

Effect of Nursing Intervention Program on Nurses Knowledge, Practices and Patients Outcomes with Bronchial Asthma

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Abstract

Asthma is one of the most common chronic diseases worldwide. Although asthma is a major cause of patient disability and in rare cases causes premature death and it has a profound impact on all aspects of a patient's life. The aim of this study was to evaluate the effect of a nursing intervention program on nurses' knowledge and practices and outcomes for patients diagnosed with bronchial asthma. A quasi experimental research design with pre and post-test assessment was used on 30 participants of nurses working in the Chest ICU and the Chest Department at Zagazig University Hospitals, Egypt and 30 adult patients diagnosed with acute severe bronchial asthma under their care. Structured interview tool was used to assess nurses' knowledge, an observation checklist for their practice and the Asthma Severity Assessment Scale and Breathlessness Scale for patients. The researcher developed nursing intervention program based on analysis of assessment data and using pertinent literature to teach nurses guidelines for dealing with patients diagnosed with acute severe asthma. This was delivered to nurses in 12 sessions. Evaluation was done immediately (post-test) and three months after implementation (follow-up), along with evaluation of the patients. The results showed marked deficiencies in nurses' knowledge and practices before the program, with significant improvements at the post and follow-up evaluations, associated with amelioration of the severity of asthma and dyspnea among studied patients. Therefore, a relatively short-term in service training programs for all nurses working in the Chest ICU and the Chest department is implemented to enable nurses to update their knowledge and practice. Evidence based protocols for patients diagnosed with bronchial asthma should be routinely implemented and evaluated.

Keywords: Bronchial asthma; Nursing intervention program; Patient's outcomes

Introduction

The global prevalence of asthma is anticipated to be approximately 4.5 percent. There are about 334 million patients with asthma affecting all age groups, across the world. The prevalence of asthma has increased over time and an additional 100 million people worldwide are expected to develop asthma by the year 2025 [1]. In Egypt it is estimated that bronchial asthma accounts for 6.9% of all respiratory disorders. Asthma deaths will likely increase by almost 20% in the next 10 years if urgent action is not taken. According to the 2012 WHO data, the prevalence of asthma has increased significantly since the 1970s. Asthma caused 250,000 deaths globally in 2009 [2]. The rising worldwide prevalence of bronchial asthma and the associated high health care costs have led to extensive study into its pathogenesis and treatment. Bronchial asthma is common chronic disease affecting 300 millions of people across the world and the number is increasing day by day [2].

Asthma is a chronic disease of airways; that is widely characterized by an increased responsiveness to a large variety of stimuli, airway inflammation and obstruction. Responsiveness to the treatment of asthma is good but sometimes resistance develops, and variability in symptoms also occurs due to the limited therapy adherence and awareness of patients [3].

The exact etiology of asthma remains unknown [4]. The airways of asthmatics are hypersensitive to certain triggers or stimuli, such as environmental stimulant allergens, tobacco smoke, cold or warm air, perfume, pet dander, moist air, exercise, exertion and emotional stress. In response to exposure to these triggers, the bronchi contract into spasm and produce an "asthma attack". Inflammation soon follows, leading to a further narrowing of the airways and excessive mucus production, coughing and other breathing difficulties [5].

Asthma can often be diagnosed on the basis of a patient symptoms and medical history. Measurement of lung functions by spirometry or Peak Expiratory Flow (PEF) meters provide assessment of the severity, reversibility and assessment of severity, reversibility and variability of airflow limitation, and help confirm the diagnosis of asthma [6]. Traditionally, Bronchial asthma is classified according to severity into intermittent, mild, persistent, moderate persistent or severe persistent depending on the grade of symptoms, airflow limitation and lung function variability. However, it is important to recognize that asthma severity involves both the severity of the underlying disease and its responsiveness to treatment. In addition, severity is not an unvarying feature of an individual patient's asthma, but may change over months or years [7].

The goal of BA care is to achieve and maintain control of the clinical manifestations of the disease for prolonged periods. When asthma is controlled, patients can prevent most attacks, avoid trouble some symptoms day and night, and keep physically active. To reach this goal, the asthmatic patient can learn how to avoid risk factors, take

medications correctly, understand the difference between “controller” and “reliever” medications, monitor their status using symptoms and, if relevant, PEF. They should also be able to recognize dangerous signs indicating that their asthma is worsening and take action or seek medical help as appropriate [8].

To improve the control of Bronchial asthma and reduce the needs for medication, patients should follow certain instructions. Although physical activity is a common cause of asthma, patients should not avoid exercises. Common strategies for avoiding allergens and pollutants include staying away from tobacco smoke, avoiding drugs, foods and additives if they are known to cause symptoms and reduce or preferably avoid exposure to occupational sensitizer [9].

The most common reasons for uncontrolled asthma are non-adherence to treatment and poor knowledge and skills in disease management. Inadequate education about the prevention of exposure to asthma triggers, the inability to prevent acute attacks and ineffective use of inhalers are the common reasons for uncontrolled asthma. Asthma education is a vital component in disease control and self-management. Patient education makes management of the disease cost effective and comprehensive [10].

Nurse can manage patients with bronchial asthma through assessment of respiratory condition, giving adequate hydration, promoting airway clearance, improving of breathing, and finally providing support to patient and family. Meanwhile, the nurse should observe patient's condition after providing care in order to evaluate such improvement. Therefore assessing level of knowledge and practice is very important to enhance and maintain competency of care [11].

Significance of Study

Despite all advances in the management of asthma, the morbidity and mortality rates are increasing. Both the nurse as well as patients play a pivotal role for the under treatment and mismanagement of the disease. This causes concern in the field of asthma care. Unless the patient possesses basic knowledge about the ailment and its management, there is no likelihood to make the best use of the available facilities. However, the nurses play a vital role in preventing asthma attacks or decreasing its severity focusing on the strategy for prevention and control of asthma in order to reduce the disability and mortality. Thus there's serious need for nursing intervention program to provide and improve basic nurses' knowledge and practice for the care of patients with bronchial asthma and improve patients' outcomes.

The aim of the study was to evaluate the effectiveness of nursing intervention program on nurses' knowledge and practices and outcomes for patients diagnosed with bronchial asthma. The research hypotheses were that nurses receiving intervention program will make significant improvement in their knowledge and practice, with decrease asthma severity and dyspnea grades due to bronchial asthma.

Subjects and Methods

Research design and setting

A quasi experimental research design with pre - post assessment of outcome was used in this study which was conducted in the Chest ICU and the Chest Department at Zagazig University Hospitals, Egypt. The intervention consisted of nursing intervention program for nurses dealing with diagnosed with acute severe asthma. It involved pre, post-and three months follow-up assessment.

Participants

The study involved a group of nurses, and another group of patients. The nurses' group consisted of 30 nurses working in the study settings who are dealing with patients diagnosed with acute severe asthma. The patients' group included 30 patients selected by purposive sampling of asthmatic patients before the program. Patient with chronic respiratory failure or comatose were excluded. Their age ranged between 22-60 years with more females (76.7%), and 60% being illiterate. The duration of asthma, about 93.3% of patients were more than ten years and 70% of them staying in hospital equal and more than one month.

Tool for data collection

The researcher created three tools: 1) a structured interview tool for nurses 2) a structured observational checklist for nurses' practice and 3) a structured interview tool for patients. The first tool consisted of two parts: characteristics of the nurse (age, marital status, qualifications, years of experience and years of experience in the Chest ICU and the Chest Department and attendance at training related to bronchial asthma) and questions to assess the nurses' knowledge about bronchial asthma. The researcher created closed questions and model answers to rate the nurses' knowledge of bronchial asthma. A correct answer was scored as 2 and incorrect answer was 0. The scores were totalled and converted into a percentage score. A nurse who achieved 75% or higher, total score was considered to have satisfactory level of knowledge. The second tool: Practice assessment section consisted of an observational checklist testing correct procedures for administration of oxygen therapy, positioning, nebulizer, breathing (pursed lipped, diaphragmatic and cough exercise), using an inhaler, inspiratory muscle training technique (incentive spirometry) and directions on the use of a peak flow meter. Again for scoring an item correctly performed was scored as 1 and incorrectly as 0. The scores were totalled and converted into percentage score. Nurses those who have achieved a total score of 75% or higher were considered to have satisfactory” level of practice, those with lower scores were deemed to have unsatisfactory level of practice [12].

The third tool, a Structured Interview Questionnaire for Patients, consisted of third parts. The first part gathered data about characteristics of the patient including: age, gender, marital status, level of education, etc...Part two was the Asthma Severity Assessment Scale adopted from Emery et al. [13] and the National Asthma Educational Program Guidelines. This scale consisted of three sub-scales: frequency of attacks per week, oral cortisone use and pulmonary function tests. Number of asthma attacks per week was scored as follows: 0=one attack or less per week; 1=2-6 attacks per week; 3=daily attacks. Oral cortisone use was scored as follows: 0=no usage; 1=sometimes during an attack; 2=usually during an attack and 3=daily. Pulmonary function tests were score as follows: 0=forced expiratory volume >80% of predicted value; 1=forced expiratory volume 60-80% of predicted value; 2=forced expiratory volume of <60% of predicted value. These three sub-scale scores were added together to calculate an overall asthma severity score.

The third and final tool, the Medical Research Council (MRC) Breathlessness Scale, was based on the work of the Global Initiative for Chronic Obstructive Pulmonary Disease [14]. The Breathlessness Scale assessed the severity of dyspnea and graded the effect of dyspnea on daily activities using a MRC grading scale from I-IV. Patients were asked to choose a sentence that best described their condition and level of activity. Responses ranged from Grade I or no impact on daily living

to Grade IV or almost complete incapacity. The tool was self-administered. If the subject was unable to self-administer, the researcher assisted by verbally asking the questions and recording the responses.

The face and content validity of the tools was established by a panel of seven experts in medical/surgical nursing and in medical/surgical nursing who reviewed them for clarity, relevance, comprehensiveness, understanding, applicability and ease for administration. Minor modifications were required.

Pilot study

A pilot study was conducted on five patients and five nurses who met selection criteria to evaluate and test the clarity, applicability, relevance and feasibility of the tools. Other goals of the pilot test were to identify difficulties in administering the tools and to estimate the time needed to complete the tools. Those who participated in the pilot study were excluded from the main study sample.

Study maneuver (Description of intervention)

The study was carried out through assessment, planning, implementation and evaluation phases. The assessment phase started with recruitment of patients according to eligibility criteria and with informed consent. The researcher collected baseline data using the finalized tools and these were taken as the pre-intervention baseline data. Each group of nurse's interview lasted 30-45 min.

In planning phase the researcher designed an intervention program based on the educational needs identified and guided by relevant literature [13]. It included theoretical as well as practical sections. The theoretical section provided background about bronchial asthma, causes, risk factors, signs and symptoms, diagnosis, and prevention as well as, medical and nursing management as nutrition, exercises, role of nurse pre, during and post asthma attack, follow up schedule. Moreover, a colour booklet was designed by the researcher and distributed to each nurse.

During the implementation phase, each nurse received intervention program. Each nurse received five theoretical and eight practical sessions. In the theoretical sessions, different teaching strategies were used such as mini lectures, group discussion, and media such as written materials, and videos. In practical sessions the researcher showed to nurse: proper administration of oxygen by mask and by nasal cannula, proper use of a nebulizer, proper patient positioning, proper use of an inhaler, performance of coughing and deep breathing exercises and how to use a peak flow meter, and incentive spirometry. Each nurse was given opportunity to perform these procedures after demonstration and re demonstration. The patient questionnaire filled by researcher within 20 min.

Evaluation phase included an immediate post-test and three month follow-up assessments of the effects of the nursing intervention program using the aforementioned tools. The field work was carried out three days weekly throughout a period of twelve months from May 2015 to May 2016.

Administrative design and ethical considerations

To carry out this study, the necessary approvals were obtained from the Head of ICU and Chest Department, and from the General Director of the Zagazig University Hospitals. Letters were issued to them from the Faculty of Nursing Zagazig University explaining the

aim of the study in order to obtain permission and cooperation. The study protocol was approved by competent committees. At the initial encounter with each patient or nurse, an oral consent was secured from each subject after being informed about the nature, purpose, procedures and benefits of the study and the participation is voluntary. Confidentiality and anonymity of any obtained information were ensured through coding all data. The researcher reassured participants that the data collected would be used only for the purpose of the study and to improve patients' health. No harm could be anticipated from any maneuver in the implementation of the study.

Statistical analysis

All collected data were organized, categorized, tabulated, entered and analyzed by using SPSS (Statistical Package for Social Sciences, version 14) which also yielded frequency tables and statistical significance. Statistical significance was assessed using the arithmetic mean, the standard deviation (SD), Pearson chi-square test (χ^2) and Pearson Correlation Coefficient (r) to determine the relationship between the variables. Significant difference was considered if $p \leq 0.05$.

Results

The study involved 30 nurses and 30 adult patients with acute severe asthma. All nurses in the study sample were female with age ranging between 21-45 years, and were married (86.7%) as seen in Table 1. Slightly more than half of them were diploma (56.7%) and had experience ranged between 1-27 years with a median of 12 years. Whereas, the experience in the Chest ICU and the Chest Department ranged between 1-27 years with a median of 9 years. All nurse participants reported not having previously training courses related to bronchial asthma.

Characteristics	No.	%
Age		
<30	18	60
≥ 30	12	40
Range	21.0-45.0	
Mean \pm SD	30.57 \pm 6.71	
Median	29	
Marital status		
Single	3	10
Married	26	86.7
Widow	1	3.3
Educational level		
Diploma	14	56.7
Nursing Institute	9	30
Baccalaureate of nursing	4	13.3
Years of experience in general nursing		
<10	12	40
≥ 10	18	60

Range	1.0-27.0	
Mean ± SD	12.20 ±7.11	
Median	12	
Years of experience in Chest ICU and unit		
<10	16	53.3
≥ 10	14	46.7
Range	1.0-27.0	
Mean ± SD.	10.17 ± 7.49	
Median	9	
Training course		
Yes	0	0
No	30	100

Table 1: Personal characteristics of nurses participants (n=30).

In terms of patients, Table 2 shows patients' ages ranged from 22-60 years with a mean of 46.87 years (SD ± 10.22). 76% of patients were female, 86.7% were married and living in rural areas while 60% were illiterate. Only 33.3% of the patients were employed and 83.3% reported not having enough income. Only 26.7% of them were smokers. Duration of asthma, about 93.3% of patients was more than ten years.

Characteristics of Studied Patients	No.	%
Age		
<30	2	6.7
≥ 30	28	93.3
Mean ± SD	46.87 ± 10.22	
(Range)	22-60	
Sex		
Male	7	23.3
Female	23	76.7
Marital status		
Single	3	10

Married	26	86.7
Divorced	1	3.3
Level of education		
Illiterate	18	60
Write & read	2	6.7
Primary	8	26.7
Secondary	1	3.3
High education	1	3.3
Occupation		
Employed	10	33.3
Unemployed, house wife	20	66.7
Residence		
Rural	26	86.7
Urban	4	13.3
Income		
Enough	5	16.7
Not enough	25	83.3
Smoking		
Yes	8	26.7
No	22	73.3
Duration of asthma		
<10	2	6.7
10+	28	93.3

Table 2: Distribution of personal characteristic of patient participants (n=30).

All the nurses had unsatisfactory level of knowledge and practice before implementation of the program; however, there is a statistically significant improvement in nurses knowledge and practice (P<0.001) after the program. It has been observed that there is a decreased (93.3%) "satisfactory" scores in the follow-up (Table 3).

Total nurse's knowledge regarding Overall knowledge	Pre		Post		Follow up		Pre/Post	Pre/FU
	No	%	No	%	No	%		
Satisfactory ≥ 75	0	0	30	100	30	100	<0.001*	<0.001*
Unsatisfactory<75	30	100	0	0	0	0		
Overall practice								
Satisfactory ≥ 75	0	0	30	100	28	93.3	<0.001*	<0.001*

Unsatisfactory<75	30	100	0	0	2	6.7		
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Table 3: Frequency and percentage distribution between pre, post and follow-up program phases according to overall knowledge and practice of nurses participants (n=30).

Table 4 demonstrates that patients in the study sample had statistically significant improvements in the severity of their asthma. Asthma attacks occurred less frequently, patients used oral cortisone less frequently and pulmonary function tests improved after the nurse's educational program was implemented. In the pre-program phase, 23.3% of patients had moderate asthma and 76.7% had severe asthma. In the post-phase, severe asthma decreased to 86.6% (p<0.001)*.

Asthma severity	Pre		Post		P
	No.	%	No.	%	
Frequency of attack					
Once time/week	0	0	0	0	MCN<0.001*
From 2-6 times/week	11	36.7	30	100	
Daily	19	63.3	0	0	
Oral cortisone use					
None	0	0	2	6.7	MH<0.001*
Sometimes with attack	5	16.7	12	40	
Always with attack	13	43.3	16	53.3	
Daily	0	0	16	53.3	
Pulmonary function test					
>80%	0	0	4	13.3	MH<0.001*
60-80%	8	26.7	26	86.7	
<60%	22	73.3	0	0	
Severity					
Mild	0	0	4	13.3	MH<0.001*
Moderate	7	23.3	25	83.3	
Sever	23	76.7	1	3.3	

Table 4: Changes in bronchial asthma severity among patient participants throughout program phases.

Table 5 illustrates the change in grades of asthma pre and post program phases. Percentage of patients with Grade III asthma went from 76.6% to 16.7% as a result of the program intervention. The percentage of patients with Grade IV asthma went from 20% to 3.3% as a result of the program intervention (p<0.001)*.

Grades	Pre		Post		P
	No	%	No	%	
Grade I	0	0	0	0	MH<0.001*
Grade II	0	0	24	80	

Grade III	23	76.7	5	16.7
Grade IV	6	20	1	3.3
Grade V	1	3.3	0	0

Table 5: Patients' breathlessness grades pre and post program phase.

Discussion

According to study findings, nurses' knowledge was generally low before implementation of program. The implementation of the program led to significant improvements in nurses' knowledge in all tested areas and this was retained throughout the follow-up. This indicates the effect of the program on nurses' knowledge, and this was further confirmed through multivariate analysis which identified the intervention as a significant independent positive predictor of improvement in nurses' knowledge. A similar success of an intervention in improving nurses' knowledge about bronchial asthma was demonstrated in a study in Egypt [15-17]. Thus, and in congruence with Sodhi et al. [18] recommended that education including knowledge and changing behavior is essential in treating patients with asthma.

The present study has also demonstrated major deficiency in nurses' practice of caring patient with acute severe bronchial asthma before implementation of program. This might be attributed to that these nurses may rely on their long experience years in their job, which extends to 27 years, thus their practice is based on experience rather than on knowledge and evidence.

Incongruence with these foregoing current study finding, Elmarakhy [19] in a study at Cairo University Hospital revealed that deficient practice among nurses who caring patient with bronchial asthma.

The nurses' practice after implementing program demonstrated significant amelioration and this extended throughout the follow-up. These findings reflect the positive effect of the intervention and this was again confirmed in the multivariate analysis which showed that the intervention as well as knowledge score was significant independent positive predictors of the practice score, and they explained together almost all the improvement in this score. Thus, the practical training element of the intervention, in addition to the theoretical part was effective in modulating nurses' practice. In agreement with this, Ibrahim [20] in a study at Cairo University Hospitals stressed that nurses should pay more attention to systemic evaluation of the patients, health education, and psychological guidance. In addition, the delivery of safe, evidence based care results in higher quality care of patients and better patient outcomes. Thus, new trends based on improving nurses' knowledge through nursing care standard could enhance their knowledge and consequently improve their practice.

The improvement of nurses' knowledge and practice would be futile if it does not lead to better patient care and outcomes. According to the

current study results, significant improvements were shown in decreased asthma severity and dyspnea grades compared with baseline. This is certainly a reflection of the amelioration of nurses' knowledge and practice. In fact, the multivariate analysis the intervention was the most influential positive predictor of the asthma severity and dyspnea grades. This is in line with This is in line with Guidelines From The National Asthma Education And Prevention Program which emphasized The quality of asthma care includes not only initial diagnosis and treatment to achieve asthma control, but also long-term, and regular follow-up to maintain control. Asthma control focuses on two domains. First, reducing impairment, the frequency, and intensity of symptoms and functional limitations currently or recently experienced by a patient. Second, reducing risk for future asthma attacks, progressive decrease in lung function and drug side effects (National, Heart, Lung, and Blood Institute) [21].

Moreover, after the implementation of the present study program, significant improvements were revealed in patients' severity of asthma and dyspnea grades. Regarding severity of asthma, the result of the study indicated that significant improvements in all these criteria (pulmonary Function tests, Frequency of attack, and oral use of cortisone). This confirms the importance of improving nurses' knowledge which will be reflected on practices and consequently on disease severity. This finding agrees with Linnehan [22]. Massachusetts University who found that nurses who are trained, provide education and instruct patients to improve asthma control and diminish severity of disease and also encourage being active participants.

It was observed that statistically significant improvement post program implementation also the data in the current study revealed that more than three quarters had dyspnea grade three before education. This might be due to the patients craving to learn and practice relieving strategies to overcome this over whelming problem that bother those patient. This finding in the line with Salah et al. [23]. Ain Shams University who's revealed that near half of the studied sample had dyspnea grade three before education which decreased significantly after education.

Conclusion and Recommendations

In conclusion, implementing nursing intervention program for care of patient with acute severe asthma is effective in inducing improvement in nurses' related knowledge and practice, which reflected to control asthma attack and reduce frequency, also decreased dyspnea grades for patient diagnosed with acute severe asthma. Therefore, it is recommended that this program be used in similar setting for confirmation of the results. Further research is proposed to investigate the effect of the implementation of this program decreasing hospitalization and complications of bronchial asthma.

References

1. Behera D, Sehgal IS (2015) Bronchial asthma - Issues for the developing world. *Indian J Med Res* 141: 380-382.
2. The World Health Organization (2012) Chronic Diseases and Health Promotion Department.
3. Lynn S, Kushtok K (2015) Understanding asthma pathophysiology, diagnosis and management. *Am Nurses Today* 10: 50-51.
4. Hammad MA, Alakhali KM, Hattan M, Noor DA, Sulaiman SA, et al (2016) Asthma in Saudia Arabia: Risk factors and pharmacotherapy. *Am J Pharm Res* 6: 6814-6821.
5. Toole KP (2013) Helping children gain asthma control: Bundled school-based intervention. *Continuing Nursing Education* 39: 115-124.
6. Shaaban H, AbdEl-Monem E, Wafy S, Mousa M (2012) Risk factors for childhood asthma: Which can be avoided? A case control study. *Egypt J Bronchol* 6: 25-36.
7. Mohamed N, Ali Z (2011) Effect of therapeutic guidelines for bronchial asthma on adult patients' knowledge, practice, compliance and disease severity. *Life Sci J* 8: 199-208.
8. Tarek S (2007) Towards a deep understanding of bronchial asthma Chest Department, Ain Shams University. *Egypt J Bronchol* 1: 120-124.
9. Ali A, Sallam MM, Fathy GA, Mhyeldin O, Awad SA, et al. (2010) Epidemiological study of the prevalence of bronchial asthma and other atopic diseases among school children in Egypt, Cairo. *Int J Acad Res* 2: 209-217.
10. Dewit S, Stromberg H, Dallred C (2016) Respiratory system in medical surgical nursing: Concepts and practice. Elsevier Co., USA.
11. Bare B, Smeltzer S (2012) Medical surgical nursing. 12th edn, A Wolters Kluwer Company, USA.
12. Manchana V, Mahal R (2013) Effectiveness of patient education on quality of asthma management among adult asthmatics: A cross sectional study. *Int J Sci Res* 4: 203-205.
13. Emery N, Vollmer W, Buist A, Osbrne M (1996) Self-reported food reactions and their associations with asthma. *J Nurs Res* 18: 643-654.
14. Global Initiative for Chronic Obstructive Lung Disease (2014) Global strategy for the diagnosis, management and preventing chronic obstructive pulmonary disease.
15. Black M (2009) Medical surgical nursing clinical management for positive outcomes. 8th edn, US, UK, Elsevier Inc.
16. Hassan A (2013) Developing nursing standard for patients with bronchial asthma. Assuit University, Unpublished Master Thesis, Egypt. Faculty of Nursing, Assuit University.
17. Ashery R (2014) Effect of implementing bronchial asthma guidelines on nurses performance. Unpublished Doctoral Thesis, Egypt, Faculty of Nursing, Mansoura University.
18. Sodhi R, Prasad R, Kushwaha R, Prakash V (2014) A study to know the knowledge, attitude and practices of patients of bronchial asthma. University of Delhi, India. *Int J Med Public Health* 3: 159-162.
19. Elmarakhy A (2012) Effect of diaphragmatic training on maximal inspiratory pressure and pulmonary gas exchange after coronary revascularization.
20. Ibrahim F A (2011) Impact of a designed nursing care protocol on the outcomes of patients with chronic obstructive pulmonary disease (COPD).
21. National, Heart, Lung and Blood Institute (2012) Asthma care quik reference diagnosis and managing asthma. Expert Panel Report.
22. Linnehan J (2013) Evidenced based asthma education intervention for adults in a primary care setting using self-management guidelines. Published Doctoral Thesis, Boston, College of Nursing, University of Massachusetts.
23. Salah M, Hamdi H, Shehta H (2013) Improving breathlessness and fatigue in patient with COPD. *J Am Sci* 9: 471-482.