

The Effect of Bronchial Asthma Self-Care Management Model on Older Adults' Coping with their Daily Living Activities

Zainab Gazar Alkotb Alagamy¹, Hanaa Abou El-soued Hussein²,
Sharbat Thabet Hassanin¹

¹ Faculty of Nursing, Fayoum University, Egypt

² Faculty of Nursing, Alexandria University, Egypt

Abstract: Persistent bronchial asthma is a prevalent chronic respiratory condition resulting in high rates of morbidity and mortality among older adults. The daily living activities of older patients with asthma is significantly affected, they often experience episodes of inactivity, therefore, controlling asthma and preventing exacerbations requires scrupulous attention to self-care management skills. **Aim:** To examine the effect of bronchial asthma self-care management model on older adults' coping with daily living activities **Design:** A pre-experimental design (one group pre-test post-test study). **Setting:** The study was conducted in three outpatient clinics in Al Mahalla Hospital for pulmonary and allergy diseases, Tanta, Egypt. **Subjects:** The study sample consisted of a convenient sample of 104 older adults with bronchial asthma. **Tools:** six tools were used for data collection: 1) Socio-demographic Characteristics of Older Adults with Bronchial Asthma Structured Interview Schedule, 2) Barthel Index (BI), 3) Knowledge of Older adults with Bronchial Asthma Structured Interview Schedule, 4) Medication Adherence Reporting Scale (MARS), 5) A Standardized Checklist of Steps in the Proper Use of a Metered Dose Inhaler (MDI) and a Dry Powder Inhaler (DPI), 6) Self-monitoring of Asthma Control and Avoidance of Asthma Triggers Questionnaire. **Results:** The study revealed that, there was highly statistical significant improvement in older adults' self-care knowledge and self-care practices post-program than before. A positive significant correlation between older adults' self-care knowledge, the proper use of inhaler, self-monitoring of asthma control & avoidance of asthma triggers and their activity of daily living was found post interventions. A negative correlation between the study subjects' adherence to asthma medications and their activities of daily living was found prior the implementation of the program. **Conclusion:** the application of the proposed asthma self-care management model is effective in improving older adults' coping with their daily living activities. **Recommendation:** development of educational programs for all nurses and other health care providers in hospitals focusing on helping elderly asthma patients how to cope with their daily living activities, and treatment regimen affected by bronchial asthma.

Keywords: Asthma, Activity of Daily living, Self-management Model, Older Adults, Medication Adherence, inhaler technique.

I. INTRODUCTION

Asthma is one of the major non communicable diseases. It is a chronic disease of the air passages of the lungs which termed airways or bronchial tubes. These bronchial tubes normally allow the air to come in and out of the lungs. In case of Asthma, the airways are always inflamed, congested, and they become more swollen and the muscles around it can tighten when something triggers the symptoms , consequently, this makes it difficult for air to move in and out of the lungs ⁽¹⁾. This pathology can cause asthma symptoms such as coughing, wheezing, shortness of breath, and a feeling of

tightness or even pain around the chest. Attacks of asthma are often caused by allergic and non-allergic causes. Allergic causes as exposure to pollens or mold, and exposure to dust. Non-allergic triggers include smoke, pollution in the air, cold air or changes in weather and high physical or mental stress⁽²⁾.

World Health Organization (WHO) recognizes that asthma is a major public health problem⁽³⁾. The Organization plays a role in coordinating international efforts against the condition. The aim of its strategy is to support Member States in their efforts in order to reduce the disability and premature death related to asthma. According to WHO criteria, About 235 million people currently suffer from asthma. Most deaths occur in older adults.⁽⁴⁾ WHO also indicated that about 30% of older adults suffer from asthma is more rapidly developed in males than females. The rate of asthma is accelerated for approximately 5 to 8 years after age of 50 years old⁽⁵⁾.

In Egypt, there are 7-15% of older adults had asthma; this included the first attack in old age and who had suffered from the disease at long life. About 50% of those had not diagnosed because they think that signs and symptoms are a part of normal age, other health problems, obesity, inactivity, or side effect of medications. Additionally, a diagnosis of asthma may be mistaken in older adults with other health conditions are similar to asthma symptoms as congestive heart failure, chronic bronchitis, and emphysema, much more prevalent among them, particularly those who are smokers^(3, 5, 6).

Older adults with asthma are at risk of developing persistent fatigue due to respiratory infections such as influenza and pneumonia consequently, they become frail and they lose their independence in performing daily living activities⁽⁷⁾. Older adults' activities of daily living (ADL) are significantly affected by symptoms of asthma which intern reflected negatively on their quality of life⁽⁸⁾. One of the best ways to evaluate the health status of older adults is through functional assessment, which comprises of measuring of elderly persons' ability to perform ADL such as feeding, bathing, dressing, grooming, toileting, and mobility additionally, their ability to perform instrumental activities of daily living (IADL) as housekeeping, laundry, food preparation, and shopping, moreover, the ability to taking medication, and using public transportation⁽⁹⁾. This helps the gerontological nurses and other health care providers to detect problems in performing activities of daily living in addition to, plan and intervene appropriately.

In this context, establishing guidelines and identifying interventions to reduce the risk or to provide public health services for older adults with asthma are crucial in management of and coping with increasing dependence caused by asthma symptoms^(10, 11). Patient self-care is a key component of effective management of the asthma symptoms and improved patient outcomes. The proposed asthma self-care management model aims to reduce disability and premature death due to asthma exacerbation, reduce the overall cost of therapeutic regimen, and improve sufferers' quality of life⁽¹²⁾. Asthma self-care management interventions is the provision of an granted, written personalized action plan which advises on regular using of asthma medication, recognizing deterioration and decide the appropriate action to take⁽¹³⁾. Furthermore, asthma self-care management model focuses on Self-monitoring of Asthma symptoms and avoidance of asthma triggers, also, teaches the patients how to cope with limited activities of daily living, when and how to seek professional help^(2, 6).

In this respect, the nurse who work in Primary health care and pulmonary specialty practices outpatient clinic and deal with older adults with asthma should develop such model for self-care of asthma. This model should be personalized according to the severity of symptoms, treatment regimens; the asthma triggers that the patient may have⁽²⁾. All of that positively reflect on physical, functional, emotional, and social well-being of older adults with asthma.

II. AIM OF THE STUDY

The aim of this study was to examine the effect of bronchial asthma self-care management model on older adults' coping with their daily living activities.

Research hypothesis:

Older adults with bronchial asthma cope effectively with their daily living activities post following the proposed asthma self-care model than before.

III. MATERIALS AND METHODS

Research design:

A pre-experimental research design (one group pre-test post-test) was utilized in this study.

Setting:

The study was carried out in three (3) outpatient clinics affiliated to Al Mahalla Hospital for Pulmonary and Allergy Diseases, Tanta, Egypt.

Subjects:

A convenient sample of 104 older adults diagnosed with bronchial asthma and attending the above mentioned setting and fulfilling the following criteria:

- Aged 60 years and more.
- Free from any debilitating diseases such as heart failure, renal failure and Chronic Obstructive pulmonary Diseases (COPD).
- Able to communicate effectively.

The sample size was estimated using the EPI info 7.0 program based on these parameters; population size: 1020 over six months, expected frequency: 7% ⁽³⁾, acceptable error: 5%, confidence coefficient: 95%, design effect: 1, the minimum sample size was 102 reached to 104.

Tools: In order to collect the necessary data for the study six tools were used:

Tool I: Socio-demographic Characteristics of Older Adults with Bronchial Asthma Structured Interview Schedule

It was developed by the researchers after reviewing the relevant literature to obtain the necessary information related to age, sex, educational achievement, marital status, occupation before retirement, monthly income, number of family members, and history of smoking.

Tool II: Barthel Index (BI)

BI was developed by Barthel et al (1965) ⁽¹⁴⁾. It is the most appropriate instrument to assess functional status as a measurement of older adults' ability to perform activities of daily living independently. The tool was translated into Arabic language by Hallaj (2007) ⁽¹⁵⁾. This Arabic version was used in the current study. The tool was tested for content validity and reliability $r = 0.971$. The scale consisted of 10 items namely; feeding, dressing & undressing, bathing, toileting, controlling bowel, controlling bladder, moving from chair to bed & return, getting on & off toilet, walking on level surface, and ascend & descend stairs. A score of Zero (0) was given when elderly cannot meet criteria as defined dependent, one (1) was given when he needs help, and two (2) was given when he is independent. The total Score of the scale is 20 and classified as shown in the following table:

Level of independency	Scores
Dependent	0-7
Independent with help	8-12
Independent	13-20

Tool III: Knowledge of Older adults with Bronchial Asthma Structured Interview Schedule

This tool was developed by the researchers after reviewing the relevant literature. It was used to assess the knowledge of the studied older adults about meaning of asthma, its signs and symptoms, causes of asthma and risk factors. Additionally, Older adults' awareness of food and medications that trigger symptoms of asthma, causes of asthma exacerbation & warning signs, preventive measures, diagnostic procedures, and its treatment regimen ^(4, 10).

Responses of the studied older adults were measured on 3-point likert scale where "2" for correct and complete answers, "1" for correct but incomplete answers, and "0" for completely incorrect answers . The total score is divided into the following:

Level of knowledge	Scores
Good knowledge	$\geq 75\%$
Fair knowledge	$50\% - < 75\%$
Poor knowledge	$< 50\%$.

Tool IV: Medication Adherence Reporting Scale (MARS)

This scale was developed by Thompson et al. (2000)⁽¹⁶⁾ and it was adopted by Cohen et al. (2009)⁽¹⁷⁾. The MARS comprises of ten (10) items describing non-adherent behavior. It was used in the present study in order to measure the studied older adults' adherence to asthma controller medications; inhaled corticosteroids (ICS) and leukotriene receptor inhibitors (LRI).

Older adults with asthma are asked to score their own behavior regarding the frequency of the different aspects on the following response scales:

The studied older adults' response	Scores
Always	1
often	2
sometimes	3
rarely	4
never	5

The total score ranging between 10 and 50 points, a higher score indicates higher adherence to the prescribed asthma controller medications.

Tool V: A Standardized Checklist of Steps in the Proper Use of a Metered Dose Inhaler (MDI) and a Dry Powder Inhaler (DPI)

This checklist was designed by Manzella et al. (1989)⁽¹⁸⁾ it was used in the current study to assess the studied older adults' ability to administer their asthma controller medication. It includes 8 and 7 steps in the use of the devices, respectively, covering the essential elements of use from preparation of the devices to their actuation and delivery of the medications. **The steps for MDI are:** 1) Shake inhaler well and remove protective cap, 2) Hold inhaler upright, 3) Breathe out gently away from inhaler, 4) Place mouthpiece between lips and teeth without biting and close lips to form good seal, 5) Start to breathe slowly through mouth and at the same time press down firmly on canister, 6) Continue slow and deep inhalation, 7), Remove inhaler from mouth when inhalation complete, and 8) Hold breath 5-10 seconds. While, the steps for DPI are: 1) Prepare the inhaler, 2) Keep inhaler horizontal, 3) Exhale to residual volume, 4) Place mouthpiece between lips and teeth, 5) Inhale forcefully and deeply, and 6) Remove inhaler from mouth when inhalation complete

The researchers observed the participants and documented the number of steps correctly completed; they defined adequate technique as correct completion of 6 of 8 steps for the MDI and 5 of 7 steps for the DPI. Each step in the checklist was classified as Yes "1" and No "0". The total score is divided into the following:

The studied older adults' ability to administer their asthma controller medications	Scores
Proper use of asthma medication (MDI & DPI)	50 - ≥70%
Improper use of asthma medication (MDI & DPI)	<50%,

Tool VI: Self-monitoring of Asthma Control and Avoidance of Asthma Triggers questionnaire

This tool was developed by Busse et al. (2005)⁽¹⁹⁾ it was used in the present study to assess whether or not the studied older adults practice preventive measures and avoidance of asthma triggers. It includes 7 items as follows: **four (4) items for preventive measures:** 1) use allergy covers, 2) Clean bed sheets in hot water, 3) the presence of another person to clean mold, dust in the home, and 4) whether a fur-bearing animal was kept in the home in the last 6 months.

Each item was classified as Yes "1" and No "0". The total score is divided into the following:

The studied older adults' practice of preventive measures and avoidance of asthma triggers	Scores
Good practice	50 - ≥70%
Poor practice	<50%,

This tool also, includes **Three (3) items for avoidance of asthma triggers:** 5) Keep windows closed in spring and summer, 6) Never allow smoking in home, and 7) Never allow to presence of any fur animal in the home. These items measured on 5- Likert scale as follows: always, often, sometimes, rarely, and never. The latter three items were coded as always or often versus other^(17, 19).

Method:

1. An official letter was issued from the Faculty of Nursing, Fayoum University and forwarded to the director of Al Mahalla Hospital for Pulmonary Diseases, Tanta, Egypt to obtain the permission to attend the clinics. Then, the study purpose and schedule of data were clarified.
2. Tool I and tool III were developed by the researchers based on thorough systematic review of relevant literature then; tool IV, tool V, and tool VI were translated by the researchers into Arabic language. The Arabic version of all these tools was tested for content validity by five (5) experts in the related field. The necessary modifications were done according to the experts' valuable comments.
3. The reliability of tool IV, tool V, and tool VI were tested on 20 older adults with bronchial asthma in order to measure the internal consistency of these tools by using Cornbrash's alpha test. $r = 0.84$ for tool IV, $r = 0.88$ for tool V, and 0.87 for tool VI.
4. A pilot study was carried out on 10 older adults with bronchial asthma; they were not included in the study participants. It was done in order to test the clarity and applicability of the tools, test wording of the questions and estimate the time needed for the interview. Also, to detect any obstacles or problems that might arise in data collection.

Development of asthma self-care management model

5. The proposed asthma self-care model was developed by the researchers based on reviewing the most recent related literature. The program comprises knowledge and skills needed for asthma control among older adults with bronchial asthma which in turn reflected on their coping with daily living activities. **Self-care knowledge** included information about meaning of asthma, its symptoms, causes, and risk factors, food and medications that trigger symptoms of asthma, causes of asthma exacerbation & warning signs, preventive measures, diagnostic procedures, and treatment regimen. **Self-care practices** consisted of skills help the studied older adults to adhere to asthma controller medications such as inhaled corticosteroids (ICS) and leukotriene receptor inhibitors (LRI), teach them the steps of the Proper Use of a Metered Dose Inhaler (MDI) and a Dry Powder Inhaler (DPI), self-monitoring of asthma control, and how to avoid Asthma Triggers.

Primary assessment outcome and fieldwork

6. Older adults with bronchial asthma who fulfilled the inclusion criteria were interviewed individually by the researchers in the waiting area of the clinics using tools from I to VI In order to obtain the baseline data (**Pre-test phase**). The interview took around 30-45 minutes, this according to the interviewers' level of understanding and comfort. This phase cover a period of two months, from the beginning of October 2017 till the end of November 2017.
7. The telephone numbers of all participants were taken in order to arrange for program's sessions.

Program conduction phase

8. The proposed program conducted on group bases of 8 groups in total. Each group included 13 older adults with bronchial asthma, 30-45 minutes/session, twice/month, four groups /day. The sessions were carried out in the Quality Assurance Unit with the permission of the responsible supervisor nurse. The total number of sessions was 48sessions, 6 sessions per each group. This phase covered a period 6 months from the beginning of December 2017 till the end of May2018.
9. Before the conduction of the program session, the researchers prepare the environment to be calm and comfortable for each member in the groups, well ventilated, and have adequate lighting. The researchers were distributing the designed manual booklet on each participant in order to clarify the desired knowledge and skills. This booklet contains the illustrative colored pictures and the main points of each session of asthma self-care management model as follows:

Session 1: Taking into consideration the use of simple language according to the educational level.	<ul style="list-style-type: none"> - Welcoming and introduction - Goal setting - What is asthma mean? - What are asthma symptoms? - What are the causes and risk factors of asthma in older adults? - What are the warning signs and diagnostic measures? - What is self-care management mean? - What are its principles?
Session 2 Discussion, motivation and reinforcement during program/media used/ session were used to enhance learning	<ul style="list-style-type: none"> - Welcoming - summary about the previous session - Medication Adherence : <ul style="list-style-type: none"> • Describing the 10 items of non-adherent behavior • Demonstrating the proper technique of medication adherence.
Session 3: A standardized checklist of steps in the proper use of a metered dose inhaler (MDI) and a dry powder inhaler (DPI)	<ul style="list-style-type: none"> - Welcoming - Summary about the previous session - Teach the participants the correct 7 steps during use of inhaler - Demonstrate technique to (MDI) and (DPI) - Care with medication
Session 4: Self-monitoring of asthma control and avoidance of asthma triggers	<ul style="list-style-type: none"> - Welcoming - Summary about the previous session - Teach the participants the correct 7 items to control and avoidance of asthma triggers
Session 5: Activities of daily living	<ul style="list-style-type: none"> - Welcoming - Summary about the previous session - Teach the participants how to cope with limited activities
Session 6: Medicines used for the treatment of asthma	<ul style="list-style-type: none"> - Welcoming - Identify medicines used for treatment of asthma - Advantage and importance of medication used - How to deal with medication - Discussion and negotiation - Obtain feedback from the participants

10. Teaching methods included group discussion, role-playing, demonstration and re- demonstration, models (Pluvial and Aerolizer inhalers), pictures (inhaler use), and leaflets (environmental control).

11. Action plan calendar were prepared and given to each participant to identify obstacles hinder the achievement of needed goals.

Evaluation/follow up phase

12. To evaluate the effectiveness of the proposed program, reassessment of each participant was done after two weeks from ending the implementation of the program. This took 2 months evaluation from mid of June 2018 to the mid of August 2018. Then, the difference between pre- interventions and post-interventions scores was determined through using the proper statistical analysis.

13. The total period of data collection, including the three phases of the program covered a period of 10 months and a half, from the beginning of October 2017 till the mid of August 2018.

Ethical consideration:

- Informed witness consent was obtained from each participant after explanation of the study purpose.
- Confidentiality of the collected data was maintained.
- Privacy, anonymity, and the right to withdraw at any time were assured.

Statistical analysis:

The collected data were coded and analyzed using PC with the Statistical Package for Social Sciences (SPSS version 21). Tabulated frequency and percentages were calculated. The Chi-square test was used for testing relationship between

categorical variables. Pearson correlation (r) was used to find out the correlation of two quantitative variables. The difference was considered significant if $P \leq 0.05$.

IV. RESULTS

The age of the study participants ranged from 60 to 86 years with a mean of 71.98 ± 6.65 years, 80.0% were males, 82.7% were married, 68.2% had either primary education or illiterate, 65.5% were either employees or workers, 52.9% reported that their monthly income was not enough, 78.9% lived with three to five family members or relatives, and around one half of them (48.9%) were smokers.

Figure (1) describes that before the implementation of asthma self-care model, more than one half (55.0%) of the study subjects had moderate degree of bronchial asthma, 30% had mild degree. While, only 15.0% of them had severe asthma, whereas after the implementation of the proposed program, these percentages were improved to 40.0%, 50.0%, and 10.0% respectively.

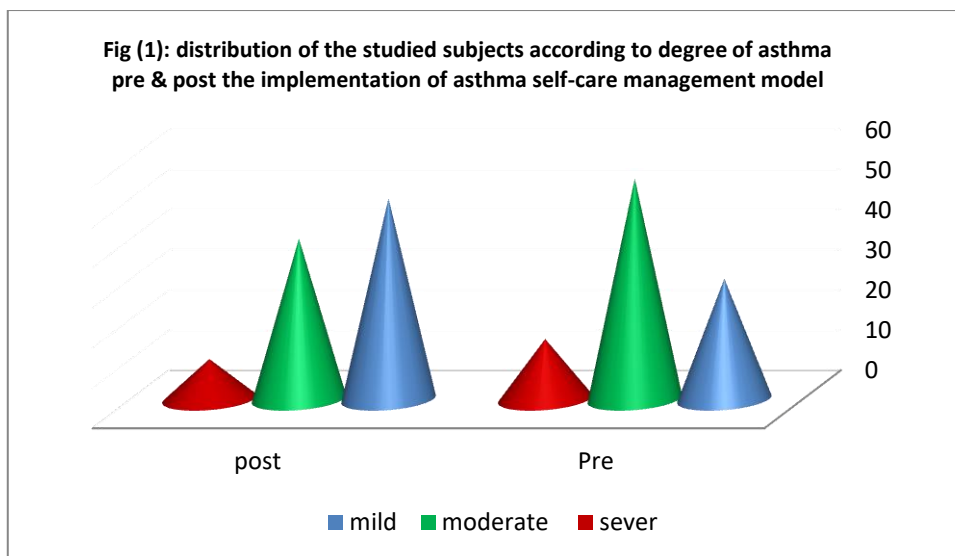


Figure (2) clarifies that more than one half (56.0%) of the study subjects were dependent in performing of their activities of daily living according to Barthel Index, 40.0% of them were independent with help, and very small percent (8.0%) of them were independent.

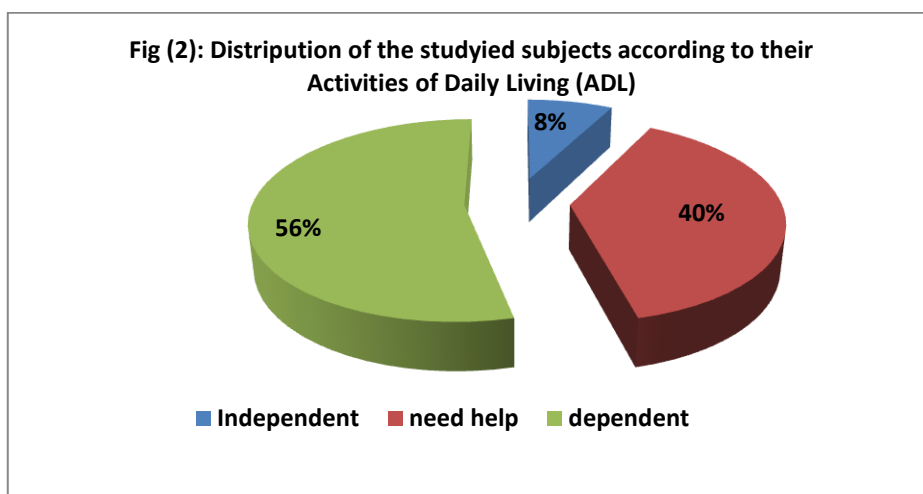


Figure (3) illustrates that before the implementation of the proposed asthma self-care management model, one half of the study subjects were totally dependent in performing their daily living activities had either mild degree of asthma (25.0%) or moderate degree (25.0%), whereas, they decreased to 12.0% and 7.0% respectively post-program. This figure also

portraits that prior the intervention, less than one third (29.0%) of the study subjects who were independent with help in performing their daily living activities had moderate degree of asthma and they decreased to one quarter (25.0%) after the implementation of the proposed program.

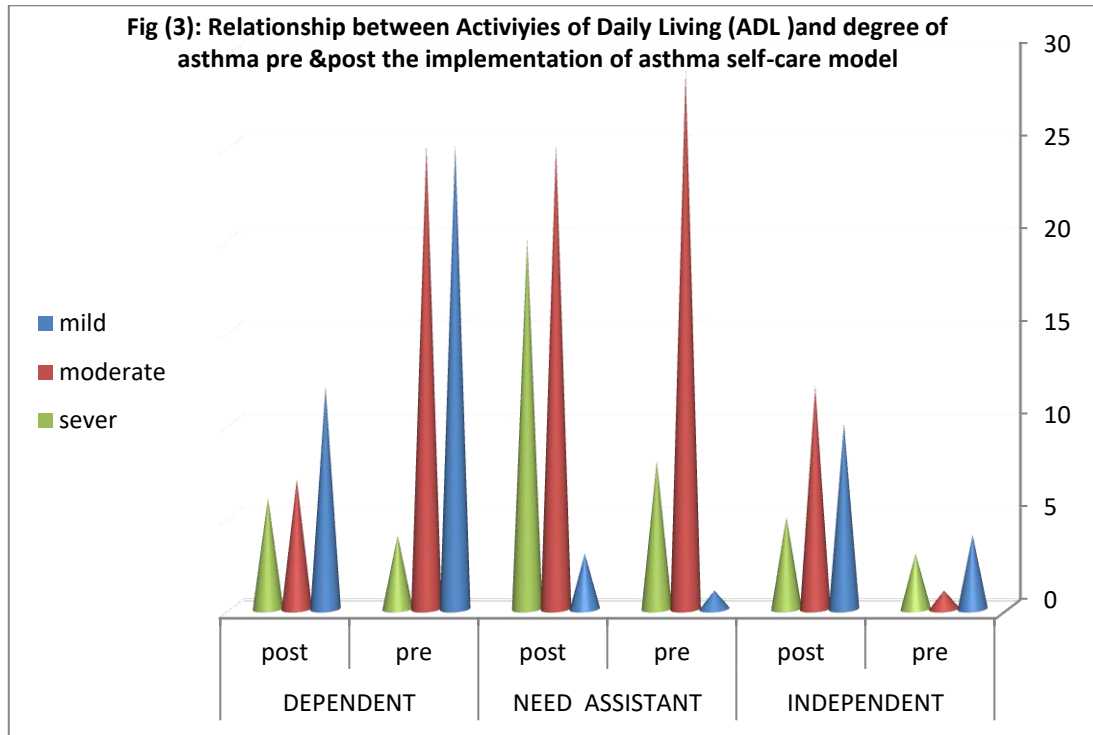


Table (1) reflects that there was highly statistically significant improvement in the level of self-care knowledge of the study subjects post the implementation of asthma self-care management model in relation to meaning of asthma and its symptoms, main causes, risk factors, warning signs, causes of exacerbation, and their awareness of food and medications that trigger asthma if compared to its level before the implementation of the program ($\chi^2= 127.055$ $P= 0.0001^*$, $\chi^2= 132.610$ $P= 0.0001^*$, $\chi^2= 140.400$ $P= 0.002^*$, $\chi^2= 140.106$ $P= 0.0001^*$, $\chi^2= 129.361$ $P= 0.0001^*$, and $\chi^2= 120.220$ $P= 0.0001^*$) respectively.

Table (1): The effect of asthma self-care model on knowledge of older adults with bronchial asthma

Knowledge level of older adults with bronchial asthma	The studied subjects (no.=104)				Test of significance χ^2	P value P
	Pre-program		Post-program			
	no.	%	no.	%		
Definition and symptoms						
Poor	62	59.6	3	2.9	127.055	0.0001*
Fair	31	29.8	10	9.6		
Good	11	10.6	91	87.5		
Main causes						
Poor	55	52.9	0	0.0	132.610	0.0001*
Fair	41	39.4	16	15.4		
Good	8	7.7	88	84.6		
Risk factors						
Poor	77	74.0	0	0.0	140.400	0.002*
Fair	18	17.3	17	16.3		
Good	9	8.7	87	83.7		
Warning signs						
Poor	59	56.7	0	0	140.106	0.0001*
Fair	37	35.6	13	12.5		
Good	8	7.7	91	87.5		

causes of exacerbation						
Poor	70	67.4	3	2.9	129.361	0.0001*
Fair	23	22.1	10	9.6		
Good	11	10.5	91	87.5		
Their awareness of food and medications that trigger asthma						
Poor	57	54.8	0	0.0	120.220	0.0001*
Fair	33	31.7	14	13.5		
Good	14	13.5	90	86.5		

* Statistically significant at $p \leq 0.05$

$\chi^2 =$ Chi-square test

Table (2) shows that there was highly statistically significant improvement in the study subjects' adherence behavior to asthma medication such as inhaled corticosteroids (ICS) and leukotriene receptor inhibitors (LRI) after the implementation of asthma self-care management model in comparison to its level before the implementation of the program $\chi^2 = 141.696$ $P = 0.0001^*$.

A) Adherence to Asthma Medications

Table (2): The effect of asthma self-care model on practices of older adults with bronchial asthma

The studied subjects' adherence behavior to asthma medication	The studied subjects (no.=104)				Test of significance χ^2	P value
	Pre-program		Post-program			
	no.	%	no.	%		
Adherent	27	26.0	102	98.1	141.696	0.0001*
Non-adherent	77	74.0	2	1.9		

* Statistically significant at $p \leq 0.05$

$\chi^2 =$ Chi-square test

Table (3) reveals that before the implementation of asthma self-care management model, more than three quarters of the study subjects (77.9%) were use improper technique for inhalation of asthma controller medications (MDI & DPI) while, after the implementation of the program, the vast majority of them (91.3%) use the inhalers properly and the statistical difference was highly significant $\chi^2 = 153.642$ $P = 0.0001^*$.

B) Proper Use of a Metered Dose Inhaler (MDI) and a Dry Powder Inhaler (DPI)

Table (3): The effect of asthma self-care model on practices of older adults with bronchial asthma

Inhalation Technique	The studied subjects (no.=104)				Test of significance χ^2	P value
	Pre-program		Post-program			
	no.	%	no.	%		
Proper use of asthma medication (MDI & DPI)	23	22.1	95	91.3	153.642	0.0001*
Improper use of asthma medication (MDI & DPI)	81	77.9	9	8.7		

* Statistically significant at $p \leq 0.05$

$\chi^2 =$ Chi-square test

Table (4) Shows that after implementation of asthma self-care management model, there was obvious improvement in the study subjects' practice of preventive measures in order to control asthma and to avoid its triggers than before. The statistical difference between pre-program and post-program was reach to significant level $\chi^2 = 140.94$ $P = 0.0001^*$.

C) Practice of Asthma Preventive Measures (Asthma control measures) and Avoidance of Asthma Triggers

Table (4): The effect of asthma self-care model on practices of older adults with bronchial asthma

Asthma Preventive Measures & Avoidance of Asthma Triggers	The studied subjects (no.=104)				Test of significance χ^2	P value
	Pre-program		Post-program			
	no.	%	no.	%		
Good Practice	20	19.2	97	93.3	140.94	0.0001*
Poor practice	84	80.8	7	6.7		

* Statistically significant at $p \leq 0.05$

$\chi^2 =$ Chi-square test

Table (5) illustrates that there was apparent improvements in the level of independency in performing the activities of daily living among the study subjects after the implementation of asthma self-care management model than before. The difference between those who were totally dependent, those who were independent with help, and those who independent pre-program and post-program was statistically significant $\chi^2= 23.120$ $P=0.0001^*$.

Table (5): The effect of asthma self-care model on Activites of Daily Living (ADL) of older adults with bronchial asthma

Activities of Daily Living (ADL)	The studied subjects (no.=104)				Test of significance	P value
	Pre-program		Post-program			
	no.	%	no.	%		
Totally dependent	56	53.8	3	2.9	χ^2 23.120	P 0.0001*
Independent with help	40	38.5	48	46.2		
Independent	8	7.7	53	50.9		

*Statistically significant at $p \leq 0.05$

χ^2 = Chi-square test

Table (6) reflects that there were highly significant positive correlations between level of self-care knowledge about Asthma, inhalation technique, and asthma control measures & avoidance of asthma triggers among the study subjects and their activities of daily living post intervention ($r = 0.97^{**}$ $p = 0.000^*$, $r = 0.96^{**}$ $p = 0.000^*$, $r = 0.93^{**}$ $p = 0.002^*$) respectively than before the intervention ($r = 0.29$ $P = 0.519$, $r = 0.56$ $P = 0.075$, $r = 0.20$ $P = 0.810$) respectively.

On the other hand, this table also shows that there was a negative correlation between the study subjects' adherence to asthma medications and their activities of daily living prior the implementation of the program ($r= -0.12$ $P=0.799$). Whereas, this relation was affected positively post-program ($r=0.97^{**}$ $P = 0.001^*$)

Table (6): The correlation between domains of asthma self-care management model and Activities of Daily Living (ADL) pre & post the implemrntation of the program

Domains of asthma self-care management model	Activities of Daily Living (ADL) The studied subjects (no.=104)			
	Pre-program		Post-program	
	r	p value	r	P value
Knowledge about Asthma	0.29	0.519	0.97**	0.000*
Adherence to Asthma Medications	-0.12	0.799	0.97**	0.001*
Inhalation Technique	0.56	0.075	0.96**	0.000*
Asthma Control Meaures & Avoidance of Asthma Triggers	0.20	0.810	0.93**	0.002*

*Statistically significant at $p \leq 0.05$

r= Pearson correlation

V. DISCUSSION

Asthma is a common disease among people over age 65. Asthma in older population can cause serious health problems if not treated appropriately. It creates a considerable greater risk for older adults since they are more expected to develop respiratory failure resulting from the asthma, even during mild attack^(20, 21). Asthma symptoms can be treated by a variety of prescribed medications that provide quick relief as well as long term control. In older asthma patients, treatment can be complicated because of a lot of older people take many drugs for different health problems, asthma medications may react with these drugs leading to serious adverse reactions also, they more likely to have mental confusion or memory problems; these problems can make it difficult for them to follow treatment instructions. In addition to, some types of asthma medications as L-shaped metered dose inhaler may difficult to use by older adults this needs a degree of manual coordination and special skills⁽²²⁾.

In older asthmatic patients, the applied interventions to increase the outcomes of asthma have been studied rarely and self-care management programs may not be applicable in this age group. Thus, asthma in those patients needs extra considerations to disease process, diagnostic measures and treatment regimen⁽²¹⁾. In this regard, knowledge and skills

about asthma self-care management should be a priority for future intervention programs in order to promote specific behavioral strategies for asthma prevention also, health education considered as an important part in the management of asthma and strongly recommended for older adults with asthma ⁽²²⁾.

Therefore, the aim of the present study is to examine the effect of bronchial asthma self-care management model on older adults' coping with their daily living activities.

The result of the current study revealed that the study subjects aged between 60 to 86 years with a mean of 71.98±6.65 years. This result may be due to age-related changes in respiratory functions, the declines associated with aging in their immunity, and other multiple common disorders and conditions in old age. This result was matched to a study done by Hanania et al. (2011) ^(23, 24) who reported that asthma presenting at an advanced age and often has serious clinical and physiologic consequences. They also indicated that older asthmatic patients are more likely to be hospitalized than younger asthmatic patients, also comorbid illnesses and the psycho-social effects of aging might affect the diagnosis, clinical presentation, and care of asthma in this population.

The finding of the present study also indicated that the majority of the study subjects were males. This may because of around one half of them had history of smoking in the last year. This finding was contradicted by data from Australian Center for Asthma Monitoring (ACAM) and data from USA that asthma is more prevalent in females aged over 65 years than men who in the same age group. Additionally, older females are hospitalized more than twice as often as older males ^(25, 26).

Concerning the study subjects' occupation before retirement, the result showed that approximately two thirds of them were work as either employees or workers in different industries and companies. The explanation for this finding may be the fact that they work in different environments which increase the risk for long-term exposure to substances may trigger asthma symptoms such as dust, fumes, gases or vapors, and smokes. This is consistent with what reported by American Academy of Allergy Asthma and Immunology (2019) which stated that in the United States, up to 15% of asthma cases may be job-related in which asthma is caused by inhaling fumes, gases, dust or other potentially harmful substance ⁽²⁷⁾. In relation to another risk factor for asthma among the study subjects is over crowding; more than three quarters of them were lived with three to five family members or relatives in the same home. This is supported by what Baker et al. ⁽²⁸⁾ indicated in their study in which household crowding increases the risk of infectious diseases spreading, especially respiratory as asthma.

Self-care management is a dynamic, deliberate process that begins with recognizing a change in symptoms, deciding to take action, application of treatment measures, and evaluating of the treatment applied. Asthma self-care management is directed toward accomplish the best possible health outcomes, prevent negative consequences, and reduce the morbidity and mortality rates among older adults ⁽²⁹⁾. In the present study, asthma self-care refers to the behaviors developed by older adults to maintain their health and decisions they make to manage of and deal with asthma symptoms. Asthma self-care management model covers and encompasses certain domains; increase older asthmatic patients' knowledge about asthma process and mechanism, its symptoms, causes and risk factors, warning signs, and causes of exacerbation. Moreover, adherence to therapeutic regimen, using proper technique of inhalation, following protective measures to control asthma, and avoiding asthma triggers ^(30, 31). Consequently, this reflects positively on their coping with limited daily living activities.

In older adults with asthma, self-care management may be more difficult because of they don't recognize that they are prone to experience asthma, and they don't think asthma to be a mainly serious disease, especially if it compared to other diseases as heart failure and liver diseases ⁽³²⁾. Unfortunately, these facts were similar to one of notable present study' results which reflected that prior the implementation of the proposed asthma self-care model, the study subjects had poor self-care knowledge (table 1) The interpretation for this finding may be related to that more than two thirds of the studied subjects had low level of education and they may experience lack of awareness of asthma process and its danger so, they underestimate the significance of the problem, it leads them to ignoring the symptoms and lacking of attention to seeking professional help, moreover it creates some difficulties in following the treatment regimen. This interpretation was in agreement with Rosas-Salazar et al. (2012) ⁽³³⁾ who reported that the primary contributor to poor asthma self-care

management and poor health outcomes in general is inability of the patients to acquire, practice, and realize basic information and services needed to make appropriate decisions regarding their health. The previous result of the current study was contradicted by the study done by Burkhart et al. (2018)⁽³⁴⁾ who studied the effectiveness of routine self-monitoring of peak flow in patients with asthma and found that more than one third of the sample were either completed their university education or finished their postgraduate studies.

Luckily, there was highly statistically significant progression in the level of self-care knowledge of the study subjects post the implementation of the intended asthma self-care management model in relation to all aspects of asthma in older adults (table 1). This progress may be related to the researchers were strive to explain each domain of the proposed asthma self-care management model in a simple manner and they used to use well prepared and systematized audiovisual materials as pictures, models, and leaflets that aid in achieve the intended goals of the program. Furthermore, the program was introduced on 6 sessions; in each one, the researchers were cover certain knowledge and skills required by asthmatic older adults in concerning with mechanism of asthma, its causes and risk factors, causes of exacerbation, measures to control asthma, and measures to avoid its triggers. This is helping them in management their symptoms and promote asthma outcomes.

This result was supported by Gibson et al. (2004)⁽³⁵⁾ who studied the effects of an asthma self-management intervention have been evaluated in a systematic review of 36 randomized controlled trials involving 6090 participants with an optimal self-management program and they concluded that a reduction in the proportion of subjects with asthma requiring admission to hospital, an emergency room visit for asthma, or an urgent visits to the physician was occur after the application of the program. Moreover, the present study result in relation to asthma self-care knowledge was in consistent with Durna et al. (2009)⁽³⁶⁾ and (2009) Kohler et al. (2010)⁽³⁷⁾ who studied self-management education and regular practitioner review for adults with asthma; they found a significant increase in awareness and practice after the program. Additionally, this result was parallel to the result of one study conducted by Espinoza et al. (2015)⁽³⁸⁾ who investigated older females' knowledge and risk perceptions about asthma and its treatment; they reported that the participants get good score of knowledge post introduce the intervention. One study done by Perez et al. (2019)⁽³⁹⁾ wasn't contradict the result of the current study in which they examine the effect of guided self-management on views of health professionals and patients and they indicated that the majority of the participants had good knowledge scores after the program application with statistically significant difference in the total score of knowledge pre and post the program.

Another interpretation for post-program improvement of study subjects' knowledge related to asthma self-care is the written action plan calendar which prepared by the researchers and given to the study subjects. It is a crucial part of the self-management of asthma and facilitates the achievement of the desired goals. This interpretation is the same as suggestion from a case-control study of older people who had died from asthma reflected that the presence of an action plan was a major protective factor against death from asthma⁽⁴⁰⁾. This opinion was opposed to the views of certain primary care physicians who astonishingly indicated that action plan wasn't a main concern for patients to manage their asthma. This observation was explained by the supposed barriers in primary care such as the short consultation duration⁽⁴¹⁾.

Another prominent finding in the current study was indicated that before the application of the proposed asthma self-care model, the study subjects failed to maintain satisfactory self-care management practices in relation to their adherence to asthma medications (table 2), their use of inhalation devices such as metered dose inhaler and dry powder inhaler (table 3), and also they failed to practice measures to prevent asthma or which called asthma control measures and they didn't follow the measures to avoid asthma triggers (table 4). The reasons for decreased self-care practices among the studied subjects may be due to several causes; **first**, the harshness of asthma symptoms. Asthmatic older adults often complain of chest tightness, recurrent cough, wheezing, and shortness of breath with prolonged or forced exhalation. Asthma may be associated with sinusitis, nasal secretions, and may be allergic skin problems⁽⁴²⁾ these symptoms have huge adverse impact on patients' daily living activities in which they always feel fatigue and often report that their activities are limited. This view was supported by one finding in the present study in which more than one half of the study subjects were dependent on their caregivers in performing of their activities of daily living and very small percent (8.0%) of them were independent (figure 2). That is may be behind the low level of asthma self-care management practice among them. The

finding is congruent with Schreck et al. (2018)⁽⁴³⁾ and Forsen et al. (2011)⁽⁴⁴⁾ who stated that life style and activities of daily living were negatively affected by asthma.

The **second** reason for inadequate self-care management practices among the study subjects is limited financial resources; more than one half of them reported that their monthly income was not enough for bring asthma medications and difficulties of access to inhaler devices. It leads them to assume non-adherent behavior toward therapeutic regimen (table 2). This is similar to Goeman et al. (2007)⁽⁴⁵⁾ who reported that the main cause of medication non-adherence among retired seniors is the cost of medications. Also, a demographic study done in Chicago (2004) on 380 low-income older adults found that only 18% were compliant with medications, this was mostly due to the cost of medications^(46,47).

Other causes for poor self-care practice among the studied asthmatic patients may be related to the possible cognitive changes, vision-related problems, loss of coordination, and arthritic changes associated with aging process that make it difficult to use asthma controller medications as metered-dose inhalers and dry powder inhaler (table 3). Consequently, affect negatively asthma outcomes.

Teaching older adults with asthma and their caregivers is an active role and it considered as the most important concern in asthma management⁽²³⁾. In this regard, the result of this study reflected that there was an observed and a significant improvement in the studied asthmatic older adults' self-care practices (table 2, 3, and 4) post the implementation of the proposed asthma self-care model. This improvement can be explained by the involvement of asthma sufferers in their care plan allow them to take appropriate decision regarding their condition and help them to monitor asthma symptoms. This enhances older adults' trust in their ability to control their own disease.

Also, the proposed asthma self-care model contains the knowledge as well as the skills required to help older adults to learn how to use inhaler devices properly for asthma medications as metered-dose inhaler and how to use nebulizers for dry power inhaler. The researchers were explaining the steps of proper use of inhaler devices by demonstration and re-demonstration, using models, distribute leaflets and brochures. This help in overcoming older adults' memory problems, improve their concentration, and grasping their attention. Additionally, the researchers introduce all knowledge and practices needed for enhancing the study subjects' adherence to asthma medications in addition to measures to control asthma and measures to avoid provoking asthma. The studies done by Caplin et al. (2011)⁽⁴⁸⁾, Holgate et al. (2018)⁽⁴⁹⁾ and Francis et al. (2019)⁽⁵⁰⁾ proved the current study finding and summarized that self-regulation and self-management program has positive impact on asthmatic patients' knowledge and skills in relation to management asthma symptoms and adherence to asthma controller medications than prior to the program application.

Remarkably, the present study result illustrated that the proposed asthma self-care model has positive effect on the degree of asthma among the study subjects (figure 1) consequently; it is significantly affected on their level of independency (table 5) this may because of the introduced asthma self-care model helps asthmatic patients to develop strategies to cope with daily activities even when experiencing symptoms. The finding is congruent with a qualitative investigation of the impact of asthma and self-management strategies among older adult done by O'Connor et al. (2016)⁽⁵¹⁾.

The current study findings reflected that there were highly significant positive correlations between domains of the proposed model among the study subjects and their activities of daily living post intervention than before (table 6). For more clarification, teaching older adults through asthma self-care model can improve their knowledge and skills to managing of asthma symptoms and enhancing its outcomes. This result was similar to what is reported by Mancuso et al. (2009)⁽⁵²⁾ and McDonald et al. (2006)⁽⁵³⁾ that is patient education is the key component of asthma self-care management.

VI. CONCLUSION AND RECOMMENDATIONS

In This study, asthma self-care model was warrantee for improving older adults' self-care knowledge and practices regarding adherence to medications, inhalation technique, and asthma control measures & avoidance of asthma triggers. Hence it positively reflected on the studied asthmatic older adults' coping with their daily living activities.

Recommendations:

- In-service training programs should be developed for all nurses and other health care providers in hospitals focusing on helping elderly asthma patients how to cope with their daily living activities, and treatment regimen affected by bronchial asthma.

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- Educational booklets, posters, flyers, and pamphlets should be designed and disseminated among older adults with bronchial asthma who attend outpatients clinics specialized for Pulmonary and Allergy Diseases. These materials include brief knowledge about asthma symptoms, risk factors, warning signs, asthma triggers, and measures to control asthma. Additionally, it include standardized steps of proper use of inhalation devices. This in order to raise asthmatic older adults' knowledge and skills required to asthma self- care management.
- A written asthma management plan should be developed by interdisciplinary team comprises physician gerontological nurse, and psychologist in order to summarize specific treatment and lifestyle practices for asthmatic older adults including what to do when asthma symptoms become out of control.

Recommendations for future researches:

- There is an urgent need to develop an effective health care model for asthmatic older adults that emphasizes the best care of asthma, with continuing researches to ensure best practice in order to enhance asthma outcomes in this age group.
- The awareness of the community should be raised through mass media that asthma can develop in older adults and that complains of respiratory symptoms is not a normal part of the ageing process. This is through development and application of certain measures to identify of undiagnosed asthma cases and to help the sufferers to manage and control their respiratory symptoms.

REFERENCES

- [1] R. Aroni, A. Sawyer, S. Abramson, M. Stewart, K. Thien, F. Goeman, "Asthma-self management: What do we really mean?" Australian Journal of Primary Health, Vol. 44, No. 3, PP.10-17, Aug. 2013.
- [2] R. Allen, M. Jones, B. Oldenburd, "Randomized trial of an asthma self-management program for adults", Thorax Journal, Vol. 50, No. 1, PP. 731—738, 2012.
- [3] World Health Organization. (2018).Chronic Respiratory Diseases. Available at: <http://www.who.int/respiratory/asthma/definition/en/>.
- [4] Asthma Foundation NSW. (2012). Asthma Action Plan. Available at: <http://www.asthmafoundation.org.au/asthmaactionplan.aspx>.
- [5] Australian Bureau of Statistics. (2018). Health Literacy, Australia. ABS Cat. No. 4233.0 Available at: <http://www.ausstats.abs.gov.au/Ausstats/subscriber.nsf/0/73ED158C>.
- [6] R. J. Adams, S. L. Appleton, C. L. Hill, R. E. Ruffin, D. H. Wilson, "Inadequate health literacy is associated with increased asthma morbidity in a population sample", Journal of Clinical Immunology, Vol. 124, No. 3, PP. 601-602, Sep. 2009.
- [7] Z. Durna, S.OZcan, "Evaluation of Self-management education for asthmatic patients" Journal of Asthma, Vol. 40, No. 6, PP. 631-643, Oct. 2003.
- [8] B.P. Dunleavy, "How to manage your asthma as you age. Available at: <http://www.everydayhealth.com/hs/adult-asthma/management-age/>
- [9] Z. T. Osakwe, E. Larson, M. Agrawal, M.J. Shang, "Assessment of activity of daily living among older adult Patients in home health care and skilled nursing facilities: An integrative review", Journal of Home Health Care Now, Vol. 35, No. 5, PP. 258-267, May, 2017.
- [10] V. Backer, H. Nolte, L. Pedersen, N. Dam, H. Harving, "Unawareness and under treatment of asthma: Follow-up in a different geographic area in Denmark", Journal of Allergy, Vol. 64, No. 8, PP. 1179-1184, Jul. 2009.
- [11] V. McDonald., S. A. Hiles, K. A. Jones, V. L. Clark, J. Yorke, "Health-related quality of life burden in severe asthma, The Medical Journal of Australia, Vol. 209, No. 2 Suppl. PP. S28-S33, Aust.. 2018.
- [12] H. Pinnock, "Supported self-management of asthma", Breathe Sheff, Vol. 11, No.2, PP. 98-109, Jun. 2015.

International Journal of Novel Research in Healthcare and Nursing

 Vol. 6, Issue 1, pp: (396-412), Month: January - April 2019, Available at: www.noveltyjournals.com

- [13] Australian Institute of Health and Welfare (AIHW), Asthma in Australia 2018 Canberra: Australian Institute of Health and Welfare.
- [14] D. Barthel, I. Mahoney, "Functional evaluation: The Barthel Index. Mary Land State", Medical Journal, Vol. 16, No. 2, PP. 56-61, 1965.
- [15] F. Hallaj. "Activity Patterns of residents in elderly homes. Unpublished Master Thesis, Faculty of Nursing, Alex University, 2007.
- [16] K. Thumpson, J. Kulkarni, A.A. Sergejew, "Reliability and validity of a new Medication Adherence Rating Scale (MARS) for the psychoses", Schizophrenia Research, Vol. 42, No. 3, PP. 241-247, May, 2000.
- [17] J.L. Cohen, D.M. Mann, J.P. Wisnivesky, R. Home, H. Leventhal, T.J. Musumeci-Szabo, E.A.Halm, "Assessing the validity of self-reported medication adherence among inner-city asthmatic adults: the Medication Adherence Report Scale for Asthma", Annals of Allergy, Asthma, and Immunology, Vol. 103, No.4, PP. 325-331, Oct. 2009.
- [18] B.A. Manzella, C.M. Brooks, J.M. Richards, R.A. Windsor, S.J. Soong, W.C. Bailey, "Assessing the use of Metered Dose Inhalers by adults with asthma", Journal of Asthma, Vol.26, No.4, 1989.
- [19] P.J. Busse, J.J. Wang, E.A Halm," Allergen sensitization evaluation and allergen avoidance education in an inner-city adult cohort with persistent asthma", Journal of Allergy, Clinical Immunology, Vol. 116, No. 1, PP. 146-52, 2005.
- [20] Asthma in older adults Available at: <http://www.asthmaandallergies.org/asthma-allergies/asthma-in-older-adults>.
- [21] G. Ciprandi, A. Vizzaccaro, I. Cirillo, M. Tosca, G. Passalacqua, G. W. Canonica, "Under diagnosis and under treatment of asthma: A 9-year study of Italian conscripts", International Archives Allergy Immunology, Vol. 125, No. 1, PP. 211-215, 2011.
- [22] K.L. Andrews, S.C. Jones, J. Mullan, M.M. Eval "Asthma self-management in adults: A review of current literature", The Australian Journal of Nursing Practice, Scholarship & Research, Vol. 21 No. 1, PP. 33-41, March 2014.
- [23] N.A Hanania, M.J King, S.S Braman, C. Saltoun, R.A. Wise, P. Enright, A.R. Falsey, S.K. Mathor, "Asthma in the elderly: Current understanding and future research need-a report a national institute on aging Workshops", Journal of Allergy and Clinical Immunology, Vol. 128, No.3, PP. 4-24, Sep, 2011.
- [24] A. Gillman, J.A.Douglass, "Asthma in the elderly" Journal of Asia Pacific Allergy, Vol.2, No. 2, PP.101-108, Apr, 2012.
- [25] Australian Center for Asthma Monitoring (ACAM) Available at: <http://www.asthamonitoring.org>.
- [26] J. AKinbamil, J.E. Moorman, S. Liux, "Asthma prevalence, health care use, and mortality", National Health Statistics Report: United States, 2005-2009 Hyattsville: National Center for Health Statistics, No. 32, 2011.
- [27] Occupational asthma, American Academy of Allergy, Asthma, and Immunology 2019 Available at: <http://www.aaaai.org/conditions-and-treatment/library/asthma-library/occupational-asthma>
- [28] M.G.Baker, A. McDonald, J. Zhang, P. Howden-Chapman, "Infectious diseases attributed to household crowding in New Zealand: A systematic review and burden of disease estimate Wellington: Hekainaga Oranga\Housing and Health Research Program, University, of Otego 2013". Available at: <http://www.healthy housing.org>
- [29] B.P. Dunleavy, "Managing asthma for older adults": How to manage your asthma as you age Available at: <http://www.everydayhealth.com/hs/adult-asthma/management-age/>
- [30] K.R. Karanched, L.H. Carpenter, A.P. Baptist, A "self-regulation intervention can decrease asthma exacerbations among older adults", The Journal of Allergy and Clinical Immunology, Vol.141, No. 2, PP. 209, 2018.

International Journal of Novel Research in Healthcare and Nursing

 Vol. 6, Issue 1, pp: (396-412), Month: January - April 2019, Available at: www.noveltyjournals.com

- [31] S.C. Jones, D. Iverson, P. Burns, U. Evers, P. Caputi, S. Morgan, "Asthma and aging: an user's perspective-the perceptions and problems with the management of asthma in the elderly", *Clinical & Experimental Allergy*, Vol. 41, No.1, PP.471-481, Apr. 2011.
- [32] K.L. Andrews, S.C. Jone, "We would have got it by now if we were going to get it: Analysis of asthma awareness and beliefs in older adults, *Health promotion Journal of Australia*, Vol. 20, No. 2, PP. 146-150, Aug. 2009.
- [33] C. Rosas-Salazarc, A.J. Apter, J.C. Cainog-Celedon, "Health literacy and asthma", *Journal of Allergy Clinical Immunology*, Vol. 129, No. 4, PP.934-942, Apr, 2012.
- [34] N.Burkhart, M. Abdalla, J. A. G Beattie, J. Buckingham, T.K., Lindsay, L. M. Osman, "Effectiveness of routine self-monitoring of peak flow in patients with asthma", *British Medical Journal*, Vol. 308, No. 1, 564-567, 2018.
- [35] P. Gibson, H. Powell, J. Coughlin, "Self-management education and regular practitioner review for adults with asthma", *The Cochrane library*.4-chichester.UK: John Wiley and sons 2004.
- [36] P. G. Durna, H. Powell, J. Coughlan, A. J. Wilson, M. Abramson, P. Haywood, "Self-management education and regular practitioner review for adults with asthma". *Cochrane Database of Systematic Reviews*, 2009).
- [37] R. B. Kohler, E. Ackloo, N. Sahota, H. P McDonald, X. Yao, "Interventions for enhancing medication adherence", 2010.
- [38] K. P. Espinoza, M. A. Mullee, M. Middleton, E. Chapman, S. T.Holgate, "Peak flow based asthma self-management: A randomized controlled study in general practice", *British Thoracic Society Research Committee, Thorax*, Vol. 50, No. 1, PP. 851-857, 2015.
- [39] A. Pérez, R. Pill, S. Adams, "Qualitative study on views of health professionals and patients on guided self-management", *British Medical Journal*, Vol. 321, No. 1 1507-1510, 2019.
- [40] D.P. Goeman, C.R. Jenkins, M.A. crane, S.Z. Bosnic-Anticevich, J.A. Douglass, "Un met need of older people with asthma: Cross-sectional survey", *Journal of Asthma*, Vol. 48, No. 9, PP. 865-875, 2011.
- [41] D.P. Goeman, C.D. Hogan, R.A. Aroni, M.J. Abramson, S.M. Sawyer, K. Stewart, A. Sandi, J.A. Douglass, "Barriers to delivering asthma care: a qualitative study of general practitioners", *Med Journal*, Vol. 183, No. 9, PP. 457-457, August, 2005.
- [42] Asthma new current researcher and opportunities for asthma seniors. Available at: <http://www.getastmahelp.Org\asthma-seniors-health-professional.aspx>
- [43] W. J. Schreck, "Asthma morbidity 6 years after an effective asthma self- management program in a Maori community. *European Respiratory Journal*, Vol. 15, No. 1, PP. 464-469, 2018.
- [44] R. D. Forsen, R. Ruffin, L. J. Fisher, D. H. Wilson, "Asthma symptoms associated with depression and lower quality of life: a population survey", *Med Journal*, Vol. 178, No. 1, PP. 437-441, Aust, 2011.
- [45] D.P. Goeman, J.A. Douglass, "Optimal management of asthma in elderly patients: strategies to improve adherence to recommended interventions", *Drugs Aging*, Vol. 24, No.5, PP. 381-394, 2007.
- [46] A. Malik, C.A. Saltoun, P.R. Yarnold, C.L.Crammer, "Prevalence of obstructive airways diseases: The disadvantaged elderly of Chicago, *Allergy Asthma Proc*, Vol. 25, No. 1, PP. 169-173, 2004.
- [47] K. Rance, M. O'laughlen, "Managing Asthma in older adults", *Journal for Nurse Practitioners JNP*, Vol. 10, No.1, 2014.
- [48] R. Caplin, J. Weinmanmm, "Self-regulation and self-management in asthma: Exploring the roles of illness perceptions and treatment beliefs in explaining non-adherence to preventer medication", *Psychology and Health Journal*, Vol. 17, No. 1, PP. 17-32, 2011.

International Journal of Novel Research in Healthcare and Nursing

Vol. 6, Issue 1, pp: (396-412), Month: January - April 2019, Available at: www.noveltyjournals.com

- [49] S. Holgate, K. McGrath, J. Covington, S. Cheng, H. Boushey, "Individualized asthma self-management improves medication adherence and markers of asthma control", *Journal of Allergy and Clinical Immunology*, Vol. 123, No. 1, PP, 840, 2018.
- [50] S.L. Francis, "Effects of individual self-management education on clinical, biological, and adherence outcomes in asthma", *The American Medical Journal*, Vol. 115, No.1, PP. 620-626, 2019.
- [51] R. O'Connor, M. Gagnon, M. Martynenko, D. Hauser, "A qualitative investigation of the impact of asthma and self-management strategies among older adults". *Journal of Asthma*, Vol.54, No.1, 2016.
- [52] C. A. Mancuso, W. S. Stayles, J. P. Allegrante, "Development and testing of the Asthma Self-Management Questionnaire, *Annals of Allergy Asthma and Immunology*, Vol.102, No. 1, PP. 294-302, 2009.
- [53] V. M. McDonald, P. G. Gibson, Asthma self-management education, *Chronic Respiratory Care*, Vol. 3, No. 1, 29-37, 2006.