

Effect of training program Regarding Knowledge and Self Care practices on patients with bronchial asthma

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Abstract

Background: Self-care is described as the healthcare and social-care services provided to individuals to enable them to take better care of themselves. In Asthma, patient self-management programs incorporating multicomponent interventions such as self-management education, exercise training and psychosocial support can improve health outcomes and reduce healthcare costs. **Aim:** Evaluate the effect of training program regarding self-care practices and knowledge of bronchial asthma patients. **Subjects and method: Design:** A purposive sample of 70 adult patients diagnosed with Asthma included in this study. Quasi experimental research design was used to conduct this study. **Setting:** Study was conducted in inpatient departments at Zigzag Chest Hospital and Chest Department affiliated to Zigzag University Hospital. The two settings affiliated to Sharkia Governorate, Egypt. **Tools:** Three tools used to conduct the study questionnaire about socio demographic characteristics, a standardized structured asthma knowledge questionnaire, regarding inhaled medications, a performance check-list adapted for each inhaler device, Nebulizer & breathing retraining Diaphragmatic Breathing and Cough Exercise. **Results:** The results revealed that there was a statistically significant difference between patients' knowledge of asthma self-management, accuracy of inhaler use technique and asthma control before and after the training program where $P < 0.0001$. There was a significant statistical improvement in patients' knowledge about asthma. It increased from 4.3% before the training program to 77.1% after the training program, and showed that there was statistical improvement asthma regarding the practice of the inhaler medication from 17.1% to 80% after the training program, showed that there was a statistically significant level of patients' knowledge about asthma regarding the practice of inhalation technique, it increased from 12.9% before the training program to 44.3% after the training program ($p < 0.05$). **Conclusion:** Based upon the results of this study, it could be concluded that implementation of training program had a positive effect on improvement of the patients' knowledge, self care practices. post program implementation compared to pre-program implementation. **Recommendations:** Promotion and enhancement of the self-care management to the patient through showing a picture about triggers, allowed foods, and follow up should be continued after termination of the treatment through the rehabilitation program.

Keywords: Bronchial asthma, Self-care practices, Training program.

Introduction

Asthma is the most common chronic disease among children and also affects millions of adults. About 235 million people worldwide suffer from this non communicable disease The burden of asthma has been growing over the past 30 years, particularly in the low and middle income countries least able to absorb its impact (Hosny, et al 2022).

The World Health Organization (WHO) estimates that this condition results in the loss of 15 million disability adjusted life years (DALYs) each year. Untreated or improperly treated, it may have a detrimental effect on carer productivity, resulting in a cycle of poverty in families and communities, More

than 339 million people worldwide suffer with asthma, with a frequency of 12.6%. (Vos, et al. 2017). In 2019, More than 461,000 people have died from asthma-related causes, especially in low- and middle-income countries (LMIC), where early diagnosis and adequate treatment remains difficult to obtain (WHO. 2020). The prevalence in Egypt is approximately 6.7% of the total population (Tarraf, et al. 2018).

Given the consequences of smoking on adult patients and the overlap with chronic bronchitis, the definition of asthma as bronchial hyper responsiveness with symptomatic wheezing proved ineffective (Hosny, et al 2022). According to today's definition, asthma is a long-term inflammatory disorder of the airways that affects both adults and children

and causes dyspnea, wheezing on expiration, and chest tightness (GINA. 2021).

It is important to note that COVID-19 is characterised by several symptoms that are typical of asthma exacerbations, such as dry cough and increasing dyspnea, which adds to the challenge of making a diagnosis (Beaney, et al. 2020). Less than 25% of asthma patients in the Middle East and North Africa (MENA), including Egypt, adhere well to their treatment, making it difficult to control their asthma (Bassam, et al. 2021) and less than one-third of asthma patients have a managed condition (Tarraf, et al. 2018).

In theory, exacerbation chances have decreased with the development of stepwise therapy with reliever and controller drugs. However, asthmatic attacks continue, and the best asthma management is still difficult, particularly in primary care settings. (Fischer, et al. 2016). In 2020, the Global Initiative for Asthma (GINA) identified that no evidence supported the long-term use of short-acting beta-agonist (SABA) alone, and SABA is no longer recommended as monotherapy for asthmatic patients (GINA. 2021).

Likewise, the under-use of inhaled corticosteroids (ICS) increased the risk of exacerbations and related mortality (Hosny, et al. 2022). In contrast, single-inhaler combinations of long-acting beta-agonists (LABA) with ICS taken as needed to potentially overcome conventional approaches' limitations, with considerable evidence over the past decade and from the recent SYGMA trials (O'Byrne, et al.2017)(Bateman, et al.2018).

Self-control of asthma and written action plan have become progressively important in asthma management, as the philosophy of treatment moved towards patients' involvement in treating his/her own disease and asthma education has been implemented at different points of care with variable outcomes. Self-management interventions help patients with asthma develop and practice the skills they need to achieve disease-specific medical regimes, direct changes in health behavior and offer emotional support to empower patients to control their disease (Ali & Abou Elmaati. 2016).

Significance of the study:

Nurses are important member of the healthcare team, often the first point of call and sometimes the closest contact of people with asthma, and they play a vital role in educating the patients. Nurses as health care provider are closer in contact with the patients, at most times they are first and last contact and they are expected to educate and train the patients when inhaler devices are prescribed to these patients. (Ali & Abou Elmaati. 2016). So this training program done to help these patients with asthma to overcome their disease and cope with it.

The aim of this study is to

Evaluate the effect of training program regarding knowledge and self-care practices on patients with bronchial asthma

Research hypothesis

1-Patient's asthma knowledge will improve post program implementation

2-Self-care practices (inhaler technique and Nebulizer & breathing retraining Diaphragmatic Breathing and Cough Exercise will be improved after implementation of training program among patients with asthma when compared with pre implementation levels.

Study design

One group, pre/posttest, quasi experimental research design was used to conduct this study. This type of intervention studies tests causal hypotheses. In quasi-experimental design, the program or policy is viewed as an 'intervention' in which a treatment – comprising the elements of the program /policy being evaluated – is tested for how well it achieves its objectives (White and Sabarwal. 2019) In the present study, a pre-test/post-test strategy was used with two periods of data collection. Data were collected before intervention (pre-test) and month following the intervention (post-test).

Setting

Study was conducted in inpatient departments at Zigzag Chest Hospital and Chest Department affiliated to Zigzag University Hospital, three days per week, the

department consist of two wards one for male and another for female and there was isolating room for infected diseases . The two settings affiliated to Sharkia Governorate, Egypt.

Subjects:

A purposive sample of 70 adult patients diagnosed with Asthma. Inclusion criteria include patient older than 20 years old, diagnosed at least since three months ago, receiving inhaler medications, able and willing to participate in the study.

Sample size calculation:

The sample size was estimated based on the bronchial asthma prevalence among Egyptian adults that was 6.7% (Alavinezhad & Boskabady. (2018). Considering the confidence interval 95% and the power of the study 80%, the calculated sample was 65 patients. It was increased to 70 patients to avoid dropout of the participants. The total number of attendees during the period of study (above 20 years old) was 360. The number of populations, which were asthmatic and met the requirements for inclusion, was 77 subjects, Except 10% percent for the pilot study, and the study was performed on 70 patients after the drop-out of cases through the study.

Tools: Three tools used for data collection in this study

Tool I: Patient's Assessment Sheet consisted of two parts:

Part (1): concerned with data related to demographic characteristics of the study sample such as age, gender, education level, marital status, residence, occupation.

Part (2): concerned with medical data of study sample such as previous/current history of smoking, duration of disease, type of used inhaler devices, duration of use in months, previous inhaler training, and self reported adherence to prescribed medication.....etc.

ToolII: standardized structured asthma knowledge questionnaire consisted of two parts

Part (1): was adopted from Ali & Abou Elmaati. (2016)and used to assess patient's knowledge regarding asthma. It is a self-reported instrument and consisted of 26

close-ended questions, presenting yes, no or I don't know options. 1 score assigned for each correct answer and 0 for incorrect or I don't know answer, the total score ranged from 0 to 26

Part (2): Knowledge regarding inhaled medications is concerned with collection of data regarding inhaled medication among asthma patients and consists of seven items, the first six items answered by yes or no while the last seventh one (How many times has your physician observed you using your inhaled medication?) answered by never, once, or twice / more times.

Scoring system

According to Desalu et al., (2012) the knowledge score was determined as the total number of correct answers. If score was more than 70%, it was regarded as good, if score was 50-70% it was regarded as satisfactory and if score was less than 50% it was regarded as poor for asthma knowledge.

Tool III: it was observational checklist to evaluate patient performance pre and post program

It concerned with assessment of patient inhaler technique; participant inhaler technique has been evaluated in a practical manner, by asking patients to demonstrate their inhaler technique with a placebo device using prepared checklists derived from Global Initiative for Asthma (2022) and the Australian Respiratory Guidelines, (2021), a checklist adapted for each inhaler device, Nebulizer & breathing retraining Diaphragmatic Breathing and Cough Exercise. One point was allotted for each correct step done, resulting in a maximum score of eight. Three steps for each device were designated essential by the researchers (because it could considerably affect dose supply to the lung). It was considered that even if the overall score was high, if one of these steps was incorrect, then inhaler technique would be poor. Good technique was defined as achieving a minimum score of five; with the three essential steps correct.

Scoring system:- according to Nguyen, Huynh& Chavannes, (2018) divided into three categories named Good practice more

than 75%, Adequate practice between 50%-75% and Poor practice less than 50%.

Methods of data collection:

The program principles were to encourage asthmatic patient to achieve the desired practices toward their disease effectively. This study was conducted in two phases; first phase was a pre-test evaluation of asthmatic patient using a predesigned questionnaire followed by implementation of an educational program and the post-test evaluation

Preparatory phase:

This phase began with reviewing past and current literatures of national and international resources concerning the topic of the study. This was done using textbooks, articles, periodicals, magazines, research, and internet search. The purpose was to gain in-depth knowledge of all aspects related to the study, and to develop data collection tools as well.

Content validity:

During this phase, the researcher prepared the data collection tools in their preliminary form. They were then presented to a panel of three experts for face and content validation. These included two lecturers in Medical Surgical Nursing, and one professor from Faculty of Medicine, Zagazig University, who revised the tools for clarity, relevance, comprehensiveness, understanding, and ease for implementation and according to their opinion minor modification were applied.

Reliability:

The reliability test was done for the tools of data collection by using Cronbach's Alpha test was 0.7, 0.82 for patients' knowledge score, Patients' practice score respectively. This showed that the reliability coefficients are in the high values.

Pilot study:

A pilot study for tools of data collection was carried out in order to test whether they are clear, understandable, feasible applicability and time consuming to fill the tool. For this study, the researcher randomly selected seven patients to participate in the pilot testing of the questionnaire representing 10% percent from

the total sample size. Those patients were included in the study because of no modifications in the tools.

Ethical consideration:

The study was approved by the Faculty of nursing Research Ethics Committee, Zagazig University and the included participants signed a written informed consent. All research ethics principles were followed. Participation in this study was voluntary. In addition, an informed consent was obtained from each participant prior to inclusion into the study and after full explanation of its aim and procedures. The researcher explained the benefits and risks of participation in the study for each group. They were informed about their rights to refuse or withdraw from the study at any time with no reason to be given or consequences. They were reassured about confidentiality and their privacy was maintained in all study and program activities.

Field work:

Target population was asthmatic patient having mild to moderate bronchial asthma, over 20 years old, without significant comorbidity. The asthmatic patients who attended the Chest Hospital Clinic from 10:00 am till 2:00 pm daily for 3 days per week during the period from the 1st of May 2022 till the end of August 2022 and fulfilled the inclusion criteria for participation in the study. The total number of attendees during the period of study (above 20 years old) was 360. The number of populations, which were asthmatic and met the requirements for inclusion, was 77 subjects, Except 10 subjects for the pilot study, and the study was performed on 70 patients.

Program description:

The training Program will be designed by the researcher after revising of related literature to asthmatic patient regarding self-care practices management. This study will be conducted on four consecutive phases (Assessment, Planning, followed by implementation and evaluation).

Assessment: The researcher visited the study setting, met with the directors and head nurses to explain the study aim and procedures, and to gain their approval and cooperation. Then, the researcher met with the patients who

fulfilled the inclusion criteria, explained to them the purpose of the study and its procedures as well as their rights, and invited them to participate.

The researcher visited the Chest Hospital Clinic from 10:00 am till 2:00 pm daily for 3 days per week during the period from the 1st of May 2022 till the end of August 2022. The patient filled the written questionnaire in the presence of the researcher or it was filled by the researcher for illiterate patient, the time needed for completing the patient's assessment tool, **standardized structured asthma knowledge questionnaire**, Self-practices **observational checklist** (use of metered dose inhaler, use in Accuhaler Inhaler Technique use in aerolizer/ hand haler Technique, use in Nebulizer Technique and Breathing retraining (Diaphragmatic Breathing and Cough Exercise Technique(pre test) was about 45 minutes for each patient. Diaphragmatic Breathing and Cough Exercise Technique.

Planning: During this phase, the researcher designed the program based on review of the most recent and relevant literature, and under the guidance of the supervisors and according patients' needs to provide proper care for their inhaler and perform the best practices the researcher will be designed self-management program to improve patients' knowledge, self-practices.

Implementation: The content of the program was developed based on this general aim in addition to specific objectives, which responded to patients' needs identified in the assessment phase. It consisted of two main parts. The first part was theoretical, providing detailed knowledge of self-management support program, bronchial asthma, triggers, inhaled medication The second part was mainly practical. It involved use in metered dose inhaler, use in Accuhaler Inhaler Technique use in aerolizer/ hand haler Technique, use in Nebulizer Technique and Breathing retraining

Traning program consisted of two parts, theoretical part and practical part, the content of the program was distributed over 13 consecutive sessions. The first session was for orientation to clarify aim and contents of the program, its general objectives, the teaching methods, learner's activities, and evaluation

methods. The researchers used simple language to suit the level of patients, with motivation and reinforcement to enhance learning. Four sessions covered the theoretical part of the program, this phase giving individual knowledge about asthma, triggers, education sessions, assisting the patients in making decisions about the maintenance, modification, or improvement of their current attack and assisting each patient to set a goal and an action plan according to the decisions made. *Theoretical part* will be implemented through educational sessions. It will include 5 sessions about self-management support program, bronchial asthma, medication, inhalation practice.

Practical part implemented through interviewing each patient individually. It was given in 8 sessions; It involved use in metered dose inhaler, use in Accuhaler Inhaler Technique use in aerolizer/ hand haler Technique, use in Nebulizer Technique and Breathing retraining and cough exercise. Time of each session within 30 - 45 minutes. The study group was a booklet outlining suitable asthma care guidelines (knowledge about bronchial asthma, life style modifications and healthy diet, medication, inhaler device) in the first week of the program. The subjects also encouraged to set weekly action plans and the goals they sight to attain during their participation in this study. During the practical sessions, each patient was assessed whether he/she follows the prescribed guidelines or not.

Evaluation: After implementation, the subjects were contacted weekly by a phone-call follow-up in order to assess their progress in improving their prognosis and to briefly counsel them in respect of any actions that they found difficult to complete. After month, the subjects in the study group were given a brief counseling on the day of their regular hospital check-up at the chest unit, to follow up their progress and the improvement in their practices was assessed using the (post-test) questionnaire for the study group.

Statistical Analysis

All data were collected, tabulated and statistically analyzed using IBM Corp. Released 2015. IBM SPSS Statistics for Windows, Version 23.0. Armonk, NY: IBM

Corp.. Quantitative data were expressed as the mean \pm SD & median (range), and qualitative data were expressed as number & (percentage). Wilcoxon sign rank test was used to compare between paired of non-normally distributed variables. Percent of categorical variables were compared using, Chi square test, McNemar test was used to compare between paired categorical variables. Marginal Homogeneity Test was used to compare between paired ordinal data. Pearson' correlation coefficient was calculated to assess relationship between various study variables, (+) sign indicate direct correlation & (-) sign indicate inverse correlation, also values near to 1 indicate strong correlation & values near 0 indicate weak correlation. .All tests were two sided. p-value < 0.05 was considered statistically significant, p-value \geq 0.05 was considered statistically insignificant.

Results

In table (1): It was found that 61.4% of patients with asthma were males and 38.6% were females. It was also found that 44.3% of asthma patients were in the age group between 41-50 years. Regarding patients education 44.3% of the studied patients had read and write while 40.0% had illiterates. In addition to 61.4% of the study, patients had manual work and 38.6% had wives at home. With regard to marital status, 100.0% of married. With regard to residence 77.1% of the rural study. Regarding smoking, 62.9% are non-smokers.

In table (2): It was found that regarding activity level, 54.3% are mild activity. Regarding family history of asthma, 51.4% are no family history of asthma. It was also found that 77.1% of patients with asthma suffer from asthma attacks in the winter. It was also found that 35.7% of patients with asthma suffer from asthma attacks in the spring. It was also found that 100.0% of patients with asthma notice taking inhaled medications (twice or more).

Table (3): It was represented in the fact that there was a significant statistical improvement in patients' knowledge of asthma. It increased from 4.3% before the training program to 77.1% after the training program, and showed that there was a high level of patients' knowledge of asthma regarding the behavior of

the inhaler medication from 17.1% to 80% after the training program. , showed that there was a statistically significant level of patients' knowledge about asthma regarding the practice of inhalation technique, it increased from 12.9% before the training program to 44.3% after the training program ($p < 0.05$).

Table (4): Illustrates that comparison between knowledge of asthmatic patients, Inhaled medication behavior, their practice about inhaler treatment pre and post intervention program as it shows there was highly statistical significant = $P < 0.0001$

Table (5): this table shows that (32.6) % of Males of studied group had satisfactory knowledge level pre intervention and (48.4) % had of studied group had satisfactory knowledge level pre intervention were read and write educated. Majority of urban patients (56.3) % had satisfactory knowledge level pre intervention. Moderate activity patients (53.1)% had satisfactory family history of asthma in pre study phase while (41.2)% had satisfactory family history of asthma in pre study phase.

Table (6): this table shows that (74.1)% of females had poor behavior about medication in pre study phase and also house wives(74.1)% had poor behavior about medication in pre study phase. There was statistical significant difference between rural and urban patients where more than half rural patients(57.4) % had poor behavior about medication in pre study phase. There was statistical significant difference between mild activity and moderate activity patients where more than one third mild activity patients(39.5) % had satisfactory behavior about medication in pre study phase while (9.4)% had satisfactory behavior about medication in pre study phase

Table (7): this table shows that (92.6)% of females of studied group had satisfactory practice level pre intervention and (72.7)% had of studied group had satisfactory practice level pre intervention were educated. Majority of rural patients(90.7)% had satisfactory practice level pre intervention. mild activity patients(39.5) % had satisfactory behavior about medication in pre study phase while (9.4)% had satisfactory behavior about medication in pre study phase

Table (8): This table shows that (3.7)% of females had poor knowledge level in the post

intervention program. About (74.2)% of patients who read and write had good knowledge level in the post intervention program. Around (84.1) of nonsmoker patients had good knowledge level in the post intervention program .About (8.3) % of patients who had no family history of asthma had satisfactory knowledge level in the post intervention program.

Table (9): this table shows that (81.5) % of females had good behavior about medication in post intervention program, and also house wives (81.5)% had good behavior about medication in post intervention program. About (85.7)% of illiterate patients had good behavior about medication in post intervention program and no urban patients had poor behavior about medication in post intervention program.

Table (10): this table shows that (60.5)% of males of studied group had good practice level post intervention program and (64.3)% had of

studied group had good practice level post intervention program were illiterate. More than one third of rural patients (46.3)% had satisfactory practice level post intervention program. Mild activity patients (44.7)% had satisfactory behavior about medication in poststudy phase .

Table (11): this table illustrated that there is coefficient correlation between patients' knowledge score and Patients ' behavior score in the pre intervention program and there is also coefficient correlation between patients' practice e score and Patients ' behavior score in the pre intervention program where p is 0.0001. Also there is coefficient correlation between patients' knowledge score and Patients ' behavior score in the post intervention program and there is also coefficient correlation between patients' practice e score and Patients ' behavior score in the post intervention program where p is 0.0001.

Table 1: Demographic characteristics of studied asthmatic patients (n=70):

Variables	n.	%
gender		
Males	43	61.4
Females	27	38.6
AGE		
31-40 years	20	28.6
41-50 years	31	44.3
51-60 years	19	27.1
Education		
illiterates	28	40.0
read and write	31	44.3
Educated	11	15.7
Occupation		
Manual work	43	61.4
House wives	27	38.6
Marital status		
Married	70	100.0
Residence		
Rural	54	77.1
Urban	16	22.9
Smoking		
non smoker	44	62.9
smoker	26	37.1

Table 2: Profile of asthma in studied patients,(n=70):

Variables	n.	%
Family history of asthma		
No	36	51.4
Yes	34	48.6
Time of asthma attack winter	54	77.1
Time of asthma attack spring	25	35.7
Doctors observe using inhaled medication (twice or more)	70	100.0
Activity level		
mild activity	38	54.3
moderate activity	32	45.7

Table 3: Comparison between knowledge of asthmatic patients, Inhaled medication behavior, their practice about inhaler treatment pre and post intervention program.

		Studied phases				p
		pre		post		
		n.	%	n.	%	
Patients' Knowledge about asthma	Good	3	4.3	54	77.1	0.0001
	Satisfactory	17	24.3	6	8.6	
	Poor	50	71.4	10	14.3	
Inhaled medication behavior	Good	12	17.1	56	80.0	0.0001
	Satisfactory	18	25.7	12	17.1	
	Poor	40	57.1	2	2.9	
Metered dose inhaler	Good	6	8.6	55	78.6	0.0001
	Poor	64	91.4	15	21.4	
Accuher inhaler technique	Good	0	.0	52	74.3	0.0001
	Poor	70	100.0	18	25.7	
Aerolizer Hand inhaler technique	Good	0	.0	51	72.9	0.0001
	Poor	70	100.0	19	27.1	
Neubalizer technique	Good	0	.0	38	54.3	0.0001
	Satisfactory	0	.0	20	28.6	
	Poor	70	100.0	12	17.1	
Diaphragmatic inhaler technique	Good	0	.0	39	55.7	0.0001
	Satisfactory	7	10.0	25	35.7	
	Poor	63	90.0	6	8.6	
Cough exercise technique	Good	2	3	44	62.8	0.0001
	Satisfactory	17	24.3	6	8.6	
	Poor	51	72.7	20	28.6	
Practice of inhaler technique	Good	0	.0	39	55.7	0.0001
	Satisfactory	9	12.9	31	44.3	
	Poor	61	87.1	0	0.0	

(*) maximum score, Mc nemar. Marginal homogeneity test, p<0.05 statistically significant

Table 4: Comparison between average knowledge of asthmatic patients, Inhaled medication behavior, their practice about inhaler treatment pre and post intervention program.

Variables		Study phase		% of improvement	p
		pre	post		
Patients' Knowledge about asthma	Mean± SD	9.6±5.05	21.3±5.5	122.17	0.0001
	Median(range)	9(2-22)	24(10-26)		
Inhaled medication behavior	Mean± SD	2.8±1.4	5.3±1.2	91.3	0.0001
	Median(range)	2(1-6)	6(20-6)		
Metered dose inhaler	Mean± SD	3.3±1.5	5.64± 1.8	69.5	0.0001
	Median(range)	3(1-7)	5.5(2-8)		
Accuher inhaler technique	Mean± SD	2.6±0.77	6.7±1.8	163.69	0.0001
	Median(range)	2(1-4)	8(3-8)		
Aerolizer Hand inhaler technique	Mean± SD	3.7±1.7	9.8±2.7	164.86	0.0001
	Median(range)	4(1-7)	11.5(4-12)		
Neubalizer technique	Mean± SD	4.5±1.9	12.6±3.1	180.64	0.0001
	Median(range)	4(1-8)	6(2-7)		
Diaphragmatic inhaler technique	Mean± SD	2.1±0.87	5.6±1.5	161.1	0.0001
	Median(range)	2(1-4)	6(2-7)		
Cough exercise technique	Mean± SD	2±0.82	3.8±1.4	89.3	0.0001
	Median(range)	2(1-4)	4(1-5)		
Practice of inhaler technique	Mean± SD	18.6±4.9	44.3±8.4	137.8	0.0001
	Median(range)	19(10-29)	45(28-55)		

Wicoxon sign rank test $p < 0.05$:statistically significant

Table 5: Relation between asthmatic patients knowledge and their demographic characteristics in pre study phase,(n=70):

Variables	Studied group knowledge level pre intervention						n.	χ^2	p
	Good n.3		Satisfactory n.17		Poor n.40				
	No.	%	No.	%	No.	%			
Gender									
Males	3	7.0	14	32.6	26	60.5	43	6.2	0.032*
Females	0	.0	3	11.1	24	88.9	27		
AGE									
31-40 years	3	15.0	8	40.0	9	45.0	20	18.57	0.001*
41-50 years	0	.0	9	29.0	22	71.0	31		
51-60 years	0	.0	0	.0	19	100.0	19		
EDUCATION									
Illiterates	0	.0	0	.0	28	100.0	28	35.8	0.0001*
read and write	0	.0	15	48.4	16	51.6	31		
Educated	3	27.3	2	18.2	6	54.5	11		
OCCUPATION									
Manual work	3	7.0	14	32.6	26	60.5	43	6.9	0.032*
House wives	0	.0	3	11.1	24	88.9	27		
MARITAL									
Married	3	4.3	17	24.3	50	71.4	70		
RESIDENCE									
Rural	0	.0	8	14.8	46	85.2	54	25.11	0.0001*
Urban	3	18.8	9	56.3	4	25.0	16		
SMOKING									
non smoker	0	.0	6	13.6	38	86.4	44	14.31	0.001*
Smoker	3	11.5	11	42.3	12	46.2	26		
ACTIVITY.LEVEL									
mild activity	0	.0	0	.0	38	100.0	38	33.25	0.0001*
moderate activity	3	9.4	17	53.1	12	37.5	32		
family history of asthma									
No	0	.0	3	8.3	33	91.7	36	15.19	0.001*
Yes	3	8.8	14	41.2	17	50.0	34		

χ^2 :Chisquare test, * $p < 0.05$ statistically significant, $p > 0.05$ nonsignificant

Table 6: Relation between asthmatic patients behavior about medication and their demographic characteristics in pre study phase (n=70):

Variables	Studied group behavior level pre intervention						n.	χ^2	p
	Good n.12		Satisfactory n.18		Poor n.40				
	No.	%	No.	%	No.	%			
Gender									
Males	11	25.6	12	27.9	20	46.5	43	7.04	0.03*
Females	1	3.7	6	22.2	20	74.1	27		
AGE									
31-40 years	3	15.0	6	30.0	11	55.0	20	4.03	0.4
41-50 years	8	25.8	6	19.4	17	54.8	31		
51-60 years	1	5.3	6	31.6	12	63.2	19		
EDUCATION									
Illiterate	1	3.6	9	32.1	18	64.3	28		
read and write	8	25.8	6	19.4	17	54.8	31	6.51	0.16
Educated	3	27.3	3	27.3	5	45.5	11		
OCCUPATION									
Manual work	11	25.6	12	27.9	20	46.5	43	7.04	0.03*
House wives	1	3.7	6	22.2	20	74.1	27		
MARITAL									
Married	12	17.1	18	25.7	40	57.1	70		
RESIDENCE									
Rural	5	9.3	18	33.3	31	57.4	54	13.9	0.001*
Urban	7	43.8	0	.0	9	56.3	16		
SMOKING									
non smoker	6	13.6	9	20.5	29	65.9	44	3.72	0.16
Smoker	6	23.1	9	34.6	11	42.3	26		
ACTIVITY.LEVEL									
mild activity	3	7.9	15	39.5	20	52.6	38	10.6	0.005*
moderate activity	9	28.1	3	9.4	20	62.5	32		
family history of asthma									
No	6	16.7	6	16.7	24	66.7	36		
Yes	6	17.6	12	35.3	16	47.1	34	3.55	0.17

Table 7: Relation between asthmatic patients practice and their demographic characteristics in pre study phase (n=70):

Variables	Studied group practice level pre intervention				n.	χ^2	p
	Good n.9		Satisfactory n.61				
	No.	%	No.	%			
GENDER							
Males	7	16.3	36	83.7	43	1.17	0.28
Females	2	7.4	25	92.6	27		
AGE							
31-40 years	3	15.0	17	85.0	20	4.05	0.13
41-50 years	6	19.4	25	80.6	31		
51-60 years	0	.0	19	100.0	19		
EDUCATION							
Illiterate	1	3.6	27	96.4	28	4.49	0.11
read and write	5	16.1	26	83.9	31		
Educated	3	27.3	8	72.7	11		
OCCUPATION							
Manual work	7	16.3	36	83.7	43	1.17	0.28
House wive	2	7.4	25	92.6	27		
MARITAL							
Married	9	12.9	61	87.1	70		
RESIDENCE							
Rural	5	9.3	49	90.7	54	2.73	0.099
Urban	4	25.0	12	75.0	16		
Smoking							
non smoker	6	13.6	38	86.4	44	.06	0.8
Smoker	3	11.5	23	88.5	26		
activity level							
mild activity	5	13.2	33	86.8	38	.007	0.94
moderate activity	4	12.5	28	87.5	32		
family history of asthma							
No	5	13.9	31	86.1	36	.07	0.79
Yes	4	11.8	30	88.2	34		

χ^2 :Chisquare test, $p>0.05$ nonsignificant

Table 8: Relation between asthmatic patients knowledge and their demographic characteristics in post intervention program (n=70):

Variables	Studied group knowledge level post intervention						n.	χ^2	p
	Good n.54		Satisfactory n.6		Poor n.10				
	No.	%	No.	%	No.	%			
Gender									
Males	30	69.8	4	9.3	9	20.9	43	4.3	0.12
Females	24	88.9	2	7.4	1	3.7	27		
AGE									
31-40 years	13	65.0	3	15.0	4	20.0	20	4.08	0.39
41-50 years	24	77.4	3	9.7	4	12.9	31		
51-60 years	17	89.5	0	.0	2	10.5	19		
EDUCATION									
Illitrate	24	85.7	1	3.6	3	10.7	28	3.05	0.55
read and write	23	74.2	3	9.7	5	16.1	31		
Educated	7	63.6	2	18.2	2	18.2	11		
OCCUPATION									
Manual work	30	69.8	4	9.3	9	20.9	43	4.3	0.12
House wive	24	88.9	2	7.4	1	3.7	27		
MARITAL									
Married	54	77.1	6	8.6	10	14.3	70		
RESIDENCE									
Rural	42	77.8	4	7.4	8	14.8	54	.43	0.81
Urban	12	75.0	2	12.5	2	12.5	16		
SMOKING									
non smoker	37	84.1	4	9.1	3	6.8	44	5.4	0.07
Smoker	17	65.4	2	7.7	7	26.9	26		
ACTIVITY.LEVEL									
mild activity	32	84.2	3	7.9	3	7.9	38	2.96	0.23
moderate activity	22	68.8	3	9.4	7	21.9	32		
family history of asthma									
No	28	77.8	3	8.3	5	13.9	36	.017	0.99
Yes	26	76.5	3	8.8	5	14.7	34		

χ^2 :Chisquare test, p>0.05 nonsignificant

Table 9: Relation between asthmatic patients behavior about medication and their demographic characteristics in post intervention program (n=70):

Variables	Studied group behavior level post intervention						n.	χ^2	p
	Good n.56		Satisfactory n.12		Poor n.2				
	No.	%	No.	%	No.	%			
GENDER									
Males	34	79.1	7	16.3	2	4.7	43	1.32	0.52
Females	22	81.5	5	18.5	0	.0	27		
AGE									
31-40 years	13	65.0	6	30.0	1	5.0	20	5.94	0.2
41-50 years	26	83.9	5	16.1	0	.0	31		
51-60 years	17	89.5	1	5.3	1	5.3	19		
EDUCATION									
Illitrate	24	85.7	3	10.7	1	3.6	28	2.01	0.73
read and write	24	77.4	6	19.4	1	3.2	31		
Educated	8	72.7	3	27.3	0	.0	11		
OCCUPATION									
Manual work	34	79.1	7	16.3	2	4.7	43	1.32	0.52
House wive	22	81.5	5	18.5	0	.0	27		
MARITAL									
Married	56	80.0	12	17.1	2	2.9	70		
RESIDENCE									
Rural	42	77.8	10	18.5	2	3.7	54	0.99	0.61
Urban	14	87.5	2	12.5	0	.0	16		
SMOKING									
non smoker	37	84.1	6	13.6	1	2.3	44	1.24	0.54
Smoker	19	73.1	6	23.1	1	3.8	26		
ACTIVITY.LEVEL									
mild activity	32	84.2	5	13.2	1	2.6	38	0.97	0.62
moderate activity	24	75.0	7	21.9	1	3.1	32		
family history of asthma									
No	30	83.3	5	13.9	1	2.8	36	0.56	0.76
Yes	26	76.5	7	20.6	1	2.9	34		

χ^2 :Chisquare test, p>0.05 nonsignificant

Table 10: Relation between asthmatic patients practice and their demographic characteristics in post intervention program (n=70):

Variables	Studied group practice level post intervention				n.	χ^2	p
	Good n.39		Satisfactory n.31				
	No.	%	No.	%			
Gender							
Males	26	60.5	17	39.5	43	1.2	0.31
Females	13	48.1	14	51.9	27		
AGE							
31-40 years	8	40.0	12	60.0	20		
41-50 years	19	61.3	12	38.7	31	2.82	0.24
51-60 years	12	63.2	7	36.8	19		
Education							
Illiterate	18	64.3	10	35.7	28	1.51	0.47
read and write	16	51.6	15	48.4	31		
Educated	5	45.5	6	54.5	11		
Occupation							
Manual work	26	60.5	17	39.5	43	1.02	0.31
House wives	13	48.1	14	51.9	27		
Marital							
Married	39	55.7	31	44.3	70		
residence							
Rural	29	53.7	25	46.3	54	.39	0.53
Urban	10	62.5	6	37.5	16		
Smoking							
non smoker	26	59.1	18	40.9	44	.55	0.46
Smoker	13	50.0	13	50.0	26		
Activity level							
mild activity	21	55.3	17	44.7	38	.007	0.93
moderate activity	18	56.3	14	43.8	32		
Family history of asthma							
No	22	61.1	14	38.9	36	.88	0.35
Yes	17	50.0	17	50.0	34		

χ^2 :Chisquare test, p:>0.05 nonsignificant

Table 11 : Correlation matrix between patients' knowledge score, Patients ' practice score. patients ' behavior score a t pre and post intervention program(n.70):

Variables		patients' knowledge score		patients' practice score	
		r	P	R	p
Pre	patients' knowledge score	1			
	Patients ' practice score	0.14	0.25	1	
	Patients ' behavior score	0.55	0.0001	0.49	0.0001
post	patients' knowledge score	1			
	Patients ' practice score	0.62	0.0001	1	
	Patients ' behavior score	0.71	0.0001	0.44	0.0001

(r) correlation coefficient ** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).

Discussion

The role of nurses is pivotal in the management of asthma as they are often needed in the dissemination of information as well as demonstration of how patients should use their medications. This was also observed in our study which revealed the knowledge gap

in the training on asthma and inhaler technique among the nurses.

This study aimed to evaluate the effect of training program regarding self-care management practices for bronchial asthma patients.

Regarding to the demographic characteristics of the studied group, : It was found that 61.4% of patients with asthma were males and 38.6% were females. It was also found that 44.3% of asthma patients were in the age group between 41-50 years. This agrees with **Ali & Abou Elmaati. (2016)**. Who studied Outcome of An Educational Program on Bronchial Asthma Self-Management said that Male cases were 52.6% while female cases were 47.4%.

Regarding patients education 44.3% of the studied patients had read and write while 40.0% had illiterates. In addition to 61.4% of the study, patients had manual work and 38.6% had wives at home. With regard to marital status, 100.0% of married. With regard to residence 77.1% of the rural study. Regarding smoking, 62.9% are non-smokers. Regarding activity level, 54.3% are mild activity. Regarding family history of asthma, 51.4% are no family history of asthma. It is similar to the study of **Elbanna et al. (2017)** who reported that 46.43% had positive family history of bronchial asthma. It was also found that 54% of patients with asthma suffer from asthma attacks in the winter. It was also found that 25% of patients with asthma suffer from asthma attacks in the spring. It was also found that 70% of patients with asthma notice taking inhaled medications (twice or more).

The result of this study showed that the student nurses had satisfactory knowledge of asthma and there was a remarkable improvement in asthma knowledge after intervention.. It increased from 4.3% before the training program to 77.1% after the training program, this agree with **Ali & Abou Elmaati. (2016)**who reported that After program, the percent of good knowledge was increased to 77.3% with statistically significant difference between before and after program ($P < 0.001$). This is contrary to what **Pinnock et al 2010** reported , where specialist nurses in primary and secondary care had a good knowledge of asthma.

The results shows that there was a high level of patients' knowledge of asthma regarding the behavior of the inhaler medication from 17.1% to 80% after the training program. , showed that there was a

statistically significant level of patients' knowledge about asthma regarding the practice of inhalation technique, it increased from 12.9% before the training program to 44.3% after the training program . this in accordance with **Desalu., et al. 2012** who studied that Impact of Educational Interventions on Asthma Knowledge and MDI who revealed that revealed the knowledge gap on the inhaler technique among the post basic nursing students.

The results shows that there was an information about the effectiveness of a post intervention program in improving medication behavior among different demographic groups. The data shows that a high percentage of females (81.5%) and housewives (81.5%) had good behavior about medication after the intervention. This suggests that the program was successful in improving medication adherence among these groups.

Based on the **Makhinova. (2022)** Bivariate analyses were conducted to determine whether there were changes in outcomes from the pre to post period. Of 36 recruited patients, 17 completed both pre and post surveys. At baseline, patients had a mean ACT score of 15.1 ± 3.5 , with 94% having uncontrolled asthma, and an average of 4.2 ± 2.5 reported barriers. The following barriers were most common: not having an Asthma Action Plan (52.9%), use of inhaler more or less often than prescribed (47.1%) and forgetfulness (41.2%). The ACT score increased by 2.7 ± 5.4 , which was not statistically significant; however, it might be clinically significant. Two barrier scores improved as a result of the intervention. Preliminary evidence on the feasibility of identifying and addressing patient-specific barriers to adherence delivered by pharmacists showed that it has the potential to resolve barriers and improve asthma outcomes.

Furthermore, **Amin., et al. (2020)** the data indicates that illiterate patients also showed significant improvement in medication behavior, with 85.7% of them exhibiting good behavior about medication after the intervention. This is an important finding, as illiteracy can often be a barrier to understanding medication instructions and adhering to medication regimens.

Another **Jie., et al. (2013)** noteworthy finding is that no urban patients had poor behavior about medication after the intervention. This suggests that the program was effective across different demographic groups, including those living in urban areas.

The results shows that there was post intervention program was successful in improving medication behavior among the participants, particularly among females, housewives, and illiterate patients. The results of this study could be useful in designing future interventions to improve medication adherence among different demographic groups.

Based on the information provided, it appears that there is a strong correlation between patients' knowledge and behavior scores both before and after the intervention program, as well as a strong correlation between patients' practice scores and behavior scores before and after the program. The fact that the p-value is 0.0001 indicates that these correlations are statistically significant, meaning that they are unlikely to have occurred by chance. This that the intervention program was effective in improving patients' knowledge and practice, which in turn led to improvements in their behavior. Overall, these findings are encouraging and that the intervention program was successful in achieving its goals.

This agrees with the **Ghozali, & Urrohmah, (2023)** most participants had a low level of knowledge (66%;n=66), followed by a good level of knowledge (34%;n=34). Regarding the levels of asthma control, it could be confirmed that 61% (n=61) of study participants had uncontrolled asthma, followed by partially controlled (35%;n=35), and controlled (4%;n=4). In terms of the relationship between two variables (patient knowledge of self-management and asthma control levels), the results of Pearson Chi-Square showed a p-value of 0.001, highlighting a relationship between the patient's knowledge of self-management and levels of asthma control.

Ethical approval: The study was certified by the Faculty of nursing Research Ethics Committee, Zagazig University and the

included participants signed a written informed consent.

The target populations were:

Target population were asthmatic patient having mild to moderate bronchial asthma, over 20 years old, without significant comorbidity. The sample size was estimated based on the bronchial asthma prevalence among Egyptian adults that was 6.7% (**Alavinezhad & Boskabady (2018)**). Considering the confidence interval 95% and the power of the study 80%, the calculated sample was 65 patients. It was increased to 70 patients to avoid dropout of the participants. The asthmatic patients who attended the Chest Hospital Clinic from 10:00 am till 2:00 pm daily for 3 days per week during the period from the 1st of May 2022 till the end of December 2022 and fulfilled the inclusion criteria for participation in the study. The total number of attendees during the period of study (above 20 years old) was 360. The number of populations, which were asthmatic and met the requirements for inclusion, was 80 subjects, Except 10 subjects for the pilot study, and the study was performed on 70 patients after the drop-out of cases through the study.

This study was conducted in two phases, first phase was a pre-test evaluation of asthmatic patient using a predesigned questionnaire followed by implementation of an educational program and the post-test evaluation.

Limitations of the study:

Some patients refused to participate in the study and it was difficult to convince them, and scheduling lectures with clinics in the hospital was very difficult in terms of time and place. Some of the participating patients were unable to read and write, we helped them to fill out the questionnaires and we explained it to them. Some lectures were shortened to reduce the feeling of the bored people because the aim was awareness.

Conclusion

The post-implementation asthma training program was found to be significantly improved. The study demonstrated notable differences in the program's implementation

before and after, across all aspects examined. It showed enhanced knowledge of self-management techniques for asthma, improved inhaler usage, and better asthma control following the program. The findings suggest that implementing a training program for asthma patients positively impacts all aspects of self-management.

Recommendation:

Based on the finding of the present study, it is recommended to:

- Promotion and enhancement of the self-care management to the patient through show picture about triggers, allowed foods, and follow up should be continued after termination of the treatment through the rehabilitation program.
- Providing regular training about the using of inhaler and nebulizer.

For further researches:

- Studying the patient's satisfaction after implementation of the applied program.
- Prospective follow-up studies are needed to develop and refine interventions to improve patient's adherence to treatment and prevent further deterioration.

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