI, Non-STEMI

²Other: Epilepsy & Migraine headache

5.3. Treatment related factors and Current Medications Taken by Asthma Patients

The mean length of sickness following an asthma diagnosis was 22 ± 14.8 years and cough 186(66.2%) was the most prevalent symptom which the patient experienced and Over half 208(74%) of those participating in the study stated that they had experienced at least one asthma episode in the previous 12 months. Among respondents 153(54.4%) asthma patients had regular chest clinic follow-up and 147(52.3%), 28(10%) of patient were admitted emergency and ICU respectively. Majority of respondents 160(56.9%) current asthma medication was SABA + ICS and 71 respondents (25.3%) used SABA only; 38 patients (17.1) utilized (ICS) + LABA, (Table 4).

Table 4: Treatment related factors and asthma triggers among individuals with asthma who attended Chest Clinic under SPHMMC in Addis Ababa, Ethiopia 2023(n = 281).

Variable	Characteristics	Frequency	Percent%
Duration of Asthma	0-10yrs	72	25.6
	11-20yrs	92	32.7
	21-30yrs	46	16.4
	>30 yrs	71	25.3
Most common symptom	Wheezing	56	19.9
	Cough	186	66.2
	Chest tightness/pain	38	13.5
	Shortness of breath	1	0.4
Current asthma medication	SABA only	71	25.3
	Oral corticosteroid only	1	0.4
	ICS + LABA	48	17.1
	SABA + ICS	160	56.9
	Other	1	0.4
	Total	281	100.0
Regular follow up	Yes	153	54.4
	No	128	45.6

Exacerbation in the last 1 year	Yes	208	74.0
	No	73	26.0
ER admission	Yes	147	52.3
	No	134	47.7
ICU admission	Yes	28	10.0
	No	253	90.0
Smoking status	Non-smoker (never smoked)	203	72.2
	Active smoker	19	6.8
	Passive smoker	13	4.6
	Past smoker	46	16.4
Asthma trigger	No	169	60.1
	Yes	112	39.9
Dust	No	186	66.2
	Yes	95	33.8
Cold weather	No	212	75.4
	Yes	69	24.6
Bad/strong smell	No	191	68.0
	Yes	90	32.0
Smoke	No	262	93.2
	Yes	19	6.8
	Total	281	100.0
Other triggers	No	260	92.5
	Yes	21	7.5
	Total	281	100.0
Indoor/outdoor exposure	No	156	55.5
	Yes	125	44.5

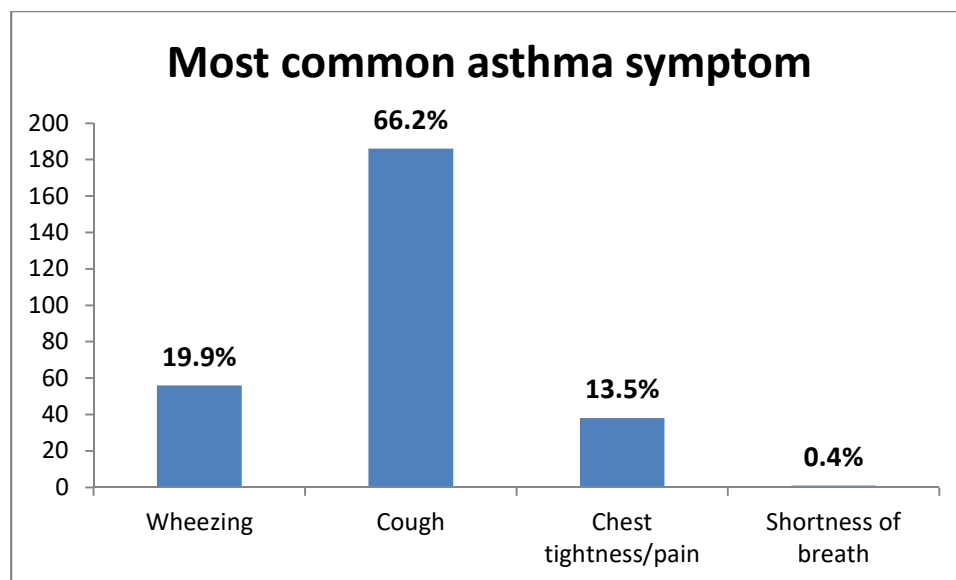


Figure 2 most common asthma symptom patient experienced among individuals with asthma who attended Chest Clinic under SPHMMC in Addis Ababa, Ethiopia 2023(n = 281)

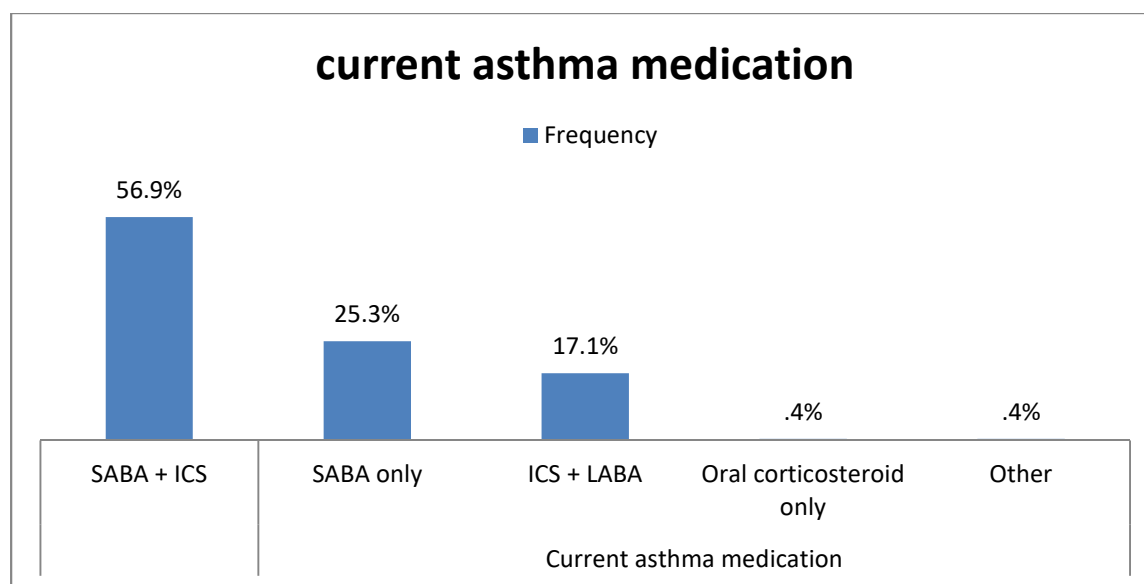


Figure 3 current asthma medication used by individuals with asthma who attended Chest Clinic under SPHMMC in Addis Ababa, Ethiopia 2023(n = 281)

5.4. Level of asthma control based on the Asthma Control Test (ACT)

In order to evaluate asthma control, the ACT instrument was employed in this study. The cut-point for well-controlled asthma was an ACT score of greater than or equal to 20 out of a possible 25. The mean score on asthma control test (ACT) was 16.81 ± 3.43 . Only 80 (28.5%) subjects had well-controlled asthma and uncontrolled asthma was 201 (71.5%). (Figure 4).

Table 5asthma control assessment among individuals with asthma who attended Chest Clinic under SPHMMC in Addis Ababa, Ethiopia 2023(n = 281).

variables	characteristics	Frequency	Percent
In the past 4 weeks, how much of the time did your asthma keep you from work or school	All of the time [1]	1	0.4
	Most of the time [2]	34	12
	Some of the time [3]	85	30
	A little of the time [4]	121	43
	None of the time [5]	40	14
During the past 4 weeks, how often have you had shortness of breath	Once a day [2]	35	12
	3 to 6 times a week [3]	112	40
	Once or twice a week [4]	100	36
	Not at all [5]	34	12
During the past 4 weeks, how often did your asthma symptom wake you up at night	4 or more nights a week [1]	2	0.7
	2 to 3 nights a week [2]	54	19
	Once a week [3]	107	38
	Once or twice[4]	74	26
	Not at all [5]	44	16
During the past 4 weeks how often have you used your rescue medication	3 or more time per day[1]	2	0.7
	1 to 2 time per day [2]	30	11
	2 or 3 time per week [3]	141	50
	Once a week or less [4]	92	33
	Not at all	16	5.7
How would you rate your asthma control during the past 4 weeks	Poorly controlled [2]	62	22
	Somewhat controlled[3]	145	52
	Well- controlled [4]	68	24
	Completely controlled [5]	6	2.1

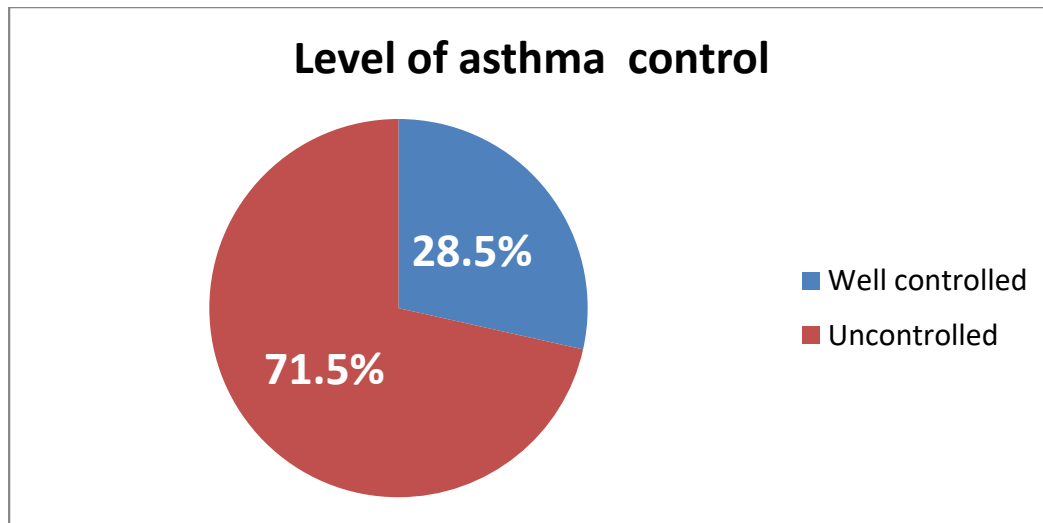


Figure 4: Level of asthma control among individuals with asthma who attended Chest Clinic under SPHMMC in Addis Ababa, Ethiopia 2023(n = 281)

5.5. MDI steps and technique among individuals with asthma

In this study two-third of respondents 229(78.9%) were practiced inappropriate MDI technique. Majority of participants 210(74.7%) were didn't performed breath holding for ten seconds

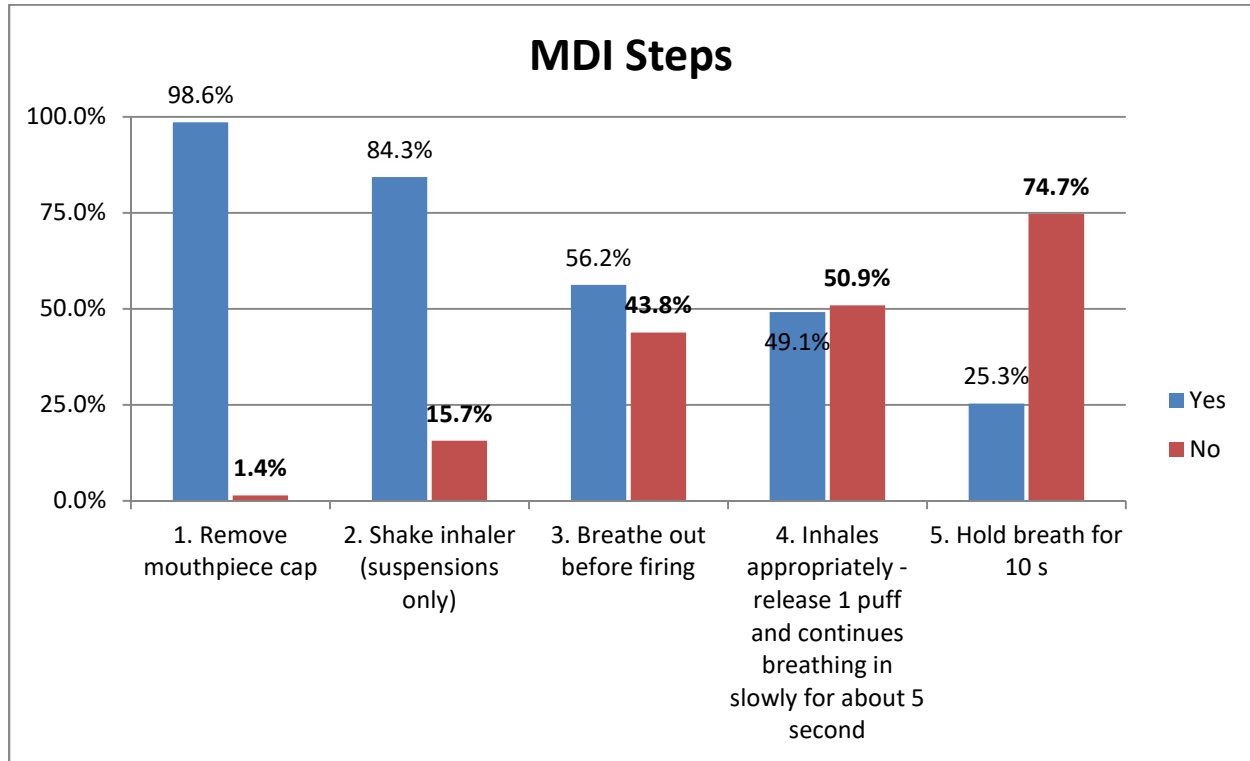


Figure 5.MDI inhalation technique status among individuals with asthma who attended Chest Clinic under SPHMMC in Addis Ababa, Ethiopia 2023(n = 2 81

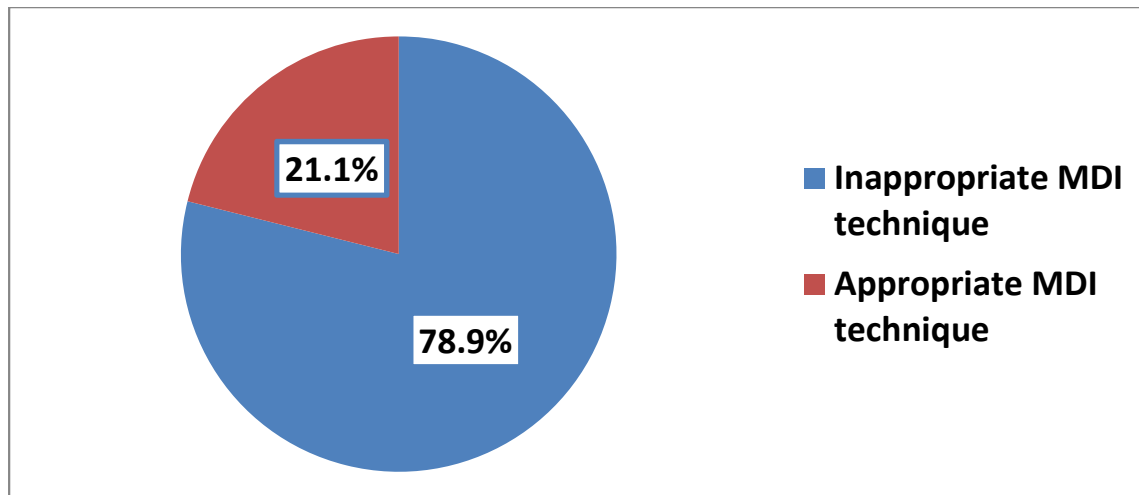


Figure 6:MDI inhalation technique statusamong individuals with asthma who attended Chest Clinic under SPHMMC in Addis Ababa, Ethiopia 2023(n = 281).

5.6. Association factors of uncontrolled asthma

In binary logistic regression age, marital status, educational status, residence, active smoking,comorbidity,having irregular follow up, inappropriate MDI technique, taking ICS + SABA ,and combined ICS/LABA were associated with uncontrolled asthma with 95% CI and p-value of <0.25.

According to a multivariable logistic regression analysis, there was no statistically significant association between the age class, educational status, residence/place of living/, and smoking status. However, there was a substantial association between comorbidity, irregular chest clinic follow-up, current asthma medication, inappropriate MDI technique, taking ICS + SABA ,and fixed combined ICS/LABA were significantly associated with uncontrolled asthma with 95% CI and $p < 0.05$ among those investigated.

Being Separated/divorced/widowed / (AOR 6.62695% CI.1.251 – 35.084, $p = 0.026$), was 6.62times more likely to develop uncontrolled asthma than other marital status. Having comorbidity (AOR 6.208, 95% CI 2.149-17.937, $p < .001$), irregular chest clinic follow up (AOR 9.918, 95% CI 3.575-27.512, $p < .001$), in appropriate MDI technique (AOR 3.546, 95% CI 1.393-9.028, $p < .001$), and taking short acting beta agonist(SABA) + inhaled corticosteroids (ICS) andcombined inhaled corticosteroids (ICS)/ long acting beta agonist (LABA) asthma

medication (AOR .017, 95%CI .003-.087, $p < .001$, AOR .047, 95%CI .011-.201, $p < .001$) was less likely to develop uncontrolled asthma respectively. (Table 5)

Table 6 Bivariate and Multivariable logistic regression analysis of factors associated with uncontrolled asthma among individuals with asthma who attended Chest Clinic under SPHMMC in Addis Ababa, Ethiopia 2023(n = 281).

Variables	Categories	Well-controlled	uncontrolled control	COR (95% CI)	P value	AOR (95% CI)	P value for AOR
Age	18 - 29 years	32(56.1%)	25(43.9%)	1	1	1	1
	30 - 44 years	22(33.3%)	44(66.7%)	0.084(0.34 - 0.207)	.012	1.432 (.481-4.262)	.519
	45 - 59 years	18(23.7%)	58(76.3%)	.216(.089-.527)	.000	.615 (.149 -2.527)	.500
	≥60 years	8(9.8%)	74(90.2%)	.348(.141-.858)	.000	1.109 (.173 - .110)	.913
Marital status	Single	28(57.1%)	21(42.9%)	1	1	1	1
	Married	47(26.9%)	128(73.1%)	0.072(0.025-0.212)	.000	2.515 (.872- 7.256)	.088
	Divorced/Separated/widowed/	5(23.7%)	52(76.3%)	0.262(0.099-0.695)	.007	6.626(1.251-35.084)	0.026
Educational Status	No formal education	4(6.7%)	56(93.3%)	1	1	1	1
	Primary School	10(17.9%)	46(82.1%)	.329(0.97-1.117)		.825(.164-4.138)	.815
	Secondary School	24(32.9%)	49(67.1%)	.146(.047-.450)	0.21	1.231(.216-7.023)	.815
	College/University	39(43.8%)	50(56.2%)	.092(.031-.274)	0.24	.616 (.102-3.729)	.503

	Other	3(100%)	0(0%)	.000(000)		.000	.999
Residence	Urban	73(32.9%)	149(67.1%)	.275(.119-.635)	.002	1.256(0.368-4.287)	.716
	Rural	7(11.9%)	52(88.1%)				
Smoking status	Non-smoker (never smoked)	65(32%)	138(68%)	1	1	1	1
	Active smoker	6(31.6%)	13(68.4%)	1.021(.371-2.806)	.002	.881 (.214-3.617)	.860
	Passive smoker	0(0%)	13(100%)	1	1	1	1
	Past smoker	9(19.6%)	37(80.4%)	.000		1.571(.513-4.807)	.429
Comorbidity	No	58(46%)	68(54%)	1	1	1	1
	Yes	22(14.2%)	133(85.8%)	5.156(2.913-9.128)	<0.001	6.208 (2.149-17.937)	<i>P</i> <.001
Regular chest clinic follow-up	No	9(7%)	119(93%)	11.449(5.417-24.197)	<0.001	9.918(3.575-27.512)	<i>P</i> <.001
	Yes	71(46.4%)	82(53.6%)	1	1	1	1
MDI inhalation technique status	Inappropriate MDI technique	45(20.5%)	175(79.5%)	5.671(3.069-10.481)	<0.001	3.546 (1.393-9.028)	.008*
	Appropriate MDI technique	35(59.3%)	24(40.7%)	1	1	1	1

Current medication	SABA only	4(5.6%)	67	1	1	1	1
	Oral corticosteroid only	0(0%)	1(1%)				
	ICS + LABA	(62.5%)	18(37.5%)	.036(.011-.115)	p<.001	.017 (.003-.087)	P<.001*
	SABA + ICS	46(28.75%)	114(71.24%)	.148(.051-.429)	p<.001	.047 (.011-.201)	P<0.001*
	Other	0	1				

(Educational status) Other: adult education, spiritual education. (Current asthma medication) other: oral steroid, ephedrine and must cell stabilizer

1. * $P < 0.25$ significant variables of bivariate analysis
2. ** $P < 0.05$ significant variables of multivariate analysis

6. Discussion

The long-term goal of asthma therapy is to reach and maintain well-controlled asthma. This can be achieved in a continuous assessment level of asthma control, treatment adjustment, and evaluation of response. The result of this study indicated that high prevalence of uncontrolled asthma (71.5%) [95%CI: (65.9%, 76.7%) $p = .011$] among adult asthma patient who attended SPHMMC chest clinic during the study period.

This study is one of the few studies assessing asthma control in SPHMMC chest clinic. A high proportion of patients had uncontrolled asthma (71.5%) [95%CI: (65.9%, 76.7%) $p = 0.011$] and the factors associated with uncontrolled asthma were comorbidity, irregular chest clinic follow-up, inappropriate MDI technique and current asthma medication.

This high prevalence of uncontrolled asthma may be explained by the fact that it was conducted in referral hospitals, which frequently see patients with more serious illnesses. Only 17.1% of the patients in this study used the recommended preventative drugs (SABA /LABA fixed combination), which suggests a possible link between the high prevalence of uncontrolled asthma and their underuse.

Similar research done in European nations 45%(54), Vietnam 33.2%(16), Italy 50.4%(55), Cameron 42% (17), had lower prevalence of uncontrolled asthma when compared to this study. This variation of asthma control may be the high level of knowledge of study participants, the availability of medical insurance for asthma medication(40), and the patient-performed lung function tests may be contributing causes to the observed variation in level of asthma control.

Study done in Sudan (84.5%)(23) and Nigeria (82.9%)(18) indicated that higher prevalence of uncontrolled asthma when compared to present study. This variation may be due to variation of study setting and study participant.

Research conducted in North Africa 71.3%(21), Jima (71.4%) (19), and in Addis Ababa 75.8%(20) showed that comparable finding with this study on prevalence of uncontrolled asthma. This similarity may result from the similarity of using the similar assessment tool.

In this study, having comorbidity (AOR 6.208, 95% CI 2.149-17.937, $p < 0.001$) was 6.20 times higher risk to have uncontrolled asthma. This aligns with research done in California on Predictors of Asthma Control, comorbidity was significantly associated with asthma control(56), Portugal, where patients with comorbidities had 5.6 more chance, to develop uncontrolled asthma than those with no comorbidity(57). Study conducted in Europe showed that comorbidity impose patient to uncontrolled asthma(13). Similarly study done at Armed Forces Referral and Teaching Hospital, Addis Ababa indicated that Patients with non-respiratory comorbidities had significantly worse asthma control (27). This association may be explained by if comorbidity was not controlled, it can affect directly or indirectly lung pathology. In contrast, study done in Brazil showed that one or more comorbidities identified were no significant association between the level of asthma control and the number of comorbidities, and a possible difference explanation for this finding was that these patients were under adequate treatment so that this common marker did not influence the asthma control status(33).

This study also indicated that having irregular follow-up (AOR 9.918, 95% CI 3.575-27.512, $p < 0.001$), was significantly associated with uncontrolled asthma. Similar findings were found in the Maghreb and Ethiopia, where people with improved asthma control had fewer doctor visits. This was a reflection of the fact that the majority of research participants only saw a doctor in the event of exacerbations, with just one-third of them reporting scheduled follow-up sessions (3,21)

Inappropriate Metered dose inhalation (MDI) technique also had significant association with uncontrolled asthma. This result agrees with the study from numerous investigations like study done in Italy(40), Saudi Arabia(14), Nigeria(18), Sudan(23), Gondor((46), and study done in Addis Ababa(47). This similarity may explain as inappropriate inhaler use could potentially result in decreased medicine delivery and effectiveness, which would then contribute to the uncontrolled asthma these patients experience.

Adherence to inhaled corticosteroids (ICS) is crucial for asthma control(34). In this study patient on short acting beta agonist (SABA) + inhaled corticosteroid (ICS) and inhaled corticosteroid (ICS) /long acting beta agonist (LABA) fixed combination asthma medication (Adjusted OR .017, 95%CI .003-.087, $p < .001$, Adjusted OR .047, 95%CI .011-.201, $p < .001$) was less likely to develop uncontrolled asthma respectively when compared to SABA only. This is in line with

GINA 2022 guide line recommendation which stated that for the best outcomes, ICS-containing treatment should be initiated as soon as possible after the diagnosis of asthma is made, because, Patients with even mild asthma can have severe exacerbations , Low dose ICS markedly reduces asthma hospitalizations and death(8). But in present study only 17.1% was treated with combined ICS/LABA asthma medication. This might be explained by the following: a lot of patients do not see asthma as a chronic disease, lack of understanding that asthma can be controlled with appropriate use of ICS, unavailability and unaffordability of ICS medication, or the treating physicians did not prescribe it(27,46).

Uncontrolled asthma has significant therapeutic implication. Some of the factors independently related to asthma control are modifiable by therapy and educations.

Strength of the study

One of this study's strength is that it is one of the few studies which used the ACT assessment tool, which has been validated, to report on the level of asthma control and related factors in the SPHMMC chest clinic.

Limitation of the study

It's possible that a cross-sectional study won't establish a true causal link between uncontrolled asthma and the contributing factors. And since the study was only undertaken in one institution, the findings may not be generalizable to patients from other centers. Furthermore pulmonary function test to confirm Asthma diagnosis was not done for some of the study participants although majority of them have established PFTs.

6.1. Conclusion

The current investigation revealed that significant prevalence of uncontrolled asthma in the SPHMMC chest clinic unit and identified risk factors that associated with uncontrolled asthma was comorbidity, inappropriate MDI technique, irregular chest clinic follow-up and current asthma medication.

6.2. Recommendation

For SPHMMC:

The hospital should follow the quality of health education delivery for the asthma patient at each follow up. And prepare post card on step of asthma medication inhaler device.

For Health care providers

In St. Paul's hospital millennium medical college, the prevalence of uncontrolled asthma was high. Consequently, in order to reduce the morbidity and expense of uncontrolled asthma, the treating physician, Respiratory therapists and nurses at the SPHMMC chest clinic should offer comprehensive health educations on controlling comorbidity, appropriate MDI technique, the need for regular chest clinic follow-up, and the importance of ICS inhalation during chest clinic at each follow-up visit.

For Researcher

To better understand asthma control challenges from the patient's perspective, such as non-adherence with therapy and impression of asthma control, more research is required.

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Assurance of principal investigator

I the under signed agree to accept all responsibility for the scientific and ethical conduct of the research project. I will provide timely progress report to my advisor and seek the necessary advice approval from my primary advisors in the course of the research. I will communicate timely to my advisors and all stake holders involved in study including any source of funding for this research.

Name of principal investigator: Yadesa Asfaw

Signature _____

Date _____

Approval of the primary advisor

Name of the primary advisor: Mr. Ermias Getaneh (Assistance professor)

Signature _____

Date _____

Approval of the co-advisor

Name of the co-advisor: Mr. Zerihune Alene Terefe (BSC ECCN, MSC in CCNP).

Signature _____

Date _____

Name of the primary examiner

Signature _____

Date _____

Name of the co-examiner

Signature _____

Date _____

Annex I: English questionnaires

St. Paul Hospital Millennium Medical College Graduate Study Program

Introduction

This structured questionnaire was prepared to assess level of asthma control and associated factors among asthma patient who attended Saint Paul's hospital millennium medical college (SPHMMC) Chest Clinic of Addis Ababa, Ethiopia, 2023.

Consent form

My name is YadesaAsfawand I am MSc student here in Sphmmc, department of intensive care medicine Respiratory therapy student. I'm working a research on the assessment of level of asthma control and associated factors among asthma patient who attend public hospital chest clinic in Addis Ababa during study period. I'm going to interview patients on their level of asthma control and associated factors among asthma patient who attend ofSPHMMC and TASH chest clinic.

I'M going to ask you some questions that could be important for heath organizations working on early asthma control and detection, management and preventions of asthma. Your name will not be written in this form and the information you give will be kept confidential. If you don't want to answer all of or some of the questions, you do have the right to do so. However your willingness to answer all of the questions would be appreciated.

Would you participate in responding to the questions in this questionnaire?

Yes ☐ No ☐ signature of participant's _____

Name of interviewer: ----- signature-----

Name of the supervisor ----- signature -----

Date of checking-----

Remark: 1. Complete 2. Incomplete

Questionnaire

I. Sociodemographic

Code: _____

Chart number: _____

1. Gender

- ☐ Male
- ☐ Female

2. Age In years

3 Marital statuses

- ☐ Single
- ☐ Married
- ☐ Divorced/Separated
- ☐ Widowed

4. Educational Status

- ☐ No formal education
- ☐ Primary school
- ☐ Secondary School
- ☐ College / University
- ☐ Other

5. Place of living (Residence)

- ☐ Urban
- ☐ Rural

6. Working status (Occupation)

- ☐ Government employee
- ☐ Private organization employee
- ☐ Housewife

- ☐ Merchant
- ☐ Student
- ☐ Unemployed
- ☐ Other

7. Monthly family Income _____ETB

8. BMI in kg/m²

- ☐ <18.5
- ☐ 18.5 to 25
- ☐ 25 to 30
- ☐ >30

II. Life style factors

9 What is your smoking status?

- ☐ Non-smoker (never smoked)
- ☐ Active smoker
- ☐ Passive smoker
- ☐ Past smoker

10 Do you have working area asthma triggers?Such as dust, bad or strong smell, cold weather, smoke, fumes, pollen or irritant

- ☐ Yes
- ☐ No

12 Do you have history of indoor/outdoor exposure in your life? Use of biomass fuel for cooking?

- ☐ Yes
- ☐ No

III. Comorbidity related factors

13 Obesity [BMI > 30]

- ☐ Yes
- ☐ No

14 Do you have heartburn (GERD) that requires treatment with medication?

- ☐ Yes
- ☐ No

15 Do you have recurrent episodes of runny nose and sneezing unrelated to cold symptoms?

- ☐ Yes
- ☐ No

16 Does the patient have any other comorbidity?

- ☐ Yes
- ☐ No

IV. Treatment related factors

18. How long has it been since your asthma was diagnosed?

19. Which asthma symptom disturbs you always? Which asthma symptom do you experience the most?

- ☐ Wheezing
- ☐ Cough
- ☐ Chest tightness/pain
- ☐ Shortness of breath

20. What is your current asthma medication?

- ☐ SABA only
- ☐ Oral corticosteroid only
- ☐ ICS + LABA
- ☐ SABA + ICS
- ☐ Other

21. Do you have regular chest clinic follow-up?

- ☐ Yes
- ☐ No

22. Do you have history of exacerbation of asthma symptom in past 12 month?

- ☐ Yes
- ☐ No

23. Have ever been admitted to the ER [emergency room] due to your asthma?

- ☐ Yes
- ☐ No

24. Have ever been admitted to the ICU due to your asthma?

- ☐ Yes
- ☐ No

V. Level of asthma control assessment (ACT tool)

1. In the past 4 weeks, how much of the time did your asthma keep you from getting as much done at work, school or at home?

- ☐ All of the time [1]
- ☐ Most of the time [2]
- ☐ Some of the time [3]
- ☐ A little of the time [4]
- ☐ None of the time [5]

2. During the past 4 weeks, how often have you had shortness of breath?

- ☐ More than once a day [1]
- ☐ Once a day [2]
- ☐ 3 to 6 times a week [3]
- ☐ Once or twice a week [4]
- ☐ Not at all [5]

3. During the past 4 weeks, how often did your asthma symptoms (wheezing, coughing, and shortness of breath, chest tightness or pain) wake you up at night or earlier than usual in the morning?

- ☐ 4 or more nights a week [1]
- ☐ 2 to 3 nights a week [2]
- ☐ Once a week [3]
- ☐ Once or twice[4]
- ☐ Not at all [5]

4. During the past 4 weeks, how often have you used your rescue inhaler or nebulizer medication (such as albuterol)?

- ☐ 3 or more time per day[1]
- ☐ 1 to 2 time per day [2]
- ☐ 2 or 3 time per week [3]
- ☐ Once a week or less [4]
- ☐ Not at all

5. How would you rate your asthma control during the past 4 weeks?

- ☐ Not controlled at all[1]
- ☐ Poorly controlled [2]
- ☐ Somewhat controlled[3]
- ☐ Well- controlled [4]
- ☐ Completely controlled [5]

MDI Technique

Correct step of inhalation technique for MDI [tick] IDAT check list

- ☐ Remove mouthpiece cap
- ☐ Shake inhaler (suspensions only)
- ☐ Breathe out before firing
- ☐ Inhales appropriately-release 1 puff and continues breathing in slowly for about 5 second
- ☐ Hold breath for 10 second

Correct steps of inhalation technique for DPI

- ☐ Remove or turn cover
- ☐ Load dose

- ☐ Place mouthpiece between lips
- ☐ Breathe out the device mouthpiece
- ☐ Forcefully and deep inhalation
- ☐ Breath-hold for 10 second

This check list is adapted from (30,40)

Annex 2: Amharic questionnaires

የቅዱስጳውሎስ ሆስፒታል ሚኒስቴር የምርመራ ክልሎች የድህረ ምረቃ ፕሮግራም

መግቢያ

ይህ የተዋቀረ መጠይቅ የተዘጋጀው በጥናት ወቅት በአዲስ አበባ በሕዝብ ሆስፒታል ደረት ክሊኒክ የሚከታተሉ የአስም ሕመም ተኞች የአስም መቆጣጠሪያ ደረጃ እና የደም ፍሰት ምክንያቶችን ለመገምገም ነው።

የፍቃድ ቅፅ

ያዳሳ አስፋው እባላለሁ እዚህ የቅዱስጳውሎስ ሆስፒታል ሚኒስቴር የምርመራ ክልሎች የድህረ ምረቃ ፕሮግራም የፅኑ እንክብካቤ ሜዳሲን ክፍል የመተንፈሻ ህክምና ተማሪ ነኝ። በአዲስ አበባ በሕዝብ ሆስፒታል ደረት ክሊኒክ ውስጥ በክትትል ለይደሉ አስም ታማሚዎች የአስም መቆጣጠሪያ ደረጃ እና የደም ፍሰት ምክንያቶች ላይ ጥናት እያደረግሁ ነው። በSPHMMC እና TASH ደረት ክሊኒክ ውስጥ በክትትል ለይደሉ የአስም ሕመም ተኞች መካከል የአስም መቆጣጠሪያ ደረጃቸው እና የደም ፍሰት ምክንያቶች ላይ ለታካሚዎች ቃለ መጠይቅ አደርጋለሁ።

አስቀድሞ የአስም በሽታን ለመቆጣጠር እና ለመለየት፣ የአስም በሽታን ለመከላከል ለሚሰሩ ለጤና ተቃዋሚዎች ሚኒስቴር የሚሰጡ ስምዎችን ልጠይቅ ነው። ስምዎ በዚህ ቅጽ አይጻፍም እና የሚሰጡት መረጃ በሚስጥር ይጠበቃል። ሁሉንም ወይም አንዳንድ ጥያቄዎችን መመለስ ከፈለግክ/ሽ፣ ይህን ለማድረግ መብት አለህ/ሽ። ነገር ግን ሁሉንም ጥያቄዎች ለመመለስ ፈቃደኝነትዎ አድናቆት ይኖረዋል።

በዚህ መጠይቅ ውስጥ ለቀረቡት ጥያቄዎች ምላሽ በመስጠት ይሳተፋሉ?

አዎ የለም የተሳታፊው ፊርማ _____

የቃለ-መጠይቅ አድራጊው ስም፡----- ፊርማ-----

የሱፐርቪዘር ስም ----- ፊርማ -----

የተረጋገጠበት ቀን -----

አስተያየት፡- 1. ሙሉነው 2. ያልተሟላ

ክፍል አንድ፡- ሰሺዮዲሞግራፊያዊ ሁኔታዎች

1. ጾታህ. ወንድህ. ሴት

2. ዕድሜ _____

3. የጋብቻ ሁኔታ

ሀ. ነጠላላ. ያዘጋገቡ. የፋታ/ች/የተለያዩ. ባልየሞተባት

4. የትምህርት ደረጃ

ሀ. ያልተማረላ. የመጀመሪያ ደረጃላ. ሁለተኛ ደረጃ ትምህርትም. ከፋተኛ ትምህርት

5. የመኖሪያ ቦታህ. ከተማላ. ገጠር

6. የሥራ ሁኔታ

ሀ. ገበሬላ. የቤት እመቤትላ. ነጋዴመ. ለመንግስት ተቀጥሮ የሚሰራሽ. ሌሎች _____

7. በወር ገቢ

ሀ. <2000 ብርላ. 2000-5000 ብርላ. > 5000 ብር

8. BMI (ኪ/ግ / ሜ 2).

ሀ. < 18.5 ኪ/ግላ. 18.5-24 ኪ/ግላ. 25 -30 ኪ/ግሙ. > 30 ኪ/ግ

ክፍል ሁለት፡ የሕይወት ዘመን ሁኔታዎች

9. የማጭነት ሁኔታዎች ንድምስ ስላል?

ሀ. አሁን አጭሽ ነኝላ. ቤት ውስጥ የሚያጭስሰው አላለሁ. በህይወት ውስጥ በጭራሽ አያጭስም
መ. ዲሮ አጭሽ ነበርኩ

10. የስራ አካባቢ አስምቀስቃሽዎቹ አሉዎት? እንደ

(አቢራ፣ መጥፎ ወይም ጠንካራ ሽታ፣ ከቀዝቃዛ የአየር ሁኔታ ጋር የተያያዘ፣ ጭስ፣ ሌሎች

(ጭስ፣ የአበባ ዱቄት እና የሚያበሳጭ)።

ሀ. አዎላ. አይደለም

11. አዎ ከሆነ ከመካከላቸው አስምዎን የሚያነሳሱት የትኞቹ ናቸው? (አንድ እና ከዚያ በላይ ቀስቃሽ ልኖር ይችላል).

ሀ. አቢራ፣ መጥፎ ወይም ጠንካራ ሽታ

ለ. ከቀዝቃዛ የአየር ሁኔታ ጋር የተያያዘ D. ማጭነት. ሌሎች (ጭስ፣ የአበባ ዱቄት እና የሚያበሳጭ)

12. በህይወት ውስጥ የቤት ውስጥ / ከቤት ውጭ ለጭስ የመጋለጥ ታሪክ አለዎት? ለማብሰል የባዮማስ/

ነዳጅ መጠቀም?

ሀ. አዎላ. አይደለም

ክፍል ሶስት፡ ከበሽታ ጋር የተያያዙ ምክንያቶች

13. BMI > 30 ኪ/ግ/ሜ² ሆኖ ሆኖ ሆኖ አለህ፡፡ አዎ ሊሆን ይችላል፡፡ አይ

14. (GERD) መድኃኒት የሚያስፈልገው የጨጋራ ህመም አለህ? ሀ. አዎ ሊሆን ይችላል፡፡ አይደለም

15. ከጉንፋን ምልክቶች ጋር የተያያዙት ደጋጋሚ የፍጥነት ማስጠንቀቂያ ምልክቶች አሉዎት?

ሀ. አዎ ሊሆን ይችላል፡፡ አይደለም

16. የካርዲዮቫስኮላር በሽታዎ? _____

ክፍል አራት፡ ከህክምና ጋር የተያያዙ ምክንያቶች

17. ባለፉት 12 ወራት ውስጥ የአስም ምልክቶችን የመባባስ ታሪክ አለዎት?

ሀ. አዎ ሊሆን ይችላል፡፡ አይደለም

18. አሁን ያለዎት የአስም መድኃኒት ምን ድንገት?

ሀ. SABA ብቻ ሲያጠቃም ወደ ካርዲዮሎጂ ተሽጦ ሲሆን ይታወቃል፡፡ ICS እና LABA ም. SABA እና ICS

ሰ. ሌሎች መድኃኒቶች ከሉ _____

19. መደበኛ የደረት ክሊኒክ ክትትል ወይም ያልታወቀ ደግሞ ብቻ አለህ?

ሀ. አዎ ሊሆን ይችላል፡፡ አይደለም

20. አስምዎ ከታወቀ ምን ያህል ጊዜ ነው? _____

21. ከዚህ ቀደም በድንገተኛ ክፍል ውስጥ የአስም በሽታ መታከም ታሪክ አለዎት?

ሀ. አዎ ሊሆን ይችላል፡፡ አይደለም

22. በአስምዎ ምክንያት ከፍተኛ እንክብካቤ ክፍል ገብተዋል?

ሀ. አዎ ሊሆን ይችላል፡፡ አይደለም

23. የትኞቹ የአስም ምልክቶች ሁልጊዜ ይረብሹዎታል?

ሀ. ጩኸት ሊሆን ይችላል፡፡ ሳልሉ፡፡ የደረት መጨናነቅ/ህመም መጨናነቅ፡፡ የትንፋሽ ማጠር

ክፍል አምስት፡ የ ACT መሳሪያን በመጠቀም የአስም መቆጣጠሪያ ማግኘት ደረጃ፡፡

24. የአስም በሽታ መዲሐን ትንበት ክፍል የመተንፈስ ዘዴ ችሎታ አለህ?

ሀ. አዎ ሊሆን ይችላል፡፡ አይደለም

የአስም መቆጣጠሪያ ማግኘት ደረጃ (ACT መሳሪያ)

1. ባለፉት 4 ሳምንታት አስምዎበስራ፣ በትምህርት ቤት ወይም በቤት ውስጥ ብዙ እንዳትሰራ የከለከለዎት ስንት ጊዜ ነበር?

- ☐ ሁልጊዜ [1]
- ☐ ብዙ ጊዜ [2]
- ☐ አንዳንድ ጊዜዎች [3]
- ☐ ከትንሹ ጊዜ [4]
- ☐ ምንም ጊዜ የለም [5]

2. ባለፉት 4 ሳምንታት ውስጥ ምን ያህል ጊዜ የትንፋሽ እጥረት አጋጥሞዎታል?

- ☐ በቀን ከአንድ ጊዜ በላይ [1]
- ☐ በቀን አንድ ጊዜ [2]
- ☐ በሳምንት ከ3 እስከ 6 ጊዜ [3]
- ☐ በሳምንት አንድ ወይም ሁለት ጊዜ [4]
- ☐ በፍጹም [5]

3. ባለፉት 4 ሳምንታት የአስምምልክቶችዎ (ምትክ፣ ማሳልእና የትንፋሽ ማጠር፣ የደረት መጨናነቅ ወይም ህመም)

በሌሊት ወይም በጠዋት ከወትሮ ውቅያኖስ ጋር ምን ያህል ጊዜ ከእንቅልፍዎ ይነቁዎታል?

- ☐ በሳምንት 4 ወይም ከዚያ በላይ ምሽቶች [1]
- ☐ በሳምንት 2-3 ምሽቶች [2]
- ☐ በሳምንት አንድ ጊዜ [3]
- ☐ አንዴ ወይም ሁለት [4]
- ☐ በፍጹም [5]

3. ባለፉት 4 ሳምንታት፣ የእርስዎን የማዳኛ እስትንፋስ ወይም ኔቡላይዘር መድኃኒት (እንደ አልቡኬሮል ያሉ)

ምን ያህል ጊዜ ተጠቅመዋል?

- ☐ በቀን 3 ወይም ከዚያ በላይ ጊዜ [1]
- ☐ በቀን 1-2 ጊዜ [2] ☒ በሳምንት 2 ወይም 3 ጊዜ [3]
- ☐ በሳምንት አንድ ጊዜ ወይም ከዚያ በታች [4]
- ☐ በጭራሽ

5. ባለፉት 4 ሳምንታት የአስም መቆጣጠሪያዎን እንዴት ይመዝኑታል?

- ☐ ምንም ቁጥጥር አልተደረገም [1]
- ☐ ደካማ ቁጥጥር [2]
- ☐ በተወሰነ ደረጃ ቁጥጥር የሚደረግበት [3]

☐ በደንብቁጥጥር [4]

☐ ሙሉ በሙሉ ቁጥጥር የሚደረግበት [5]

ክፍል ስድስት፡

የደረጃ በደረጃ MDI እና DPI ትክክለኛ የመተንፈስ ቴክኒክ ዝርዝር፡፡

- የአፍ መጨመር ይካተታል
- መንቀጥቀጥ Inhaler (እገዳዎች ብቻ) 5
- ከመተኮሱ በፊት ይተንፍሱ
- በትክክል ወደውስጥ ይተንፍሳል -
- 1 ፓፍ ይልቅ እና ለ 5 ሰከንድ ያህል በቀስታ መተንፈሱን ይቀጥላል 5
- ለ 10 ሰከንድ ያህል ትንፋሽ ይያዙ

ለዲፕሎማ የመተንፈስ ቴክኒክ ትክክለኛ ደረጃዎች

- ☐ ሽፋኑን ያስወግዱ ወይም ይቀይሩ
- ☐ የመጨረሻ መጠን
- ☐ የአፍ መፍቻውን በከንፈሮች መካከል ያስቀምጡ
- ☐ የመሳሪያውን አፍ መተንፈስ
- ☐ በጋራ እና በጥልቀት ወደውስጥ መተንፈስ
- ☐ ለ 10 ሰከንድ መተንፈስ ይህንኑ ዝርዝር

ይህ የፍተሻ ዝርዝር ከ (30,40) የተቀረነው