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## Effect of self-care management protocol on controlling patients with asthmatic disease

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### Abstract

**Background:** Asthma is a complex chronic disease affecting patients of all ages. Poor control of asthma symptoms is associated with higher frequencies of exacerbation and comorbidities. With efficient control on asthma, the undesirable effects of asthma can be prevented, and the individual can have a normal and healthy life.

**Objective:** Evaluate the effect of self-care management on controlling patients with asthmatic disease.

**Sample:** A purposive sample of sixty-five adult asthmatic patients (male and female).

**Tools:** Two tools were used.

**First Tool:** Patient's Health Assessment sheet: includes two parts.

**First Part:** Socio-demographic data.

**Second Part:** History and current medical data.

**Second Tool:** Asthma Control Questionnaire (ACQ).

**Results:** Majority of the patients did not control their asthma. After one month from application of self-care management education, more than half of the study subjects had well controlled asthma, and half of the study subjects had moderately controlled asthma on follow up after 3 months.

**Conclusion:** Based upon the results of this study, it could be concluded that the implementation of self-care management education affected positively and helped in improving disease control and patient outcomes of asthmatic patients compared to pre-self-care management education implementation.

**Recommendation:** Continuity of asthma self-management programs with an emphasis on management behaviors, particularly the avoidance of asthmatic triggers and the control of asthma attacks; expands the study to include a wider sample from other regions to draw broader conclusions.

**Keywords:** Asthma control, asthmatic patients, self-care management

### Introduction

Globally, asthma ranks 28<sup>th</sup> among the most common diseases and 16<sup>th</sup> among the most common causes of living with a disability. Bronchial hyperactivity and varying degrees of obstruction of the airway are common characteristics of asthma. It is considered one of the most common chronic inflammatory airway diseases which impacts three hundred million people globally. About 250,000 individuals die each year from asthma. Shortness of breath, chest tightness, wheezing, limitation of airflow and continuous coughing are common symptoms of asthma. These symptoms are commonly most severe at night and early in the morning. In response to allergens such as pollens, dust, smoke, occupational irritants, molds, and strong odors, these symptoms manifest. Stressful situations, chilly temperatures, and exercise are examples of non-allergen triggers that can elicit asthma attacks<sup>[1-3]</sup>.

Asthma attacks are caused by the release of inflammatory mediators such as histamine, leukotrienes, prostaglandins, and nitric oxide in response to allergens or irritants within 30 to 60 minutes after exposure. Three common things may occur during an asthma exacerbation: First thing is inflammation, which causes the lining of the airways to swell. Second is bronchoconstriction, in which the muscles around the airways tighten, narrowing the airways? Third is increased mucus production. This leads to airway obstruction. During exacerbation of asthma, airways are obstructed so that oxygen cannot reach the lungs. Additionally, this inhibits oxygen from reaching the body's essential organs through the bloodstream. Patients experiencing severe asthma exacerbations need to be admitted to the hospital immediately, as these kinds of attacks can be lethal. On the same time, carbon

dioxide poisoning may occur because of CO<sub>2</sub> builds up in the lungs<sup>[4-6]</sup>.

Medication for asthma can be either long-term control or quick relief. Medication for long-term treatment of asthma can lessen inflammation in the airways and minimize asthma symptoms. To alleviate asthma symptoms and to counteract bronchodilation during severe asthma exacerbation, quick-relief or "rescue" medications are administered. On-pharmacological asthma management is an additional therapeutic option that attempts to better control asthma symptoms or completely prevent the disease. Main components of non-pharmacological actions include managing one's environment (Avoiding asthma trigger), exercising, breathing exercises, smoking cessation, being vaccinated against influenza, losing weight, and managing mental health issues like anxiety and depression<sup>[5, 7, 8]</sup>.

Achieving adequate asthma control is the goal of asthma treatment to decrease the burden of symptoms and the risk of asthma attacks. When a patient's asthma symptoms are either no longer present or have been significantly alleviated because of treatment, we say that their asthma is well-controlled. Level of asthma control is determined and depends on interaction between the patient's environment, psychosocial issues, underlying illness processes, current treatment, genetics. The two domains of asthma control are control of symptoms and the potential negative consequences in the future<sup>[3, 9]</sup>.

Four essential components of care are necessary for achieving and keeping better asthma control include; First component is continuous assessment and strict monitoring; Second is focus on the importance of collaborative approach to care especially relatives; Third is management and control of environmental triggers; and the last component is management of coexisting diseases impacting asthma and its pharmaceutical regimen. Asthma control aims to lessen impairment by preventing chronic and troublesome symptoms (e.g. coughing or shortness of breath in the daytime, at night, or after heavy work), requiring little use of inhaled short-acting beta-agonists (SABA), no more than 2 times per week, to alleviate symptoms quickly and maintaining normal lung function, maintaining normal activity levels (including exercise, other physical activity, and attendance at work), and meeting the expectations and satisfaction of patients and their families with asthma care<sup>[8]</sup>.

Asthma is a chronic disease, and people suffering from it must learn to adapt to its long-term condition throughout their lives. Maintaining a steady medication regimen, an ample supply of inhalers, avoiding asthma triggers whenever possible, and learning to live with the unpredictable nature of the disease and its effects on daily life can all be challenges for those living with asthma and their families. Most importantly, asthmatic individuals need to be able to identify when their asthma is getting worse and being able to decide when to modify their drugs, correct time for using emergency medications, and when to consult a specialist<sup>[10]</sup>.

Even though there is no cure for asthma, it can be controlled, and exacerbations can be avoided with the help of good patient education and self-care. One way to improve one's quality of life and keep their psychosocial functioning at acceptable levels is through self-management, which is taking charge of one's daily actions and learning new skills. The term "self-management" can also refer to acquiring the

information and essential skills needed to have a fulfilling life while suffering from a long-term health condition<sup>[11, 12]</sup>. Self-management education is an essential component. It is the responsibility of every healthcare provider working with asthma patients to provide everyone with individualized recommendations for how to better manage their condition on their own. Asthma self-management aims to improve lung function, increase quality of life, and control symptoms overall. Lessening the frequency and severity of asthma attacks should lead to better control of the disease, which in turn should improve the patient's quality of life, decrease healthcare expenditures, delay the inflammatory remodeling of the airways, decrease morbidity, minimize hospitalizations and emergency room visits and decrease the risk of asthma-related death<sup>[13, 14]</sup>.

### Significance of the Study

The prevalence of asthma is alarming and affects both industrialized and developing economies. In terms of disability-adjusted life years, asthma ranks as the sixteenth greatest cause of years lived with disability and the twenty-eighth leading cause of the disease burden on a global scale<sup>[15, 16]</sup>. According to the 2023 Global Initiative for Asthma (GINA) report, asthma prevalence ranged from 1 to 29% in various nations, and over 339 million people globally had asthma<sup>[17-19]</sup>.

250,000 people die each year from asthma, mostly in poor and medium income economies. Asthma is estimated to be four hundred million cases by 2025. Moreover, twenty-seven million Americans, or 7.7% of the American population, suffer with asthma. This amounts to around one out of every twelve asthmatic individuals<sup>[20]</sup>. In Egypt, asthma is estimated to be 8.2% and 6.7% among children and adults respectively, being more predominant in males than females (1.2:1)<sup>[21-23]</sup>.

Asthma patients are crucial and mostly to blame for the under treatment and mismanagement of their condition. The patient will not be able to take full advantage of the offered facilities to their full potential unless they have basic information about the fundamentals of managing bronchial asthma. Though my experience as a clinical instructor working in different departments at Minia university chest hospital, I observed that many asthmatic patients have poor control over their disease, and this is reflected negatively in all aspects of activities of daily living. I noticed that many patients lack necessary knowledge and skills essential for better asthma control. When patients have good knowledge and practice about bronchial asthma management, they will be able to control asthma and achieve a better quality of life.

### Subject and Method

**Aim of the study:** The present study aimed to evaluate the effect of self-care management on controlling patients with asthmatic disease.

### Research Hypothesis

**H1:** Self-care management program will affect positively on asthma control of asthmatic patients.

### Operational Definition

- **Self-management:** It has been defined according to British Thoracic Society<sup>[14]</sup> as the tasks that individuals must undertake to live with chronic conditions including, "having the confidence to deal with medical

management, role management and emotional management of their conditions". The medical components of living with a changeable condition have been the focus of self-management in the context of asthma, with an emphasis on the significance of identifying and responding to symptoms and indicators of worsening.

- **Asthma Control:** It is the extent to which the manifestations of asthma can be observed in the patient or have been reduced or removed by treatment [3].

### Research Design

A quasi-experimental (QE) research design was utilized in the current study.

### Setting

The current study was conducted at Minia University Cardiothoracic Hospital in the inpatient Chest Department and followed up in the Chest Outpatient Clinic. Minia University Cardiothoracic Hospital belongs to the Minia University Hospital in Minia City, Egypt. The first floor is used by the inpatient chest department, which has four rooms with eight to ten beds: two rooms for adult males and two rooms for adult females. Additionally, there is a chest outpatient clinic on the first floor, which includes an examination room.

### Subject

A purposive sample of sixty-five adult asthmatic patients (male and female). All of them included in this study with the following inclusion and exclusion criteria:

#### Inclusion criteria

Patient has mild and moderate asthma control with previous asthma exacerbations, age (18 and 65 years old), specialists' confirmation of the patients' asthma, willing to participate and able to communicate with others, and free from immunocompromised disease.

#### Exclusion criteria

Patients with mental handicapped, being absent from educational classes for two or more sessions, or participating in other similar educational programs.

#### Sample size

It was planned that the sample would be collected period of 12 months according to the above-mentioned inclusion and exclusion criteria.

#### Study duration

Data collection started from September 2020 to August 2021.

#### Tools of data collection

The current study data were collected by using two tools. These tools were developed by the researchers after revising an extensive relevant literature review [5, 24] and reviewed by a panel of five experts. These tools are as follows:

#### First Tool: Patient's Health Assessment sheet: It includes two parts

**First Part:** Socio-demographic data sheet was developed by the researchers. Covering the following: Patient's age, sex, phone number, marital status and level of education,

occupation, and socioeconomic status.

**Second Part:** It covered past history and current medical data of the patient:

- a. Past history such as family history of asthma, smoking, duration of bronchial asthma, severity of asthma, inhaler devices (type, duration, and frequency), hospitalization during last year due to the disease, and asthma triggers.
- b. Current Medical data as: date of admission, time of follow up, daily activities, medications used, presence of co-morbid medical illness and body mass index (BMI).

The International classification of adult underweight, overweight and obesity according to BMI as follow: underweight if  $< 18.5$ , normal weight from 18.5-24.9, overweight (pre-obese) from 25-29.9, and obese class I from 30-34.9, obese class II from 35-39.9 and obese class III  $\geq 40$ . BMI = Body weight (kg)/(Height in meters) [2, 25].

#### Second Tool: Asthma Control Questionnaire (ACQ)

Asthma Control Questionnaire (ACQ), which was first developed by Juniper *et al.* [26] Questionnaire for asthma control is very brief for the benefit of evaluating the degree of the degree of patient's control on their asthma. Also, ACQ helps in judging any change on patients' asthma control occurs naturally or as a result of treatment plan. Five questions on asthma symptoms, one on rescue medication ( $\beta_2$ -agonist), and the last one on the predicted percentage value of forced expiratory volume in the first second (FEV1) make up the seven items of the asthma control questionnaire (ACQ). On a 7-point scale, patients are asked to remember their asthma symptoms and bronchodilator use over the past week. As well as, on a 7-point scale, the predicted FEV1% is scored by the clinic personnel.

#### Scoring system

The ACQ score ranges from 0 (completely controlled) to 6 (totally uncontrolled), with each question carrying equal weight. The researchers calculate it by averaging the results of all seven questions. Well-controlled asthma is scored between (0.0 and 0.75); moderately controlled asthma falls into the gray zone between ( $>0.75$  and 1.5); and poorly controlled asthma falls into the 1.5+ range [27].

**Educational asthma control booklet:** It was prepared by the researchers based on knowledge and skills needs. It was supplemented with information based on review of relevant literature about bronchial asthma [5, 24]. The booklet reviewed by supervisors, and it consists of two parts:

**Theoretical part covered:** Introduction about the disease, definition of bronchial asthma, asthma triggers, signs and symptoms, complications, prevention, medication, actions during asthma exacerbations.

**Practical part covered:** Using several types of inhalers and nebulizer, breathing and coughing exercise, diaphragmatic breathing, oral care, and also self-care strategies in case of any related problems as: orthopnea, shortness of breath, cyanosis, chest pain and cough.

The researcher used language in a simple form to be convenient to the patients' level, with motivation and

reinforcement to enhance learning. All the studied sample who took part in the study were given an Arabic-language booklet as a guide for them throughout their lives. For assisting patients and their families in comprehending the contents of the booklet, it was accompanied by several photos and illustrations.

### Tools Validity

The developed study tools were submitted to a jury of five experts specializing in the fields of Medical Surgical Nursing to test their content clarity and validity of items. All jury members agreed that the current study tools were valid and relevant to the research aim.

### Tool Reliability

The reliability of the study tool was statistically confirmed using the Alpha Cronbach test. Reliability of Asthma Control Questionnaire was (0.922).

### Pilot study

A pilot study was carried out on 10% (n = 6) of the total sample of patients admitted to the previously mentioned setting, meeting inclusion criteria to test the applicability, clarity, and objectivity of the study tools and estimate the time required for fulfilling it.

### Ethical Considerations

The study was granted permission to proceed by the following individuals: the head nurse of the unit, the academic for research center and technology, the director of Minia University Cardiothoracic Hospital, the dean of the faculty of nursing at Minia University, and the ethical committee of research. All the patients who took part in this study provided their informed consent after receiving detailed information about its aim, methods, advantages, and the nature of the study. They were also given the freedom to decline participation or withdraw at any moment without explanation. After explaining that their data will not be used for any future studies without their explicit permission, researchers were able to get their informed oral consent. Coding and security measures ensured that all obtained data remained confidential and undetectable for each subject.

### Study Procedure

#### Preparatory Phase

The researchers carried out the present study after formal authorization was achieved, tools were prepared through reviewing the current and relevant related literature and theoretical knowledge of the various related aspects using textbooks, and articles, and it ended by carrying out the pilot study.

#### Implementation Phase

1. The researchers have begun a collection of data from study subjects by obtaining patient's sociodemographic and medical data from patient by using (Tool I) patient health assessment sheet, Tool II: Asthma control

questionnaire on the first day. The implementation time for this tool was (1 hour).

2. The researchers prepared places for training, instructional materials, and media (computer, Photos, and booklet).
3. Educational protocol was conducted to study subjects through discussion, demonstration, and re-demonstration. Groups of patients were created based on their age and educational level.
4. The program was implemented by offering five educational sessions classified into two sessions for the theoretical part and three sessions for the practical part. Each session lasted for 20-30 minutes including face to face lectures, video, and demonstration firstly by the researcher and then let the patient re-demonstrate skills.
5. An educational asthma control booklet prepared by the investigator was given to each study subject to ensure that they will perform exercises accurately after being discharged from the hospital.

### Evaluation Phase

- In which the researchers were followed up for patients two times 1<sup>st</sup> follow up (post one month) and 2<sup>nd</sup> follow up (post 3 months) from implementation of asthma self-care management protocol.
- Multiple phone calls were done to monitor how the patient's condition is developing.
- The Pre-test and Post-test scores were compared to evaluate the effectiveness of the self-care management program.

### Limitations of the study

Because the sample was drawn from a single geographic region of Egypt, the results are less suited for broad generalization. Few national research has been conducted regarding the relation between the application of self-care management protocol and asthma control. A number of the patients who took part in the study were incapable of reading or writing, so we provided them with assistance and explanation as they answered the questionnaires. Due to the goal of raising patient awareness, several lectures were shortened to alleviate the boredom of the study subjects.

### Statistical analysis of data

Researchers used SPSS for Windows 25.0 (SPSS, Chicago, IL) to run all our statistical tests. The mean  $\pm$  standard deviation (SD) was used to express continuous data that followed a normal distribution. Frequency and percentage were used to express the categorical data. Variables compared with categorical data were evaluated using a chi-square test. We used the Repeated ANOVA test for repeated measurements with continuous data to find the comparisons. To evaluate the connections between the numerical variables, we utilized Pearson correlation analysis. We set the level of statistical significance at  $p < 0.05$ .

### Results

**Table 1:** Sociodemographic characteristics of the study sample (N=65)

Items	No	%
<b>Age group (Years)</b>		
20:30	7	10.8
31:50	28	43.1
51:65	30	46.1
Mean age $\pm$ SD.	48.969 $\pm$ 10.474	
Min.	27	
Max.	65	
<b>Gender</b>		
Male	47	72.3
Female	18	27.7
<b>Marital status</b>		
Married	58	89.2
Not married	7	10.8
<b>Occupation</b>		
Hand craft (industry)	28	43.1
Farmer	19	29.2
Housewife	18	27.7
<b>Education</b>		
Illiterate	6	9.2
Read& write	12	18.5
Secondary	26	40
Higher education	21	23.3
<b>Residence</b>		
Rural	39	60
Urban	26	40
<b>Economic status</b>		
Low (up to 1500 pound)	24	36.9
Moderate (3000 pound)	41	63.1

Table 1 showed that the mean age of the study sample was  $48.969 \pm 10.474$ . Concerning gender, the results revealed that the majority of the study sample (72.3%) were males. As regards marital status, the results revealed that the majority of the study sample (89.2%) were married. Concerning occupation, the study data demonstrated that less than half of the study subjects (43.1%) were

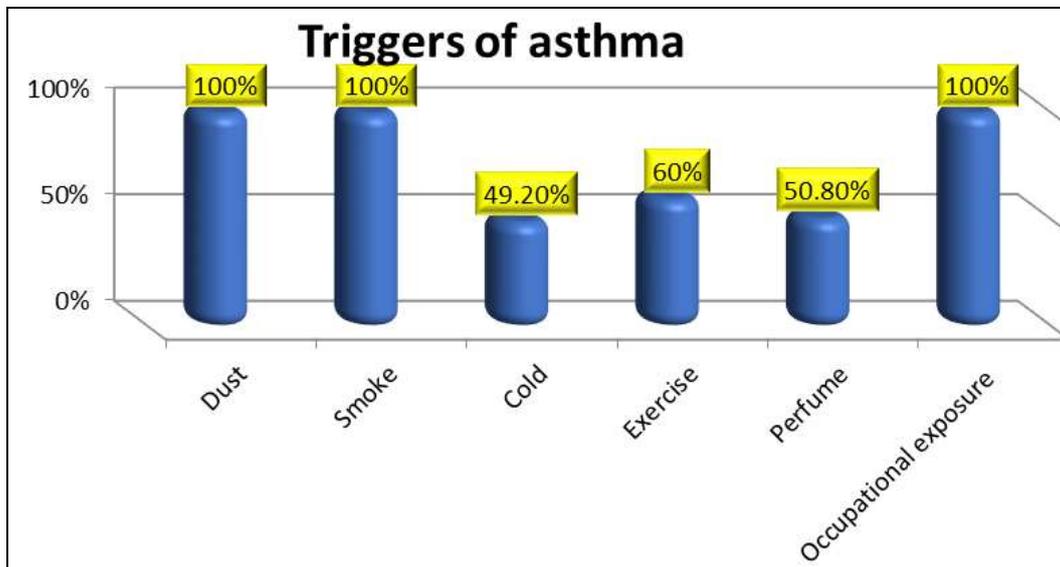
handcrafters (industry), and about one third of the study subjects (29.2%) were farmers. Concerning educational level, the study data demonstrated that less than half of the study subjects (40%) had secondary education. In respect to residence, the results revealed that more than half of the study subjects (60%) lived in rural areas.

**Table 2:** Distribution of the study sample regarding their past history (N=65)

Items	No	%
<b>Smoking history</b>		
Active	13	20
Passive	34	52.3
Non-smoker	18	27.7
<b>Years of smoking (N=47)</b>		
5-10 yrs.	14	29.8
11-20 yrs.	20	42.6
>20 yrs.	13	27.6
Mean $\pm$ SD	16.234 $\pm$ 1.280	
<b>Relatives complaining of asthma</b>		
First degree	32	49.2
Second degree	12	18.5
Not present	21	32.3
<b>Receiving health education about controlling asthma</b>		
Yes	20	30.8
No	45	69.2

Table 2 illustrated that more than half of the study subjects (52.3%) were passive smokers, and the mean years of smoking were  $16.234 \pm 1.280$ . In respect to receiving health

education, the results revealed that the majority of the study subjects (69.2%) had not received any educational program previously.



**Fig 1:** Distribution of the study sample regarding their asthma triggers (N = 65)

Figure 1 showed that all study subjects developed asthma symptoms when they were exposed to smoke or dust. Also, more than half of the study subjects (60%) developed asthma symptoms when they practiced heavy exercise.

**Table 3:** Distribution of the study sample regarding their current medical data (N=65)

Items	No	%
<b>Duration of the disease (Years)</b>		
< 5	7	10.8
5:10	21	32.3
>10	37	56.9
Mean duration ± SD. Min.-Max	14.200 ± 6.6973 3 - 29	
<b>Daily activities</b>		
Mild	14	21.5
Moderate	30	46.2
Highly	21	32.3
<b>Body mass index (Kg/m<sup>2</sup>)</b>		
Under weight	7	10.8
Normal	14	21.5
Overweight	32	49.2
Obese	12	18.5
Mean BMI ± SD	26.432 ± 4.971	
<b>Types of inhaler Device</b>		
PMDI (Pressure Metered Dose Inhaler)	39	60.0
Aerolizer	13	20.0
diskus	13	20.0
<b>Frequency of inhaler device every day</b>		
Once	20	30.8
Twice	27	41.5
Three times	12	18.5
Four times	6	9.2
<b>Food sensitivity</b>		
Yes	39	60.0
No	26	40.0
<b>Severity of Disease by FEV1 Criteria</b>		
Mild (More than or equal 80% predicted value)	26	40.0
Moderate (61 to 79% predicted value)	39	60.0

Table 3 revealed that more than half of the study subjects (56.9%) suffered from asthma more than 10 years ago, and the mean duration of the disease was 14.200 ± 6.6973. As regards daily activity, the results revealed that almost one third of the study sample (32.3%) was highly active. Concerning body mass index (BMI), the study data

demonstrated that less than half of the study subjects (49.2%) were overweight, and the mean BMI was 26.432 ± 4.971. Regarding the types of inhaler devices used, the results mentioned that almost two-thirds of the study subjects (60%) used PMDI inhaler devices. In respect to frequency of use of the inhaler device, the study data

demonstrated that less than half of the study subjects (41.5%) used the inhaler device twice daily. Concerning the severity of disease, the results revealed that less than two-

thirds of the study subjects (60%) had moderate disease severity.

**Table 4:** Distribution of the study sample regarding presence of co-morbid medical illness (N=65)

Items	Yes		No	
	Yes	No %	Yes	No %
Diabetes Mellitus	19	29.2	46	70.8
Hypertension	20	30.8	45	69.2
Cardiac disease	20	30.8	45	69.2
Gastro-intestinal disease	0	0	65	100
None	33	50.8	32	49.2

As clear from the above table (Table 4), (30.8%) of asthma patients complained from more than one chronic disease at the same time.

**Table 5:** Frequency and percentage distribution of study sample according to Asthma Control Levels (N=65)

Asthma Control Levels	Pretest		Post 1		Post 2		Significance
	No	%	No	%	No	%	
Well controlled asthma (0.0- 0.75)	0	0	34	52.3	26	40	X <sup>2</sup> =82.400, p=0.000**
Mean (SD)	0		3.470(1.973)		3.730(1.662)		
Grey zone (somewhat controlled asthma) (0.75- 1.5)	33	50.8	25	35.5	22	33.8	
Mean (SD)	7.78 (1.596)		7.96 (1.019)		7.50(0.859)		
Poorly controlled asthma (> 1.5)	32	49.2	6	9.2	17	26.2	
Mean (SD)	14.25(2.214)		11.00(1.648)		12.29(0.985)		

X<sup>2</sup> refers to chi square test, X<sup>-2</sup> refers to Friedman test, \* refers to significance if p less than 0.05, \*\* refers to highly significance if p less than 0.001.

**Table 5** reflected that all the patients in the pretest did not control their asthma. After the application of exercise, more than half of the study subjects had well-controlled asthma in post-test I, and nearly half of them had moderately

controlled asthma in post-test II. The results also revealed that there was a highly statistically significant difference regarding asthma control level between pre-test, Post-test 1, and Post-test II.

**Table 6:** Relation Between Asthma Control (ACQ) and age group, gender, marital status, and occupation of the Study Sample (N=65)

Items	Pretest		Post 1			Post 2		
	Some what Controlled	Poorly controlled	Well controlled	Some what Controlled	Poorly controlled	Well controlled	Some what Controlled	Poorly controlled
	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)
<b>Age group (Years)</b>								
20:30	7 (10.8)	0 (0)	7 (10.8)	0 (0)	0 (0)	7 (10.8)	0 (0)	0 (0)
31:50	14 (21.5)	14 (21.5)	21 (32.3)	7 (10.8)	0 (0)	13 (20)	15 (23.1)	0 (0)
51:65	12 (18.5)	18 (27.7)	6 (9.2)	18 (27.7)	6 (9.2)	6 (9.2)	7 (10.8)	17 (26.2)
Significance	X <sup>2</sup> =8.187, p=0.017*		X <sup>2</sup> =26.417, p=0.000**			X <sup>2</sup> =35.990, p=0.000**		
<b>Gender</b>								
Male	33 (50.8)	14 (21.5)	34 (52.3)	13 (20)	0 (0)	26 (40)	21 (32.3)	0 (0)
Female	0 (0)	18 (27.7)	0 (0)	12 (18.5)	6 (9.2)	0 (0)	1 (1.5)	17 (26.2)
Significance	X <sup>2</sup> =25.672, p=0.000**		X <sup>2</sup> =33.837, p=0.000**			X <sup>2</sup> =60.233, p=0.000**		
<b>Marital status</b>								
Married	26 (40)	32 (49.2)	27 (41.5)	25 (38.5)	6 (9.2)	19 (29.2)	22 (33.8)	17 (26.2)
Not married	7 (10.8)	0 (0)	7 (10.8)	0 (0)	0 (0)	7 (10.8)	0 (0)	0 (0)
Significance	X <sup>2</sup> =7.607, p=0.006*		X <sup>2</sup> =7.153, p=0.028*			X <sup>2</sup> = 11.767, p=0.003*		
<b>Occupation</b>								
Hand craft	14 (21.5)	14 (21.5)	21 (32.3)	7 (10.8)	0 (0)	20 (30.8)	8 (12.3)	0 (0)
Farmer	19 (29.2)	0 (0)	13 (20)	6 (9.2)	0 (0)	6 (9.2)	13 (20)	0 (0)
Housewife	0 (0)	18 (27.7)	0 (0)	12 (18.5)	6 (9.2)	0 (0)	1 (1.5)	17 (26.2)
Significance	X <sup>2</sup> =36.993, p=0.000**		X <sup>2</sup> =34.058, p=0.000**			X <sup>2</sup> =70.037, p=0.000**		

X<sup>2</sup> refers to chi square test, \* refers to significance if p less than 0.05 & \*\* refers to highly significance if p less than 0.001.

Table 6 revealed that there was a statistically significant relation between asthma control and age, gender, marital

status, and occupation of the study subjects on Pretest, Post-test 1, and Post-test 2.

**Table 7:** Relation Between Asthma Control (ACQ) and educational level, residence, and income of the study sample (N=65)

Items	Pretest		Post 1			Post 2		
	Some what Controlled	Poorly controlled	Well controlled	Some what Controlled	Poorly controlled	Well controlled	Some what Controlled	Poorly controlled
	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)
<b>Educational level</b>								
Illiterate	0(0)	6(9.2)	0(0)	6(9.2)	0(0)	0(0)	1(1.5)	5(7.7)
Read& write.	0(0)	12(18.5)	0(0)	6(9.2)	6(9.2)	0(0)	0(0)	12(18.5)
Secondary	19(29.2)	7(10.8)	13(20)	13(20)	0(0)	6(9.2)	20(30.8)	0(0)
Higher education	14(21.5)	7(10.8)	21(32.3)	0(0)	0(0)	20(30.8)	1(1.5)	0(0)
Significance	X <sup>2</sup> =25.863, p=0.000**		X <sup>2</sup> =60.374, p=0.000**			X <sup>2</sup> =93.982, p=0.000**		
<b>Residence</b>								
Rural	27 (41.5)	12(18.5)	27(41.5)	6(9.2)	6(9.2)	20(30.8)	8(12.3)	11(16.9)
Urban	6(9.2)	20(30.8)	7(10.8)	19(29.2)	0(0)	6(9.2)	14(21.5)	6(9.2)
Significance	X <sup>2</sup> =13.295, p=0.000**		X <sup>2</sup> =22.838, p=0.000**			X <sup>2</sup> =8.381, p=0.015*		
<b>Income</b>								
Low	6(9.2)	18(27.7)	6(9.2)	12(18.5)	6(9.2)	6(9.2)	1(1.5)	17(26.2)
Moderate	27(41.5)	14(21.5)	28(43.1)	13(20)	0(0)	20(30.8)	21(32.3)	0(0)
Significance	X <sup>2</sup> =10.109, p=0.002*		X <sup>2</sup> =16.991, p=0.000**			X <sup>2</sup> =41.08, p=0.000**		

X<sup>2</sup> refers to chi square test, \* refers to significance if p less than 0.05 & \*\* refers to highly significance if p less than 0.001.

Table 7 revealed that there was a statistically significant relation between asthma control and educational level, residence, and income of the study subjects on Pretest, Post-test 1, and Post-test 2.

**Table 8:** Relation between asthma control (ACQ) and duration of disease, smoking history, body mass index, and disease severity of the study sample (N=65)

Items	Pretest		Post 1			Post 2		
	Somewhat controlled	Poorly controlled	Well controlled	Somewhat controlled	Poorly controlled	Well controlled	Somewhat controlled	Poorly controlled
	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)
<b>Duration of disease (Years)</b>								
< 5	7 (10.8)	0 (0)	7 (10.8)	0 (0)	0 (0)	7 (10.8)	0 (0)	0 (0)
6:10	7 (10.8)	14 (21.5)	14 (21.5)	7 (10.8)	0 (0)	13 (20)	8 (12.3)	0 (0)
+10	19 (29.2)	18 (27.7)	13 (20)	18 (27.7)	6 (9.2)	6 (9.2)	14 (21.5)	17 (26.2)
Significance	X <sup>2</sup> =9.347, p=0.009*		X <sup>2</sup> =14.332, p=0.006*			X <sup>2</sup> =29.572, p=0.000**		
<b>Smoking history</b>								
Active	13 (20)	0 (0)	7 (10.8)	6 (9.2)	0 (0)	7 (10.8)	6 (9.2)	0 (0)
Passive	20 (30.8)	14 (21.5)	27 (41.5)	7 (10.8)	0 (0)	19 (29.2)	15 (23.1)	0 (0)
Non-smoker	0 (0)	18 (27.7)	0 (0)	12 (18.5)	6 (9.2)	0 (0)	1 (1.5)	17 (26.2)
Significance	X <sup>2</sup> =32.051, p=0.000**		X <sup>2</sup> =36.610, p=0.000**			X <sup>2</sup> =60.254, p=0.000**		
<b>Years of smoking (N=47)</b>								
5-10	14 (29.8)	0 (0)	14 (29.8)	0 (0)	0 (0)	14 (29.8)	0 (0)	0 (0)
11-20	13 (27.7)	7 (14.9)	20 (42.6)	0 (0)	0 (0)	12 (25.5)	8 (17)	0 (0)
+20	6 (12.8)	7 (14.9)	0 (0)	13 (27.7)	0 (0)	0 (0)	13 (27.7)	0 (0)
Significance	X <sup>2</sup> =9.979, p=0.007*		X <sup>2</sup> = 47.134, p=0.000**			X <sup>2</sup> =27.580, p=0.000**		
<b>Body mass index</b>								
Under weight	7 (10.8)	0 (0)	7 (10.8)	0 (0)	0 (0)	7 (10.8)	0 (0)	0 (0)
Normal	7 (10.8)	7 (10.8)	14 (21.5)	0 (0)	0 (0)	13 (20)	1 (1.5)	0 (0)
Overweight	19 (29.2)	13 (20)	13 (20)	19 (29.2)	0 (0)	6 (9.2)	21 (32.3)	5 (7.7)
Obese	0(0)	12(18.5)	0 (0)	6 (9.2)	6 (9.2)	0 (0)	0 (0)	12 (18.5)
Significance	X <sup>2</sup> =20.114, p=0.000**		X <sup>2</sup> =54.875, p=0.000**			X <sup>2</sup> =75.289, p=0.000**		
<b>Disease severity</b>								
Mild	26 (40)	0 (0)	20 (30.8)	6 (9.2)	0 (0)	13 (20)	13 (20)	0 (0)
Moderate	7 (10.8)	32 (49.2)	14 (21.5)	19 (29.2)	6 (9.2)	13 (20)	9 (13.8)	17 (26.2)
Significance	X <sup>2</sup> = 42.020, p=0.000**		X <sup>2</sup> = 11.686, p=0.003*			X <sup>2</sup> =15.758, p=0.000**		

Table 8 revealed that there was a statistically significant relation between asthma control and duration of disease, smoking history, body mass index, and disease severity of the study subjects on Pretest, Post-test 1, and Post-test 2.

**Discussion**

Because asthma is a chronic disease, asthmatic patients have

to learn to adapt to its long-term condition throughout their lives. Maintaining a steady medication regimen, an ample supply of inhalers, avoiding asthma triggers whenever possible, and learning to live with the unpredictable nature of the disease and its effects on daily life can all be challenges for those living with asthma and their families. Most importantly, asthmatic individuals need to be able to

identify when their asthma is getting worse and being able to decide when to modify their drugs, correct time for using emergency medications, and when to consult a specialist to maintain and improve their asthma control<sup>(17)</sup>. Therefore, the aim of our study is to evaluate the effect of self-care management on controlling patients with asthmatic disease.

#### **Concerning levels of asthma control of the study sample**

Regarding asthma control levels, it was clear that half of the study subjects have poorly controlled asthma before the application of self-management program. These results were similar to Abbas & Amen<sup>[26]</sup> & Zeru *et al.* (2020)<sup>[27]</sup> and Ghozali & Urrohmah (2023)<sup>(17)</sup> who reported that half of the study subjects have poorly controlled asthma before the application of self-management program. As well these results were nearly close to Sadek *et al.*, (2022)<sup>[28]</sup> and Nguyen & Huynh and Chavannes (2018)<sup>[29]</sup> who reported that less than half of the study subjects have poorly controlled asthma.

According to the researcher's point of view, the reason for these results is that most of the study subjects are from rural areas, lower educational level and socioeconomic status, poor adherence to treatment plan because of the high prices of asthma medications (Inhalers), majority of patient didn't receive any health education program about their disease, and the lack of interest from health institutions in providing health education programs for patients with bronchial asthma.

These assumptions were supported by Khraba *et al.*, (2022)<sup>[30]</sup> who reported that patients of lower socioeconomic status often report poor health behaviors that may exacerbate asthma, including higher rates of current smoking, reduced consumption of fruits and vegetables, and obesity. Also, patients with lower educational level have lower socioeconomic status and may have higher exposures to indoor and outdoor allergens, and tend to be less compliant with medication, thus increasing risk for acute asthma exacerbations which impair their asthma control and quality of life.

Concerning comparison between asthma control levels before self-care management program (Pre-Test) and after self-care management program by 1 month (Post Test), Our study results reflected that nearly half of subjects had poor controlled asthma on pretest. After application of self-care management program by one month, more than half of study subjects had well controlled asthma. These results were in accordance with El Sayed & Ismail (2018)<sup>[31]</sup> who reported that more than half of subjects had poor controlled asthma on pretest. After application of self-care management program by one month, more than half of study subjects had well controlled asthma.

Also, Eissa *et al.*, (2020)<sup>[22]</sup> reported that less than half of subjects had poorly controlled asthma on pretest. After application of self-care management program, more than half of study subjects had well controlled asthma. Furthermore, our results were in agreement with Abd El Fatah *et al.*, (2020)<sup>[29]</sup> who reported that more than half of subjects had poor controlled asthma. After application of educational interventions, nearly half of study subjects had well controlled asthma.

Regarding asthma control levels after application of self-care management program by 3 months (Follow up), results revealed that less than half of subjects had well controlled asthma and more than third of subjects had moderately

controlled asthma. These results were near similar to El Abed *et al.*, (2023)<sup>[30]</sup> who reported that more than half of subjects had well controlled asthma and more than third of subjects had moderately controlled asthma on follow up after 3 months. Also, Al Masry *et al.*, (2021)<sup>[31]</sup> reported that more than half of subjects had moderately controlled asthma on follow up after 3 months.

Based on the results of the current study, it has been noticed that there was a highly statistically significant difference regarding asthma control level before and after (1 month & 3 months) from self-care management program. These results are in agreement with Naeem *et al.* (2021)<sup>[32]</sup> & Eck *et al.*, (2022)<sup>[33]</sup> who reported that there was a statistically significant difference regarding asthma control level before and after application of self-management program.

#### **Concerning relation between asthma control and socio-demographic characteristics of the study sample**

Concerning relation between asthma control and socio-demographic characteristics of the study sample, results of the current study reflected that there was a statistically significant relation regarding asthma control of study subjects according to their gender, educational level, occupation, and duration of disease. These findings were on the same line with Belachew *et al.*, (2022)<sup>[34]</sup> who reported that there was a statistically significant relation between asthma control and gender, educational level, occupation, and duration of disease of the study subjects.

On the other hand, Ahmed *et al.*, (2020)<sup>[35]</sup> reported that there was no significant relation regarding asthma control of study subjects according to their gender, occupation, income, and duration of disease. Another study conducted by Zeru *et al.* (2020)<sup>[29]</sup> explained that there was weak relation between asthma control and gender. However, they mentioned that there was no significant relation between asthma control and educational level, occupation, and duration of disease of the study subjects.

Based on findings of our study, a statistically significant relation between asthma control and smoking history and body mass index. These results agreed with Upham *et al.*, (2021)<sup>[35]</sup> who reported that there was a significant relation between asthma control and smoking history and body mass index of study subjects.

#### **Conclusion**

The current study illustrated that all the patients did not completely control their asthma before application of self-care management education. After one month from the application of self-care management education, more than half of the study subjects had well-controlled asthma, and half of the study subjects had moderately controlled asthma on follow up after 3 months.

#### **Recommendations: Based on the findings of the current study recommendations are suggested as follows**

- Results should be generalized to a larger sample size and different geographic regions through the continuation of the self-management program for asthmatic patients, which focuses on management behaviors, particularly the prevention of asthmatic triggers and the management of asthma attacks.
- Improve asthma care and control by disseminating a comprehensive and simplified booklet for nurses supported with essential information and illustrated

photos about management of asthma.

- Nurses at chest outpatient clinics should get periodic refresher courses and training on pulmonary disorders, particularly asthma, to actively participate in teaching asthmatic patients how to control and manage their disease.

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