



**The Effect of Asthma Educational Program on Self-Efficacy in Skill Management
of Asthma in Pekanbaru, Indonesia**

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Master of Nursing Science (International Program)**

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Thesis Title The Effect of Asthma Educational Program on Self-Efficacy in Skill
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Abstract

This quasi experimental, pre-post test study sought to evaluate the effect of an asthma educational program (AEP) on self-efficacy of individuals with asthma to manage their asthma. The purposive sampling was used to recruit 50 asthmatics admitted to a medical ward and receiving care in the pulmonary clinic of a general hospital in Pekanbaru, Indonesia. The experimental group (n=25), in addition to receiving routine care for their asthma, underwent two sessions of an AEP that covered mastery, vicarious experience, social persuasion and emotional state, as well as were provided an in-home asthma management guideline handbook. The control group (n=25) only received routine care for their asthma. Data were collected through use of two sets of researcher developed questionnaires that sought data regarding the subjects' demographics, health and self-efficacy. Inferential statistics, chi-square, t-test and paired t-test, were conducted to analyze the data.

Results shown the mean scores of total, as well as the subtotal scores, self-efficacy of the experimental group, after the AEP, were significantly higher ($p < .001$) than before the AEP. In addition, the mean scores of the self-efficacy of the experimental group were found to be significantly higher than the mean scores of the control group (preventing asthma symptoms $p < .01$; controlling asthma symptoms $p < .001$; inhaler technique $p < .05$). The findings suggest that an AEP that uses a teaching plan and a handbook to provide needed information should be provided regularly to asthmatics so as to increase their self-efficacy regarding management of their asthma.

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CHAPTER 1

INTRODUCTION

Background and Significance of the Problem

Asthma is an airway inflammation that leads to recurrent wheezing episodes, breathlessness, and chest tightness, coughing at night or in the early morning (GINA, 2008). Airway inflammation is part of the basic pathophysiology of asthma. It is caused by a variety of triggering stimuli that bring about partial or completely reversible blockage and narrowing of the airways (Schaffer, 2007). Patients with asthma are usually found to have a family history of allergies, such as eczema and allergic rhinitis (Smeltzer & Bare, 2004). The World Health Organization (WHO) has stated that 300 million people globally have asthma, and predict that the number of asthmatics will increase by approximately 100 million by 2025 (GINA, 2008). In Indonesia, asthma ranks seventh among the diseases that lead to death (Department of Health Republic Indonesia, 2003). In the Arifin Ahmad Hospital in 2007, 46.13% of the adult patients visiting the clinics for respiratory care were diagnosed asthma, and 4.55% of those died (Arifin Ahmad Hospital, 2007). The prevalence of asthma seems to be notably higher in the big cities of Medan, Jakarta, Palembang, Bandung, Semarang, Yogyakarta and Denpasar, compared with the more rural areas of the country (Waspada, 2008).

Air pollution is an environmental factor that can increase the incidence of asthmatic attacks. The impact of air pollution has on health is quite alarming, especially when it occurs close to human habitats. When humans are exposed to hazardous air, they are likely to develop signs and symptoms of upper respiratory infections. If the exposure is long term, chronic obstructive pulmonary disease and related heart conditions are likely to occurring (Sarnat & Holguin, 2007; Fadillah, 2008). In the province of Pekanbaru, air pollution occurs every year because of the burning of forest areas for the purpose of creating new planting areas for crops. This situation is still taking place, in spite of the Indonesian government forbids such practices. It causes respiratory problems in Pekanbaru people. In September, 2006, there were 12,036 cases of asthma were recorded due to air pollution that was caused by burning of forest (Department of Health, Republic Indonesia, 2006).

Signs and symptoms of asthma include dyspnea, a feeling of tightness in the chest, and wheezing (Fabbri, Boulet, Kardos & Vogelmeier, 2004). Dyspnea is a symptom that occurs in patients with asthma when a narrowing of the airways occur (bronchoconstriction). When dyspnea occurs, treatment is needed to resolve the problem. However, patients and family members often panic and become confused about what to do. Frequently, this is due to lack of knowledge about the illness (Chen et al., 2007). This lack of knowledge can include, but is not limited to, family members not understanding the relationship between air pollution and asthmatic attacks or not knowing how to use an inhaler correctly. If dyspnea cannot be adequately and rapidly resolved at home, a patient should take to the emergency room for treatment.

Prior research has shown that attending a self-efficacy educational program helps to improve the condition of those with asthma and other chronic obstructive pulmonary diseases conditions (Hanson, 1998; Kara & Turkinaz, 2004; Campbell, Lavoie, Bacon, Scharf, Abousafy, & Ditto, 2006; Davis et al., 2006; Ngamvitroj & Kang, 2007). An asthma educational program can offer asthmatics an opportunity to increase confidence in their ability to avoid asthma triggers, control symptoms and use inhalers to manage their asthma (Prabhakaran, Lim, Abisheganaden, Chee, & Choo, 2006). Patients who have higher self-efficacy are known to be more confident in managing their asthma (Ngamvitroj & Kang, 2007). In addition, they may be better able to prevent exacerbation of their asthma and obtain relief from asthmatic attacks through use of medication.

Several studies have showed that positive efficacy expectations and behaviour performance in asthma patients will improve after asthma patient attend an educational program (Gallefos, 2000; Prabhakaran, Lim, Abisheganaden, Chee, & Choo, 2006). The general aims of asthma educational programs are to help asthma patients integrate their ideas and beliefs about asthma with current knowledge and by providing more information (The National Asthma Council Australia, 2006). In asthma educational program patients are provided with information by care providers to help them maintain their life and come to terms with asthma.

Gallefoss (2000) concluded that an education program should reduce patients' visits to emergency departments and the number of days they take off work. Such programs appeared to increase the proportion of patients not reporting absenteeism from work during a 12 month follow up. In addition, Phipatanakul (2003) found that educational programs can improve the self management of asthma patients, improve lung functions and heighten feelings of self control.

Furthermore, education program that are considered part of routine care of asthma patient can also reduce the number of patients' disturbed nights (Daniel, Chow, Lai, Chan, Chang, & Yin So, 2006).

According to Bandura (1997), perceived self-efficacy is people's appraisal of their ability to perform effectively or competently in a designated situation. A strong sense of self-efficacy is necessary for a sense of personal well being and a capacity for persevering in making efforts to succeed. Those who have high self-efficacy (expectancy) have a higher internal locus of control than those who have lower self-efficacy (Campbell, Lavoie, Bacon, Scharf, Abousafy, & Ditto, 2006).

Self-efficacy is a key factor in asthma self management. It appears to have a strong influence on decision making, on the amount of effort made, and the persistence applied to performing behaviour (Wigal, Tobin, Winder, Holroyd & Creer, 1987; Wigal, Creer & Kostas, 1991). According to Hanson (1998), self-efficacy in asthma management is the person's belief that he or she can actually perform the behaviours and skills that are believed necessary to help them. Self-efficacy requires judgment to help to determine which activity to perform, for each situation a person faces, to manage their asthma.

Self-efficacy is influenced by the four sources identified by Bandura (1994). These are the experience of mastery, vicarious experience, social persuasion and the emotional state. Experience of mastery in a past successful performance is considered to be the most influential source of efficacy information. Vicarious experience is the process of seeking how others suffer in similar environments and to observe them in the performance of their management tasks. Social persuasion contributes to performance by motivating an individual to work harder to achieve success. The emotional state is the interpreting by the patient of their experience of tension, anxiety and depression as sign of personal deficiency.

Self-efficacy is needed to manage asthma by increasing the patients' level of skill management, and this helps them avoid exacerbating asthma attacks. An increasing level of self-efficacy will improve patients' confidence to carry out the behaviours necessary to successfully resolve their asthma problems. The helping patients to increase self-efficacy is relevant to people in Pekanbaru, Indonesia, where asthma is mainly caused by air pollution, the lack of confidence of asthma sufferers in managing their asthma by avoiding asthma triggers, using inhalers, and controlling asthma symptoms.

Arifin Ahmad Hospital, Pekanbaru, has an educational program run by the hospital's education and training department. However, the program has not been using teaching plans or handbooks to provide information for asthma patients. Information is not provided systematically and each patient gets different information. These problems may lead to low in the managing of asthma. With regards to this situation, the researcher is interested in providing an educational program to increase skill management of asthma patients before are discharged to enhance self-efficacy in skill management of asthma regarding their ability to avoiding asthma trigger, controlling asthma symptoms and inhaler technique. This will enable them to apply the skills learned to manage their asthma at home.

Objectives of the Study

1. To compare self-efficacy in skill management of asthma patients before and after attending the asthma educational program (AEP).
2. To compare self-efficacy in skill management of asthma between the asthma patients who attend AEP and those who receive routine care.

Research Questions

1. Is self-efficacy score in skill management of asthma in asthma patients after taking part in an AEP higher than before?
2. Is self-efficacy score in skill management of asthma in asthma patients who attend AEP higher than asthma patients who received routine care?

Conceptual Framework

An educational program is a systematic educational activity which is planned, organized and evaluated in terms of its effectiveness. An education program is delivered using various teaching methods, which promotes effective learning and behavior change. The asthma educational program in this study consists of: the basic respiratory physiology and medication ; risk factors; asthma triggers; signs and symptoms of asthma; demonstrating the use of inhalers; and promoting deep breathing. The various methods encourage participants' confidence in being involved in the teaching process. This might include, for instance: sharing experiences and brain

storming; discussions; demonstrations and practicing exercises; showing pictures relating to the increased self-efficacy of patients in managing their asthma; providing reinforcement to motivate the participant, and providing hand-books. These methods encourage participants to gain knowledge and management skills to improve their self-efficacy in managing their asthma (Robichaud, 2004). In addition, they have to know how to carry out an asthma plan correctly for the treatment of asthma. These methods help patients with asthma to be able to avoid asthma triggers, use inhalers correctly, and control their asthma symptoms (Shaughnessy et al., 2002; Ngamvitroj & Kang, 2007).

This study will apply Bandura's model of self-efficacy (1994). Self-efficacy is an important predictor for measuring outcomes of behaviour, and is a central concept in the application of social cognitive theory to health promotion. Self-efficacy is a person's belief in his or her capability to do activities to avoid or avoiding of disease. People can undertake decision-making in self-monitoring and adhering to recommendations relating to health (Hanson, 1998). Good self-efficacy may enable patients with asthma to avoid or control their vulnerability in certain situations that exacerbate their asthma (Mancuso, Peterson, M., & Charlson, 2001).

Bandura (1994) proposed that two types of expectancies will influence behaviour: efficacy expectancy and outcome expectancy. Efficacy expectancy is the conviction that one can successfully execute the behavior required to produce the outcome. Outcome expectancy refers to the conviction that certain behaviors will lead to certain outcomes. Self-efficacy is enhanced or influenced by four main sources. These are identified by Bandura (1994) as: experience of mastery, vicarious experiences (a social model), social persuasion, and emotional states when judging their capabilities.

Mastery experience is the most effective way to develop a strong sense of efficacy (Bandura, 1994). Mastery experience is integrated into the asthma educational program by providing handbooks as guidelines to exercises for patients. Patients can improve their confidence by attending asthma educational programs to get information about asthma. Sharing experiences, brain storming and discussing will make it easier for participant to improve their self-efficacy in avoiding asthma triggers and controlling asthma symptoms. Participants can share failure and succeed experience to manage their asthma. Demonstrations and exercises for practicing using

inhaler help patients to master them; this gives participants more confidence for the next time they use them.

Vicarious experience is when one observes other people as models in doing similar tasks. This process will provide inspiration and skills to succeed in the tasks at hand. Examples of modeling include using pictures to show: patients having asthma attacks; normal lung physiology; asthma pathophysiology; exercises that induce asthma; the correct use of inhalers; and deep breathing. These are demonstrated by using slides and LCDs. The researcher will demonstrate using inhalers with groups, and will provide handbooks as guidelines for participants

Social persuasion is the third mechanism that may enhance self-efficacy. Arising through social support and realistic encouragement, social persuasion contributes to performance by motivating an individual to work harder towards success in managing their asthma. In this method, participants will receive verbal and non verbal reinforcement from the researcher who will help them when they make mistakes when practicing. Handling will also be provided to make participants more confident in undertaking activities. This mechanism will influence self-efficacy through approval and encouragement from the caregiver, members of a group and health providers.

Furthermore emotional states affect patients when judging their capabilities, and thus affect expectations in relation to self-efficacy. Reaction to stress and tension make patients vulnerable to poor performance. A positive mood enhances perceived self-efficacy. The researcher can assess participants about their condition to make sure they have no dyspnea. The activity that will be provided to manage the emotional state by allowing the patients to express their feeling and concern as follow by relaxation technique by deep breathing that can reduce people's stress.

The goal of asthma educational program is to increase self-efficacy that is to make the sufferer confident that they can manage their asthma and asthma attacks when they exacerbations occur. The objectives of such a program are to increase mastery experience, increase vicarious experience, increase social persuasion and to improve the emotional state.

This means that the skills, attitudes, and experiences provided by an asthma program are used as the steps to achieve the aim or goal of the program. Thus the overall aim is to develop the self-efficacy of the patient in relation to controlling his or her asthma. The conceptual framework for this study is shown in Figure 1.

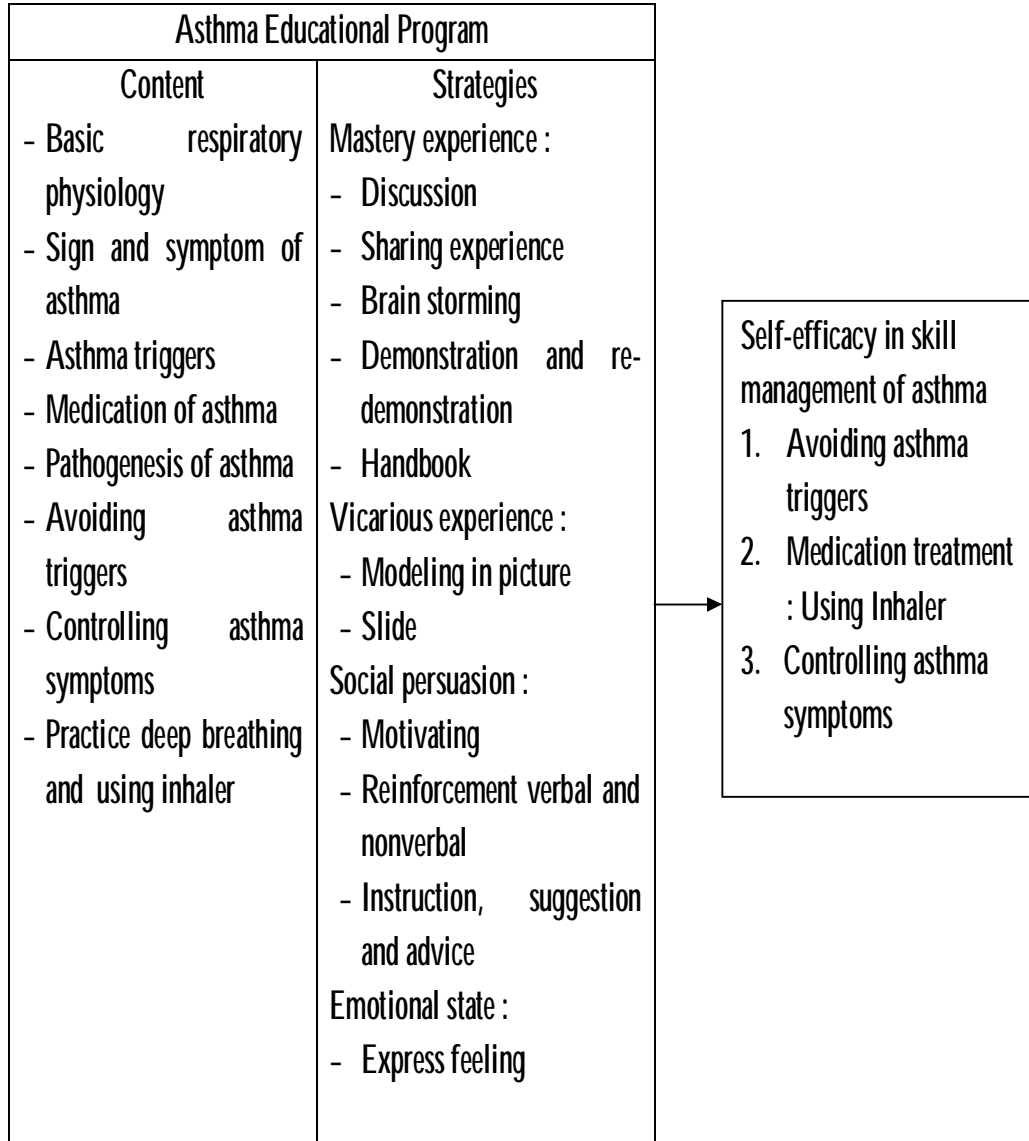


Figure 1: Conceptual framework for an asthma educational program

The asthma educational program is provided for admitted patients. During hospitalization, the researcher will invite them to join in asthma educational program to get information about asthma and to improve in skill management of asthma.

Hypothesis

1. Asthma patients who attended in an asthma educational program achieve higher self-efficacy score in skill management of asthma than before.
2. Asthma patients who attended in an asthma educational program achieve higher self-efficacy score in skill management of asthma than asthma patients who received routine care.

Definitions of Term

An asthma educational program is an educational package that contains an asthma health teaching plan to enhance self-efficacy in skills for the management of asthma. This will be done through the following mechanisms: mastery experience, vicarious experience, social persuasion and emotional state. Participants receive information to avoiding asthma trigger, the use of inhaler and how to control asthma symptoms.

Self-efficacy in skill management of asthma is asthma patients' perceptions of their ability to perform skill management in managing their asthma. Skill management refers to the ability to avoiding asthma triggers, controlling symptoms, and use medication treatment by using inhaler. Self-efficacy in skill management of asthma was assessed using questionnaire developed by researcher.

Significance of the Study

1. The outcomes of this study will improve knowledge and self-management skill for patients living with asthma.
2. The structured educational program can be used as guideline for nurse or other health professionals to teach patients to improve their self-management for asthma.
3. The research finding will provide information for future research according to concept of self-efficacy in asthma patients.

CHAPTER 2

LITERATURE REVIEW

This study aimed to explore the effect of asthma educational program in self-efficacy in skill management of asthma. This chapter will review previous research related to asthma as follows:

1. Asthma and Adult asthma Management
2. Concept of Self-efficacy
3. Measuring self-efficacy
4. Self-efficacy in asthma patients
5. Factors influencing self-efficacy in skill management of asthma
6. Asthma educational programs
7. The effects of asthma educational program on self-efficacy

1. Asthma and Adult Asthma Management

1.1. Definition

Asthma is characterized by airway obstruction (bronchoconstriction) that can increase mucus production, mucosal inflammation, edema and air flow obstruction (Holloway, 2004). It is a chronic illness involving the respiratory system in which the airway occasionally constricts, becomes inflamed, and is lined with excessive amounts of mucus, often in response to one or more triggers. Asthma can be categorized into four classifications: intermittent, mild persistent, moderate persistent and severe persistent (Mintz, 2004; GINA, 2008). Intermittent asthma triggers the symptoms of asthma occur one or twice, and nighttime symptoms occurs once or twice per month. The intermittent asthma shows the lung function of peak expiratory flow (PEF) or forced expiratory volume in 1 second (FEV1) approximately 80%. Mild persistent asthma triggers frequently the symptoms of asthma occur more than twice a week, but not more than once a day and night time the symptoms occur more than twice a month. The mild persistent indicates the lung function of PEF or FEV1 equal or more than 80%. Moderate persistent asthma triggers the symptom of asthma more than once per night with the lung function PEF or FEV1 ranging from

60% to 80%. Severe persistent asthma indicates the symptoms of asthma frequently at night with the lung function equal or less than 60% (Smeltzer & Bare, 2004).

1.2. Prevalence of asthma

In Indonesia, prevalence of asthma is predicted about 2 to 5 %. It is higher in infant and children than adults. Among children it is higher in male than females, and among adults it is higher in female than male. The prevalence of asthma is related with wheezing in Indonesia is 2.1% with school children aged from 13 to 14 were suffering from asthma in 1995. This number increased up to 5.2 % in 2003. The result of survey in Medan, Palembang, Jakarta, Bandung, Malang and Denpasar showed that asthma the prevalence of asthma is increased in school children aged from 6 to 12 years. The prevalence of asthma had increased from 3.7 % to 6.4 % from 1995 to 2003 (Memes, 2007).

Signs and symptoms of asthma are bronchoconstriction, inflammation and production of much secretion (Siswono, 2007). According to data from WHO, worldwide 300 million people are suffering from asthma and by 2025; this number will reach 400 million. This number can be increase more because of poor air quality, and poor of control (Faisal, 2007). In 2005, the prevalence of asthma in Childhood had increased, from 4.2 to 5.4 %. According to data of WHO, that in 2005, 225 thousand people died due to asthma.

1.3. Predisposing factors

1.3.1. Hereditary

Individuals with a family history of asthma are more commonly found among asthma patients (Ngamvitroj & Kang, 2007).

1.3.2. Allergy

Allergy is the most important predisposing factor in asthma. Indoor allergen may cause asthma attacks. It is reflected in the tendency to produce abnormally high levels of immunoglobulin E (IgE) in response to the exposures of substances in the environment (Brinke et al, 2005).

1.4. Risk factors of asthma

A marked prevalence of asthma occurred in 1960 and up to now it has been increasing. Prevalence of asthma is higher in urban communities compared with rural communities (Global Initiative for Asthma [GINA], 2004). Triggers cause an asthma episode to occur, to become worse, and to make breathing difficult (The lung association, 2008). Several proven and common risk factors of asthma are as follows:

1.4.1. Diet

Diet is a major source of allergen exposures of asthma people (Crapo, Lassroth, Karlinsky, & King, 2004). Foods can trigger asthma because of allergies such as peanuts, nuts, sesame, fish, shellfish, dairy products, and eggs. Some people become wheezy when they have food containing certain additives, such as tartrazine, benzoates acid, and some histamine food (Fadillah, 2008).

1.4.2. Obesity

Obese adults frequently encounter severe or persistent asthma (Rauscher, 2007). Obesity leads people altering lung volume, which lead rapid and shallow breathing patterns. Obesity also causes reduction of peripheral airway diameter (middle), which can lead to increased airway hyper responsiveness (Beuther, Weiss, & Sutherl, 2006).

1.4.3. Infection

Infectious diseases can affect on immune system development when people expose viral, bacterial, and parasitic infection. Respiratory tract infection may cause asthma. Infectious diseases from microbial agents, clamidia and mycoplasma are potential contributing which may lead to exacerbation or chronic asthma (Griswold, 2005; Lemaske, 2003; Nicholson, Kent & Ireland, 1993).

1.4.4. Smoking

Tobacco smoke damages tiny hair-like projections in the airways, and cilia by making it unable to protect body from allergens. Cigarette smoke also causes the lungs to produce infectious mucus. It results in airway obstruction. Adult smokers tend to develop respiratory illnesses. Passive smoking can lead to decrease lung functionality and to increase the symptoms of airway inflammations, such as cough, wheeze, and increased mucus production (Sarnat & Holguin, 2007; Stewart & Sales, 2000).

1.4.5. Air pollution

Outdoor air pollution associates with the increased hospitalization or visit of emergency department for asthma, school and work absenteeism. Outdoor air pollution also increases asthma mortality (Sarnat & Holguin, 2007). Environmental pollution stimulates asthma exacerbation, especially in big cities and area burn forest. It can increase the risk of asthma attack and readmission of hospitalization during burning forest (Arbex et al., 2007).

1.4.6. Changes in weather

A sudden change in temperature can trigger asthma attack, such as cold air, windy days, poor air quality and hot, humid days (Josep, 2007).

1.4.7. Exercise

Exercise-induced asthma occurs when the airways narrow as a result of exercise (Henneberger, Hoffman, Magid & Lyons, 2002). Exercise-induced symptoms occur commonly and intensively when the inhaled air is cold, relatively cool, dry air probably due to air changes during vigorous activities. Typical symptoms of asthma present, such as shortness of breath, chest tightness, and cough (O'byrne, 2008).

Exercise can be a trigger for people when their asthma is not under good control but it does not mean that people with asthma should avoid exercising. As long as their asthma is under control, exercising is recommended to keep the lungs and body in good shape. Exercise by patients when their asthma under control will strengthen breathing muscles, increase the immune system and keep a healthy body weight. Swimming is one of the best forms of exercise for people with asthma because it usually causes the least amount of chest tightness (Fanta & Flechter, 2008).

1.4.8. Stress

Physiologic stress can cause wheeze and asthma in bad condition (Crapo, Lassroth, Karlinsky, & King, 2004). Stress is a common asthma trigger. Stress and anxiety sometimes make short breath and cause symptoms of asthma worse. Stress start to creep upward-weather it's over bills, work. When people with asthma have wheezing and coughing worse, they feel worried. Asthma, stress, and anxiety make a vicious circle and spiral downward quickly.

1.5. Symptoms of asthma

According to Black & Hokanson (2005), common symptoms of asthma are as follows:

1. Coughing: coughing is often worse at night or early morning, making it hard to sleep for people with asthma
2. Wheezing: wheezing is a whistling or squeaky sound because of unclear breath.
3. Chest tightness: this is a feeling of something is squeezing or sitting on the chest.
4. Short breathing: some asthmatic people face breathing problems because of ineffective breath in and out.
5. Rapid breathing: it is a common asthma symptom. When breathlessness occurs in asthma patients, they will try breathing faster to inhale air in and to exhale to out of the lungs as much as they can.

1.6. Pathogenesis

Asthma occurs when the main air passages of the lungs, the bronchial tubes, become inflamed, the muscles of the bronchial walls tighten, and the cells in the lungs produce extra mucus, which further narrows the airway. This can cause minor to severe wheezing and difficulty in breathing. In some cases, breathing may become so labored that an asthma attack becomes life-threatening. However, asthma can be managed to reduce the severity and frequency of exacerbation of the illness. As a result the afflicted individual can live a normal and active life (Williams & Hopper, 2003).

The airways of individuals with asthma are extremely sensitive to allergens and irritants that caused by the environment. When allergens or irritants are present, the lining of the airways become inflamed, swelled and subsequently, narrowed (Holgate, 2006). Asthma attacks are brought about by allergens which are a result of an antigen/antibody reaction by mast cells in the respiratory tract. This reaction causes the release of inflammatory mediators from mast cells, which elicits the clinical response associated with an asthma attack (Goldstein, Paul, Metcalfe, Busse, & Reece, 1994). When the airway lining becomes inflamed, an increase in mucus production takes place causing clogging of the airways and further blockage, so that air flow is impeded. The clogging of airways causes coughing, chest tightness, wheezing and hypersensitiveness of bronchus. Wheezing occurs when expiration. The mucus production reduces movement of cilia. It

result in long term inflammation and damages the structure and epithel function of cilia. The severity of asthma occurs depend on airflow and patient feel dyspnea (Hidenobu, 2007).

1.7. Medication

There are two kinds of medication for asthma management including control and relieve asthma medications (GINA, 2008). The control asthma medications are to keep asthma under clinical control chiefly through their anti-inflammatory effects. The medications can be taken daily on a long-term. The control asthma medications include inhaled and systemic glucocorticosteroids, leukotriene modifiers, and long-acting inhaled β_2 -agonists in combination with inhaled glucocorticosteroids, sustained-release theophylline, cromones, anti-IgE, and other systemic steroid-sparing.

Relief an asthma medication is used for quick relief of asthma attack and for relieves the symptoms of constricted bronchial tube by relaxing the muscles of the airways. Rescue asthma medications treat acute symptoms, such as coughing, swelling, wheezing, mucus production, short breathing, rapid breathing, and chest tightness. The medications used on an as needed. The relieve asthma medication include rapid-acting inhaled β_2 -agonists, inhaled anticholinergics, short-acting theophylline, and short-acting oral β_2 -agonists (Dilley, Pizacani, Macdonald, & Bardin, 2005; GINA, 2008).

The medication for asthma adult can be administered by inhaled, orally, and parentally by subcutaneous, intramuscular, or intravenous injection.

1.7.1. Controller Medications

1.7.1.1. Inhaled glucocorticosteroid

Inhaled glucocorticosteroids are the most effective anti-inflammatory to treat asthma persistent. This drug can reduce hyper responsiveness of the airway, controlling airway inflammation, reducing frequency and severity of exacerbation and asthma mortality.

Local side effect of inhaled glucocorticosteroids is oropharyngeal candidacies, dysphonia, occasionally coughing from upper airway irritation. This problem also associated to device spacer. Mouth washing (gargling, rinsing with water, and spitting out) after inhalation can reduce oral candidacies.

1.7.1.2. Leukotriene modifiers

Leukotriene modifiers are used to reduce airway inflammation, and asthma exacerbation. These drugs may be used as alternative treatment for adults with mild persistent asthma and some patient's aspirin-sensitive respond well.

The side effect of Leukotriene modifiers is associated to liver toxicity and Churg-Strauss syndrome.

1.7.1.3. Long-acting inhaled β 2-agonist

Long-acting Inhaled β 2-agonist (Formeterol and Salmeterol) are most effective when combined with inhaled glucocorticosteroids. Formeterol and Salmeterol are suitable for symptoms relief. The greater efficacy of combination treatment can be used for rescue and maintenance.

1.7.1.4. Theophylline

Theophylline is bronchodilator. This drug can be used for persistently symptomatic asthma, especially to prevent night time asthma. Theophyllines can maintenance the constant level of blood stream to be effective.

The side effect of Theophylline includes gastrointestinal symptoms, loose stools, cardiac arrhythmias, seizures, and even death.

1.7.1.5. Cromones: Sodium cromoglycate and Nedocromil sodium

Cromones is one of anti-inflammatories, which inhibit the release of histamine/leukotrienes and chemoattraction of leukocytes. Cromones also reduces C-fiber nerves with decreasing bronchoconstriction and prevents cough. Cromones are used as a prophylaxis against exercise-induced and allergen-induced asthma and very safe for using. The side effects are uncommon and including cough and sore throat.

1.7.1.6. Long-acting oral β 2-agonist

Long-acting oral β 2-agonist (Salbutamol, Turbutaline, and Bambuterol) are used as bronchodilator. The side effects of this drug include tachycardia, anxiety, and skeletal muscle tremor.

1.7.1.7. Anti-IgE

Anti-IgE is a treatment option limited to patients with elevated serum level of IgE. Anti-IgE appears to be safe as add on therapy for patients age 12 and older who received glucocorticosteroids (oral and inhaled), and long-acting β 2-agonist

1.7.1.8. Systemic glucocorticosteroids

Systemic glucocorticosteroids are long term oral therapy glucocorticosteroids for several uncontrolled asthma but its use is limited by the risk of significant adverse effects. The side effect of systemic glucocorticosteroid include osteoporosis, arterial hypertension, diabetes, hypothalamic-pituitary-adrenal axis suppression, obesity, cataract, glaucoma, skin thinning leading to coetaneous striae, and easy bruising, and muscle weakness.

1.7.1.9. Oral anti-allergic compounds

Oral anti-allergic compounds include tranilast, repirinast, tazanolast, pemiorlast, ozagrel, celatrodast, amlexanox, and ibudilast. This drug can be used long term treatment of asthma.

1.7.2. Reliever Medications

1.7.2.1. Rapid-acting inhaled β 2-agonist

Rapid-acting Inhaled β 2-agonists (salbutamol, terbutaline, fenoterol, levalbuterol HFA, reproterol, and pirbuterol) are the medication for relief of bronchospasm during acute exacerbation of asthma and for the pretreatment of exercise-induced bronchoconstriction. The side effects in consuming this medication include tremor, and tachycardia.

1.7.2.2. Systemic glucocorticosteroids

Systemic glucocorticosteroid is important in treatment of severe acute exacerbation. This medication can prevent progression of the asthma exacerbation, prevent early relapse after emergency treatment and reduce morbidity of the illness. The side effect of systemic glucocorticosteroid include reversible abnormality in glucose metabolism, increased appetite, fluid retention, weight gain, rounding of the face, mood alteration, hypertension, peptic ulcer, aseptic necrosis in the femur.

1.7.2.3. Anticholinergics

Anti cholinergic is used to improving lung function and reduces the risk of hospital admission. The side effects of this medication include dryness of the mouth and a bitter taste.

1.7.2.4. Theophylline

Theophylline is used to relief asthma symptoms. Theophylline should not administer for patients with long term treatment.

1.7.2.5. Short-acting oral B2-agonist

Short-acting oral B2-agonists are appropriate for use in patients who are unable to use inhaled medication.

1.8. Asthma management

Most of the adults with asthma require ongoing and regular management to prevent asthma exacerbation. The aim of asthma management is to realize symptoms, getting normal life, and preventing development of permanent lung damage and abnormal lung function, prevent asthma mortality, prevent asthma exacerbation and avoid adverse effects from asthma medications (GINA, 2008; Powel & Gibson, 2008). The management of asthma patients consists of the following activities:

1.8.1. Develop patients/doctor partnership

The effective management of asthma requires developing relationship between patients, caregiver, and health provider. This relationship is built to increase asthma patient ability to control their condition with guide from health care professionals. The partnership is formed and strengthened as patients and their health care providers discuss and agree on the goal of treatment, develop a personalized, write self-management plan include self-monitoring, and level of asthma control. Educational program should be an integral part of all interaction between patients, health care professional to maximize self-management of asthma (Netina, 2006; GINA, 2008). Additional asthma action plan also can help patient to change their treatment in response to change the level of asthma control as guideline them to record the asthma symptom and measure peak expiratory flow.

1.8.2. Identify and reduce exposure to risk factors

Pharmacologic interventions to treat asthma are effective in controlling symptoms and improve the quality of life asthma patients. However, measures to prevent development of asthma, asthma symptoms and asthma exacerbation by avoiding, rising contact to risk factors should be implemented everywhere possible. Asthma exacerbation can be caused by a kind of risk factors including allergens, viral infection pollutants, and drugs (Henneberger, Hoffman, Magid & Lyons, 2002; GINA, 2008). The other hand emotions, such as excitement, fear or anger (Katon, Richardson, & Lozano, 2004), irritants, such as air pollution and smoking (Damia, Fabregas, Tordera, & Torero, 2004), changes in the weather (e.g. a cold spell) and food allergens, such as peanuts (sensitized or allergic children can have a very severe allergic reaction), and rarely, food additives such as tartrazine (an artificial food coloring) may also act as triggers (Smeltzer & Bare, 2004). By avoiding these triggering factors can prevent asthma triggers. Reducing exposure to risk factors can improve the control of asthma and can reduce using medication. The early identification of occupational sensitizers and removal of sensitizers is importance aspect for patient to manage asthma.

1.8.3. Assess, treat, and monitor asthma

The aim of asthma management is to achieve and maintain asthma patient's condition by build relationship between patient, caregiver and health provider. Each patient has to assess about the regiment treatment and level of asthma control in standard controlled, partly controlled, or uncontrolled. If the patients uncontrolled, the treatment have to stop until control is achieved. If asthma was controlled, the treatment can be stepped or started from the lowest dose to maintain the asthma.

Asthma patients can consume most of medication. They can consume medication follow the steps for control their asthma. Step 1 (rapid acting-inhaled β_2 -agonist included Salbutamol, Terbutaline, Fenoterol, Levalbuterol HFA, Reproterol, and Pirbuterol) treatment used reliever medication to treat irregular daytime symptoms (cough, wheezing, dyspnea, nocturnal). If the symptoms more frequent, asthma patients can continue to step 2 (low dose inhaled glucocorticosteroid e.g. 100-200 μg budesonide daily) and alternative medication is recommended to use leukotrine modifier. Step 3 (reliever medication plus one or two controller medication) was used to rescue and maintenance asthma such as combination inhaler formoterol and budesonide.

This medication can reduce exacerbation. Step 4 include reliever medication plus two or more controller medication. Step 4 is combined between medium and high dose of inhaled glucocorticosteroid (400 µg budesonide daily) and long acting inhaled β_2 -agonist such as salmeterol, fluticasone, foradil aerolizer, and symbicort. Step 5 includes reliever medication plus additional controller medication options included acupuncture, homeopathy, herbal medicine, Ayurvedic medicine, ionizers, osteopathy, chiropractic manipulation, speleotherapy, and supplements. At each treatment step, reliever medication should be provided for quick relief of symptoms as needed. Patients should ask to health provider about potential side effect and all other alternative treatment must be considered (GINA, 2008).

Continue monitoring is essential to maintenance asthma control and to establish the lowest step and dose of treatment to minimize cost and maximize safety for patients. Asthma medication can treat symptoms and causes of asthma. Corticosteroid and bronchodilator are effective for asthma inhaler medication. Most of the people with asthma have to know the use inhaler and they have to improve their skill to use it correctly (Bracken et al., 2003).

Asthma sufferers have to learn to use inhalers. The following instructions for using an inhaler and spacer are based on Togger and Brenner (2001); and Nettina (2006).

Using Inhalers

1. The sufferer should make sure that the medication canister is attached to the plastic inhaler and shake well or, if using a dry powder inhaler system (DPI), load the medication disk according to the manufactures instruction.
2. If recommended, a spacer should be attached to the metered dosed inhaler (MDI).
3. The patient has to breath out through the mouth while sitting upright or standing
4. If a spacer is not used, the open mouth method is better with an MDI. The following instructions are normally given :
 - 4.1. Hold the inhaler up to 2 inches away from your open mouth
 - 4.2. While starting to inhale through your open mouth, use your index finger to press down firmly on the top of the canister.
 - 4.3. Continue to inhale for 3 to 5 seconds to obtain a full breath, and then try to hold your breath for 5 to 10 seconds.

5. If the closed mouth method is used (as recommended for DPI systems) the following instructions are given:
 - 5.1. Place the mouthpiece of the inhaler in your mouth and close the lips tightly around it.
 - 5.2. While starting to inhale, use your index finger to press down firmly on the top of the canister.
 - 5.3. Continue to inhale for 3 to 5 seconds to obtain a full breath, and then hold your breath for 5 to 10 seconds.
 - 5.4. Remove the inhaler from your mouth before you exhale and breathe normally.
6. If more than one inhalation is prescribed, the patient is told to wait at least 30 seconds before taking another inhalation, then to repeat step 1 to 5.
7. The mouthpiece cap should be replaced after each use.
8. Patients are told to clean the inhaler thoroughly and frequently. The metal canister has to be removed and the inhaler and cap should be cleaned at least once per day by rinsing with warm, running water. The inhaler should be dried and capped thoroughly with a gentle twisting motion.
9. The canister must be discarded after the number of inhalations indicated has been taken. It should not be used beyond this indicated number because the correct dose amount can no longer be guaranteed.
10. For dry powdered inhalers, forceful, rapid inhalation should be used with a closed mouth technique. Patients must read the instructions provided by the manufacturer of the used device.

Using Spacers

The following instructions are given to patients.

1. The inhaler must be attached to the spacer or holding chamber as shown in the product instruction.
2. Shake it well.
3. Press the canister on the inhaler, which will put one puff of medicine into the holding chamber.
4. Place the mouthpiece of the spacer into your mouth and inhale slowly.
5. Hold your breath a few seconds, and then exhale.

6. If you're health care provider has prescribed two or more puffs, wait 1 minute and repeat steps 4 to 6.

1.8.4. Manage asthma exacerbations

Exacerbations of asthma are episodes of progressive increase in shortness of breath, cough, wheezing, or chest tightness, or some combination of the asthma symptoms. Exacerbations are characterized by measurement of lung function to measure expiratory flow. Severe exacerbation are potentially life threatening and treatment under observation in acute care facility to monitor airflow obstruction, oxygen saturation, and cardiac function is possible. The aims of treatments are to relief airway obstruction, hypoxia as quickly as possible and to prevent relapses in the future.

1.8.5. Special consideration

Patients asthma with pregnancy, rhinitis, and sinusitis, surgery, respiratory infections, nasal polyps, gastrointestinal reflux, aspirin-induce asthma, anaphylaxis, and geriatric people are need special consideration to manage their asthma. During pregnancy, the severities of asthma often change, they need to close follow up their condition and need to adjust the medication.

The important triggers of asthma in elderly age are respiratory infection that commonly caused by virus, reflux, and medication for other disease such as pulmonary diseases and myocardial infarction. Management asthma due to elderly should modify according to physiologic, physiological and psychosocial change. Non-pharmacological management is important including stop smoking, encourage appropriate exercise, educational program and the appropriate to use inhaled medication.

Exercise deep Breathing

The principle purpose of deep breathing is to control hyperventilation (British Thoracic Society, 2008). The aim of deep breathing for asthma patients is to increase flexibility of chest wall and to relax breathing muscle (Lucas & Thomas, 2005). Deep breathing exercise can perform every day to integrate natural breathing. When patients breathe fully and deeply, the diaphragm moves farther down into the abdomen and the lungs are able to expand more completely into the chest cavity. This means that more oxygen is taken in and more carbon dioxide is released

with each breath. Deep breathing takes advantage of the fact that the lungs are larger toward the bottom than the top.

There are several steps to perform deep breathing.

1. Lie down or sit in a comfortable chair, by maintaining good posture. Your body should be as relaxed as possible. Close your eyes. Scan your body for tension.
2. Pay attention to your breathing. Place one hand on the part of your chest or abdomen that seems to rise and fall the most with each breath. If this spot is in your chest you are not utilizing the lower part of your lungs.
3. Place both hands on your abdomen and follow your breathing, noticing how your abdomen rises and falls.
4. Breathe through your nose.
5. Notice if your chest is moving in harmony with your abdomen.
6. Now place one hand on your abdomen and one on your chest.
7. Inhale deeply and slowly through your nose into your abdomen. You should feel your abdomen rise with this inhalation and your chest should move only a little.
8. Exhale through your mouth, keeping your mouth, tongue, and jaw relaxed.
9. Relax as you focus on the sound and feeling of long, slow, deep breaths.

2. Concept of Self-Efficacy

Bandura (1994) defined self-efficacy as a belief in one's own capabilities to organize and to execute the course of action required for attaining goal. It determines how someone feels, thinks, and behaves. Self-efficacy makes people feel better, and have more power to control what may happen to them. People with self-efficacy showed greater interest, and are more involved in activities that help them to manage their condition. They can set goals and keep them with commitment and they also do not give up when they make mistakes. If asthmatics believe in this way they overcome challenges and their own weaknesses, and have the confidence to eventually control their asthma (Wigal, Creer & Kotses, 1991; Pajares, 2007).

It is believed that self-efficacy can help people actually perform the behavior and skills that they need to help themselves (Hanson, 1998). Kara and Turkinaz (2004) averred that self-efficacy is the patient's confidence in their ability to manage or avoid their problem and this may

have significant clinical implications. Campbell, Lavoie, Bacon, Scharf, Abousafy, & Ditto (2006) stated that self-efficacy may be defined as having confidence in one's ability to successfully engage in behavior that will yield a positive outcome. Self-efficacy is people's perception of their own capabilities that can affect their motivation, coping behavior and ability to practice certain behaviors. Davis et al (2006) and Ngamvitroj and Kang (2007) defined self-efficacy as having the strength to influence one's personal decision making through self-monitoring behavior and thus enhancing adherence to health recommendations.

The basic premise underlying self-efficacy theory, according to Bandura (1997), is that efficacy involves expectations and expected outcomes. An efficacy expectation is concerned with confidence in one's capability to produce certain expected behavior. People are motivated to perform behaviors that they believe will produce desired outcomes. This involves outcome expectations and these are highly dependent. An outcome expectation is a person's belief about the outcome that will result from a given behavior. These outcomes can take the form of physical, social or self-evaluative effects.

2.1. Sources of self-efficacy

According to Bandura (1994), there are four key sources of self-efficacy. They are as follows:

2.1.1. Experiences of Mastery.

Experience of mastery is the most important source of a person's self-efficacy. A patient's experience can build self-efficacy. Such experience provides the most reliable evidence in personal development that shows that they can gain from successful experiences. They can use experiences of mastery to build a healthy belief in their personal efficacy. People who are confident about their capabilities are more likely to look at situational factors, insufficient effort, or poor strategies as the causes of difficulties. When they ascribe poor performance to faulty strategies, rather than inability, failure can bring confidence that better strategies will bring future successes. Failures that are overcome by determined effort can instill robust perception of self-efficacy; through such experience one can eventually master handling even the most difficult obstacles.

2.1.2. Vicarious Experiences

Vicarious, such as secondary or imaginary, experiences are generally weaker than direct ones. People can increase their self-efficacy by seeing or visualizing, hearing other people similar to them performs successfully. This can raise self-efficacy in observers; they feel that they too possess the capabilities to master comparable activities. They persuade that if others can do it, they will also be able to achieve at least some improvement in their own performance. By the same token, they may see others of similar competence fail, despite their high efforts. This lowers an observers' confidence in their own capabilities, and this undermines their efforts. Role-modeling provides people with ideas about how they can perform certain tasks, and breeds confidence in them so that they can act in a similarly successful manner.

2.1.3. Social/Verbal Persuasion

Social persuasion is a third way to strengthen patients' belief. Social persuasion builds self-efficacy, when people respect patients and praise them for their competences and abilities, patients feel more confident, and this improves their effectiveness. Through receiving instructions, suggestions and advice, patients succeed in difficult tasks. Positive feedbacks can also raise self-efficacy. Regardless of its source, social persuasion is likely to increase self-efficacy when it is perceived as credible. It also helps if it emphasizes on how to succeed by devoting sufficient efforts to mastering acquirable skills, rather than stressing on inherent talents. Persuasion boosts self-efficacy and leads people to try harder to succeed; it also promotes the development of skills and a sense of personal efficacy. Persuasion as a factor in fostering efficacy has greatest impact on people who have some reason to believe that they can produce effects through their actions.

2.1.4. Emotional States

Information about the human body can influence a person's estimation of his or her capability of showing a specific behavior. Stressful reactions and tension indicate that people performing poorly. People with positive moods increase their self-efficacy. People often show adverse physical signs in stressful situations as vulnerability develop dysfunctions. Because high arousal can benefit performance, people are inclined to expect success. On the other hand, when the arousals are unfavorable they become tense and agitated.

2.2. Process of Self-efficacy

Self-efficacy is defined as people's beliefs about their capabilities to produce designated levels of performance. The effects of designated performances over events influences people' self-efficacy, and that affects their lives. Bandura (1994) describes four psychological processes that have an effect on daily functions. They are cognitive processes, motivational processes, affective processes and selection processes.

2.2.1. Cognitive process. The effect of self efficacy on cognitive process takes a variety of forms. A behavior can control by thinking before setting a goal. Setting the goal will be influenced by perceptions about the abilities to reach the goals

2.2.2. Motivational process. Motivation is a process to produce confidence in outcomes, and provide direction and maintenance behavior to reach the goal. People with it seek self-satisfaction from fulfilling valued goals and are prompted to intensify their efforts by being discontented with substandard performances

2.2.3. Affective process. People's beliefs in their coping capabilities relate to stress and depression. Their experience in threatening or difficult situations can influence their motivation. Perceived self-efficacy will manage negative and positive attitudes. If people believe they can control their ability to cope it will affect their emotional states and help them make good decisions.

2.2.4. Selection process. A selection process is needed to provide the information to enhance self efficacy. Self beliefs of personal efficacy are influenced by the types of activities and environments people select. People avoid activities and situations that they believe will exceed their capabilities to cope

3. Measuring self-efficacy

According to Bandura, there are no standardized instruments for measuring self-efficacy because self-efficacy is a specific domain (Bandura, 1997). Bandura suggests that measuring self-efficacy should be relatively specific and focused on tasks. He also claimed that the measurements of particular self-efficacy need a greater power to predict behaviors than the measurement of general self-efficacy.

There are many existing tools to measure asthma self-efficacy including Knowledge, Attitude, Self-Efficacy-Asthma Questionnaire(KASE-AQ)(Wigal et al, 1993), Asthma Self-

Efficacy Score (ASES) (Tobin et al., 1987), Self-Efficacy Measurement (ASM) (Martin et al., 2009), Self-Efficacy for Asthma Management Scale (SEAMS) (Berg, Jacob, & Sereika, 1997).

Self-Efficacy-Asthma Questionnaire (KASE-AQ) was developed by Wigal et al., (1993). The KASE-AQ consists of 60 items questionnaires with three subscales of knowledge, attitude and self-efficacy. Each subscale contains 20 items. The self-efficacy questionnaire to measure self-efficacy regarding patients perceived ability to control the disorder. Items for self-efficacy have a 5 point response format resulting in the range score from 20 to 100. Each item is scored from 1 to 5 in terms of "true" to "false". This instrument has internal consistency reliability with Chronbach's alpha coefficient 0.89.

Asthma Self-Efficacy Score (ASES) developed by Tobin, Wigal, Winder, Holroyd, & Creer, (1987) to assess asthmatic's confidence in ability to success fully control or avoid an asthma attack in a variety of context including while performing different activities. The ASES consist of 80 items. The ASES is rated on a five scale from "no confidence" to very confidence and yield score from 0 to 320, with high score denoting better asthma self-efficacy. This questionnaire has very high internal consistency, with an alpha of 0.97. This questionnaire has good test-retest reliability, with a correlation of 0.77.

Self-Efficacy Measurement (ASM) was developed by Martin et al., (2009) to measure patient's perceived ability to incorporate several strategies to successfully deal with general problems in life. ASM consist of 21 items with 5 underlying dimension of asthma self-efficacy: managing acute attacks (6 items), asthma control (5 items), emotional and environment (4 items), doctor relationship (4 items), and regular control medicine use (1 item). The total self-efficacy score was calculated averaging the score for the 5 dimension. This questionnaire has strong internal validity, with reliability coefficient from 0.77 to 0.84.

Self-Efficacy for Asthma Management Scale (SEAMS) was developed by Berg, Jacob, & Sereika, (1997) to measure self-efficacy with inhaled medications. SEAMS consist of 14 items self-efficacy for asthma management scale. The range of possible score was 0 to 100 with high score suggesting high self-efficacy. Test-retest reliability was 0.82 at 2 weeks with sample 30. This questionnaire has internal validity ranged from 0.90 to 0.82.

In summary, it can conclude that all of the questionnaires were inappropriate for this study because they developed based on perceived ability of patients is associated with self-

management behavior. The items of instruments were also not covered to measure self-efficacy in skill management of asthma (avoiding asthma triggers, controlling asthma symptoms, and using inhaler). Following this reason the researcher developed a questionnaire to measure asthma self-efficacy expectations.

4. Self - Efficacy in asthma patients

Bandura (1994) found that an individual's self-efficacy plays a major role in how goals, tasks, and challenges are approached. People with a strong sense of self-efficacy view challenging problems as tasks to be mastered. They can develop deeper interest in the activities in which they participate and form a stronger sense of commitment to their interests and activities. They recover quickly from setbacks and disappointments. On the other hand people with a weak sense of self-efficacy avoid challenging tasks and believe that difficult tasks and situations are beyond their capabilities. They only focus on personal failures and negative outcomes and they quickly lose confidence in their personal abilities.

Asthma and asthma knowledge can promote adherence to medication regimens (Ngamvitroj & Kang, 2007). For this study, it included sharing experience, discussing and brainstorming about how to manage the asthma, showing the picture related to manage the asthma, demonstrating how to use inhaler and deep breathing, applying reinforcement, and giving instructions, suggestions and advice that increase self-efficacy. Self-efficacy is the measurement of individuals' confidence in their abilities to perform specific tasks to achieve successful completion in relation to managing asthma. This confidence in their perceived abilities is very helpful to control their asthma (Wigal et al., 1993).

Asthma self-efficacy is the belief that patients can actually perform skills to manage their asthma, such as using an inhaler correctly, and assessing symptoms. Patients can decide on the most beneficial action to manage the asthma symptoms (Hanson, 1998). Self belief influences a patient's thought patterns, emotions and actions. It also influences human behaviors. Self-efficacy beliefs provide the foundation for patient motivations, well-being, and accomplishments (Ngamvitroj & Kang, 2007; Pajares, 2007). Self-efficacy can influence patients function. Although their skills may be applied in critical situations, Bandura (1994) has indicated that beliefs about the

level of motivation, the affective state, and knowledge of actions to be taken, are all necessary to achieve the goal of managing asthma and asthma attacks.

5. *Factors influencing self-efficacy in skill management of asthma*

Self-efficacy in asthma self-management is the belief that one can actually perform the behaviors and skills that are believed to help in coping with asthma. Patients are required to perform a number of skills and behaviors, such as using an inhaler correctly, assessing symptoms, and deciding on the most beneficial action to manage their symptoms.

Some factors that can influence performing the skills that are required for the management of asthma are locus of control, goal orientation, social support, and level of education. These can be described as follows:

- 1) Locus of Control refers to a patient's beliefs about factors that control health. These include self-actions (the internal locus of control) and the actions of people with power, such as skilled physicians (the external locus of control) (Rotter, 1966 as cited in Maddux, 1991). People who have a greater internal locus of control believe that they can control their own health and are more likely to adhere to medication regimes (Apter, Reisin, Affleck, Barrows, & Zuwallack, 1998; Charyl, Eddie, Matthew & Darcell, 2000).
- 2) Goal orientation is important while managing diseases, and this also affects the self-efficacy of patients. They can select the best way to solve their problems or treat their disease. If the patients set the goals, they will have more motivation in managing the disease (Baer & Christensen, 1999).
- 3) Social support is one of many ways to increase self-efficacy among asthma patients who wish to manage their disease (Valerio, Cabana, White, Heidmann, Brown, & Bratton 2006). Social support and asthma knowledge might be important factors for asthma self-management behaviors (Sin, Kang, & Weaver, 2005). The types of social support include emotional support, instrumental support, informational and appraisal support (Haney & Israel, 2002 cited in Ngamvitroj & Kang, 2007). The sources of social support may include the family, friends, work, organizations, the community, and caregivers. Caregivers have to understand how to motivate patients to manage their asthma. Caregivers also need to know about asthma emergencies so that asthma can be controlled and

managed. Support systems can mediate a smooth transition in developing self-efficacy, and thus may play an important role in helping patients to take care of themselves. Support from organizations (groups) is very important for asthma patients. Asthma patients can share experiences with group members and learn new information to treat asthma from them. Belief in their confidence in coping with the disease will be easier to apply this information in daily life.

- 4) Level of education can influence individuals' perceptions about managing asthma. People who have higher level of education will be more aware of their disease. They are also more proactive and confident for discussing about solutions to their problems with their physicians (Vries, Mesters, Jonathan, Willems, & Reubsat, 2006).

6. Asthma Educational Program

Attending asthma educational program can improve self-efficacy. Patients can receive the information about asthma. They can manage their asthma by sharing experiences, brain storming, observing, and demonstration. Sharing experience can evaluate performance in relation to some self-standard or external comment given by each member and trainer. Brain storming is one way media to solve the problem by collect the information from each member. Observing the performance of others to do deep breathing and used the inhaler is method that can help patients to do in the right way. Demonstration was also importance part to increase patient's skill to do deep breathing and used inhaler. However the researcher can provide motivation by positive reinforcement during asthma educational program. The aim of an asthma educational program is to help asthma patients for integrating their previous ideas and beliefs about asthma by introducing them to current knowledge and giving them more information (Kara & Turkinaz, 2004).

Asthma educational program is a form of treatment of the disease. Asthma educational program can improve the knowledge and skill of asthma patients (Schaffer & Yarandi, 2007). Therefore asthma educational programs can change the behaviors of asthma patients and make them healthier so that they can lead a normal life (Trollvik et al., 2005). Patients' beliefs will influence the success of the educational program and may help clinicians counsel effectively to promote adherence (Kelly, Halterman, Lynch, & Cabana 2007).

Asthma educational programs lead to improve health outcomes by providing information, counseling, changing in therapies, and instructing the use of the peak flow to monitor symptoms (Trollvik et al., 2005). Barriers that influence the success of asthma educational programs are the lack of support by participants, staff and management. The common barriers to the success of health promotion are lack of support from participants (48.0%), lack of staff resources (50.1%) and lack of support from management (37.0%) (DHSS, 2007).

The literature on self-efficacy makes it clear about the goals or aims of an asthma educational program, and the objectives of the program include (Hanson, 2007):

- 6.1. To increase self-efficacy that can make sufferer confident so that they can manage their asthma and asthma attacks effectively.
- 6.2. To increase improve health care assess and quality of life of asthma patients.

This means that the skills, attitudes, and experiences provided by an asthma program are used as the steps to achieve the aim or goal of the program. Thus the overall aim is to develop the self-efficacy of the patient in relation to controlling his or her asthma.

7. The effect of asthma educational program on self-efficacy

After attending the asthma educational program, asthma patients have increased self-efficacy and a more confident in treating asthma episodes (Hanson, 2007). Through the educational program, the self management of asthma can be improved. The program can help patients develop greater self-efficacy to control asthma. In COPD patients, the effect of education can help patients for increasing their confidence in their own ability to manage, or to avoid, breathing difficulties while doing routine activities. In turn, increasing individuals' level of confidence may assist them in performing daily activities more frequently (Kara & Turkinaz, 2004).

Educational program helps to raise the levels of self-efficacy of participants to manage their asthma, and gives them the practice that is needed to gain necessary experience. The strategies that required improving participants' levels of self-efficacy should be appropriate for the participants and goals of the program (Kurbanoglu, 2003).

Summary

Asthma is chronic respiratory disease that causes difficulty in breathing. Commonly, patients with asthma have a history of allergy. When asthma attacks occur they feel difficulty in

breathing. Many caregivers and asthma patients are become confused and stressed during asthma attacks. They can go to emergency departments to treat the condition.

Asthma can be managed by preventing asthma triggers, using medication properly and performing deep breathing. Many previous studies suggested that asthma educational programs can improve self-efficacy in the management skills that needed to control asthma. Such programs provide information about asthma management to improve the confidence of patients. They focus on mastery experience, vicarious experience, social persuasion and emotional state to increase patients' self-efficacy. Self-efficacy in asthma management skills can be influenced by following factors the locus of control, goal orientation, social support, and the level of education. Patients who have higher level of each factor are more confident about managing their asthma. They can prevent asthma triggers, use inhalers properly and control asthma symptoms and thus lead a normal life.

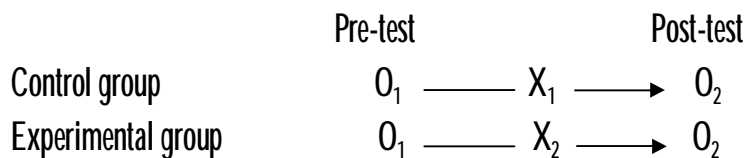
CHAPTER 3

RESEARCH METHODOLOGY

This chapter describes the research design, population, sample selection and size, educational program, instrumentation, protection of human rights and ethics, data collection, and data analysis.

Research Design

This quasi experimental, pre-post test study was designed to evaluate the effect of asthma educational program on self-efficacy in asthma management skills. The research design was as follows:



O_1 refers to the baseline data (pre-test score) of self self-efficacy in the skill management of asthma. O_2 refers to the data on self-efficacy in the skill management of asthma that was collected after the asthma educational program (post-test score).

X_1 refers the routine care on self-efficacy in the skill management of asthma which that was applied in Medical ward.

X_2 refers the asthma educational program on self-efficacy in the skill management of asthma which that was applied in 2 sessions.

Controlling the threats to internal validity

This study was a quasi-experimental study. In this situation a threat to internal validity means threat to causal control. There were some threats to internal validity including history, maturation, test, instrumentation, and regression. The following steps were intended to offset these threats:

History: during the data collection process the researcher constantly observed the condition of the sample approximately for 3 days. During this period, the sample did not given other education program. Furthermore, the pre-test and post-test was administered on both experimental and control groups.

Maturation: data from each group was obtained at the same time, and both groups were tested at the beginning of the asthma educational program in order to control other variables. The scores of the test were analyzed to assess whether there are differences in the variables in the study.

Instrumentation: the data collection was administered by the research assistant using the same questionnaire (a self-efficacy asthma questionnaire) and method.

Regression: During post test the extreme score tend to regress toward the mean even without treatment. Therefore, to avoid regression both the experimental and control groups were tested before provide asthma educational program. Therefore, the participant should be no threat of regression.

Selection: A data collection was started from the control group until get the number 25, and continue to the experimental group. This setting helps the possibility that the testing threat may not occurs in the control group.

Population and Setting

The target population was the adult asthma patients who range 18 years and over. The study is conducted at Arifin Ahmad hospitals in Pekanbaru, Indonesia because it is located in the centre of Pekanbaru and it is a largest hospital, and teaching institution.

Sample

Sample size

Power analysis was used to determine the number of subjects for this study. It is useful to determine the effect size to 0.8 and the power 0.5 (Cohen, 1988). It is used to determine the significance of the study at 0.05, the effect size at 0.8 and power at 0.8 (Cohen, 1988). According to the Cohen formula, the study was required 50 subjects, 25 subjects each group (Appendix A). Kara and Turkinaz (2003) studied the effect of education on the self-efficacy of Turkish patients with chronic obstructive pulmonary disease. Their study was recruited 60 subjects and the effect size

was 1.63 and it found a significant improvement in total score of self-efficacy ($F=8.8$, $p < .001$). Following the effect size of Kara and Turkinaz (2003), this study was also recruited smaller sample size. Therefore, the justification of effect size in this study was 0.8 at a power of 0.8.

Sampling Methods

Purposive sampling methods were used for the selection of the qualified subjects for this study. The criteria for eligible subject were as follows:

1. Have a confirmed diagnosis of asthma and admitted in the Arifin Ahmad hospital
2. Don't have dyspnea
3. 18 years old and above
4. Prescribed to use an inhaler medication
5. Able to communicate in the Indonesia language

Matching the selection was used to control the homogeneity of recruitment of patients for this study by purposive sampling between experimental and control group. The matching of patients includes age (18-35, >35-55, >55), sex (male and female), education level (elementary, junior high school, high school, diploma, and bachelor), and income per month (<1,000,000 IDR, 1,000,000 – 2,000,000 IDR, >2,000,000 – 3,000,000 IDR, and > 3,000,000 IDR). The researcher started with the control group and continued with the experimental group to reach the required number. Fifty patients were selected, 25 patients in the control group and 25 patients in the experimental group as shown in Figure 2.

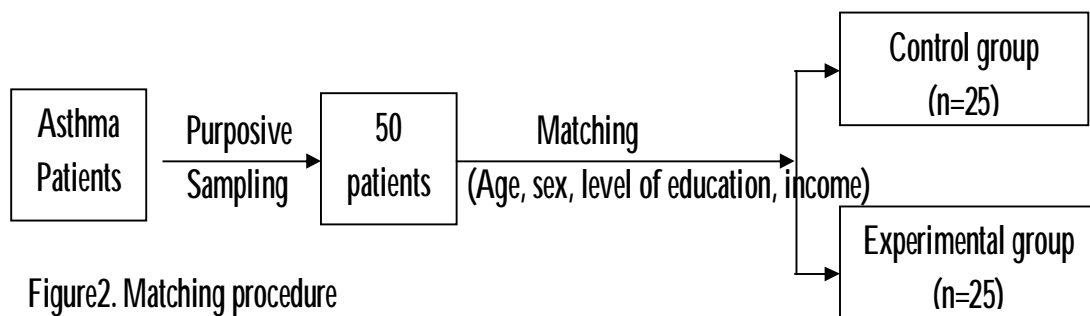


Figure2. Matching procedure

Instrumentation

Two parts of instruments were used data collection. The first part of instrument, a demographic data and health information form has been created by researcher. It was used to assess demographic data such as age, gender, religion, and level of education, marital status, occupation, income, and duration of illness and family member, and the health information such as underlying diseases, diagnoses and currently prescribed medication, and the second part of instrument was a self-efficacy asthma questionnaire. It was used to measure changes in self-efficacy in avoiding asthma triggers, controlling asthma symptoms, and using inhaler after following an intervention. The questionnaire consisted of three domains that dealing with of avoiding asthma triggers, controlling asthma symptoms, and using inhaler (Appendix C). Avoiding asthma triggers had 7 questions (No.1, 2, 3, 4, 5, 6, and 7). Controlling asthma symptoms had 6 questions (No. 8, 9, 10, 11, 12, 13) and using inhaler had 7 questions (No. 14, 15, 16, 17, 18, 19, 20). The questionnaire had 18 positive statements and 2 negative statements.

The self-efficacy asthma questionnaire used a rating scale ranging from 1 to 5 (1: not at all confident, 2: Not very confident, 3: Somewhat confident, 4: Pretty confident, and 5: Very confident). The total scores were ranged from 20 to 100. The higher scores mean the patients had more confidence in avoiding asthma triggers, using medication such as an inhaler, and managing activities related to the control of asthma. The level of self-efficacy was divided into three levels:

Level 1: High self-efficacy (81-100)

Level 2: Moderate self-efficacy (61-80)

Level 3: Low self-efficacy (20-60)

Each domain of self-efficacy in skill management of asthma was score based of the number of question. The first domain (avoiding asthma triggers) and third domain (inhaler technique) have an equal number of questions (7 questions), so the score were ranged from 7 – 35. The level of avoiding asthma triggers and inhaler technique was divided into three level; high (29-35), moderate (21-28), and low (7-20).

The second domain (controlling asthma symptoms) has 6 questions. The score was ranged from 6 – 30. The level of controlling asthma symptoms was divided in three levels; high (25-30), moderate (18-24), and low (6-17).

Validity of the instrument

The content validity of self-efficacy asthma questionnaire, teaching plan of asthma educational program, and the handbook were evaluated for appropriateness of illustration by three experts by using a content validity index (CVI). The researcher would consider the acceptable level of CVI of self-efficacy asthma questionnaire at the level of 0.80. The first expert was a lecturer from the area of asthma patients care, Faculty of Nursing, Prince of Songkla University, Thailand. The second expert was an Indonesian nurse who is an expert in asthma care, and the third expert was an asthma consultant from the Medical Faculty of Riau University, Pekanbaru, Indonesia. The researcher modified the questionnaire in accordance with the recommendations of the experts. The CVI of the self-efficacy asthma questionnaire was 0.91. The CVI of each dimension in self-efficacy in skill management questionnaire were as follow: 1) avoiding asthma triggers (0.86), 2) controlling asthma symptoms (0.92), and 3) using inhaler (0.96).

Reliability

The reliability of the asthma questionnaire was tested by using it with 50 patients with asthma who met the inclusion criteria. The Cronbach's alpha coefficient was analyzed for assessing the management skills for controlling asthma. The Chronbach's alpha of reliability of asthma self-efficacy questionnaire was .83.

Translation of Instrument

The questionnaire was translated with a back translation method. This method consists of three phases. Firstly, the questionnaire of English version was translated into Indonesia version by bilingual translator. Secondly, the Indonesian version was translated back into English version by bilingual translator, and thirdly, the original questionnaire and the English back translated questionnaire was evaluated by bilingual English expert for discrepancies.

Intervention: The Asthma Educational Program

Asthma educational program was developed by the researcher. The asthma educational program plan was covered: experience of mastery; vicarious experience; social persuasion and emotional state (Appendix A). The asthma educational program was accompanied with a handbook for guiding asthma patients to manage their asthma at home. The contents of the handbook were as follows:

1. Definition of asthma
2. Physiology of respiratory tract: normal and abnormal
3. Asthma triggers
4. Signs and symptoms of asthma
5. Asthma medication
6. Asthma management
7. Deep breathing
8. Use of Inhaler
9. Use of Spacer
10. Use of nebulizer
11. Cleaning of Inhaler, spacer and nebulizer

Asthma Educational Program sessions

The first session

In the first session the asthma educational program provided information of asthma, management of asthma was including how to avoiding asthma trigger, control asthma symptoms and demonstration of inhaler use and deep breathing. This session covered mastery experience, vicarious experience, social persuasion and emotional state. The asthma educational program was given in a small group 3-5 patient, taking approximately one hour.

1. Mastery experience

The researcher and patients interacted and discussed. Their success and failures experience about asthma management and practiced deep breathing and inhaler use that helped to enhance self-efficacy. Through their experiences, participant developed their capabilities to manage their asthma.

2. Vicarious experience

In the second step, patients learned from role models. They observed and watched patients who successfully manage asthma by avoiding asthma triggers, using an inhaler and controlling asthma symptoms. Brainstorming method was used to explore the participants feeling after watching the role model. The researcher provided the equipment that they need. The researcher showed how to use the equipment and providing the handbook for guiding the patients in managing their asthma.

3. Social persuasion

Patients got instructions, suggestions and advice from the researcher and their peer group. Positive reinforcement from the researcher or peer group was provided during practice to prevent asthma triggers, use inhalers, practice deep breathing, and control asthma symptoms. Touching and nonverbal rewards were also provided to motivate participants to learn more and build up their confidence in managing their asthma. The researcher helped them when they made mistakes. Peer group helped participants to check how many steps of inhaler use they can do rightly. Families also facilitated the participants to do deep breathing and use inhaler.

4. Emotional state

Patients learned how to manage potential conflicts about physical activities with family and friends, and how to reduce stress when asthma attacks occur. Education and discussion regarding physiological, state such as alleviating fear, stress, anger and negative emotion. The strategies increased participant's belief that they can manage difficulty of any situation effectively.

The second session

This session elapsed time from the first session was arranged in pulmonary clinic. This session was provided 5 days after the first session. The asthma educational program also was given in small group Of 3-5 including the caregiver. In the second session, the asthma educational program followed up and reviewed the activities, the researcher discussed with the patients and their family members by asking the question that surrounding asthma management. Asthma management was included avoiding asthma triggers medication treatment and using inhalers and controlling asthma symptoms by deep breathing. This session also covered mastery experience,

vicarious experience, social persuasion and emotional state. The time given for reviewing was approximately one hour.

1. Mastery experience

The researcher followed up the patient's feeling after attending in the first session of asthma educational program. They were asked how to identify asthma triggers and symptoms and when they have to take medicine. They were given demonstrations on how to use inhalers and deep breathing. They learned more about the good postures when an asthma attack occurs. The researcher asked about the barriers they meet while doing activities to manage their asthma. Patients kept practicing until they do using inhaler and deep breathing activities correctly by themselves.

2. Vicarious experience

The researcher followed up the patient's capabilities to manage their asthma after attending the first session. Patients were asked how to prevent asthma triggers and how to control asthma symptoms. The asthma patients were asked to consider their confidence in using the equipment and performing the postures that asthma patients should adopt when asthma attacks occur. The researcher also repeated demonstrations on inhalers use, deep breathing and cleaning equipment.

3. Social persuasion

In the second session, the researcher followed up patients' family support by asking is their family encourages them more to manage their asthma. The researcher discussed with a family about the importance of their support and encouragement to patients for doing deep breathing and for using inhaler. In this section patients were given more confidence about activities that help to manage their asthma by helping them and providing feedback from the researcher and peer groups.

4. Emotional state

The researcher reviewed patient's confident about asthma management. Patients were asked what they feel about the benefits of the asthma educational program for them. Researcher also observed the emotion reactions of patients during asthma educational program.

Intervention Procedure

The researcher explained objectives of the study, subjects' rights, and outcomes of the study to the subjects. When the subject agreed to participate in this study, consent form was given. The demographic data and asthma self-efficacy questionnaire were provided to both groups (control and experimental). Asthma education program was provided when patients did not have dyspnea, after treatment in the ward and the second session was continued in the out patient department (OPD) while patients follow up their condition. Approximately each session need 1 hour.

The suitable subjects in the study were divided into two groups: control and experimental groups. There were 25 subjects in each group. The researcher started with the control group. The control group received only the routine care by doctors and nurses in the medical ward. The routine care consists of medication treatment, personal hygiene, and encouraging the patients before discharge to follow treatment regimen by making routine appointment at the outpatient clinic. The experimental group received routine care and asthma educational program by the researcher.

In this study, the researcher used LCD/ slide show to give the information by using the pictures related to asthma knowledge including normal and abnormal physiology of respiratory, signs and symptoms, risk factors, asthma triggers, medication, asthma management and asthma management skills. The researcher also demonstrated how to use inhaler, deep breathing, clean the inhaler equipment and how to take a good position when dyspnea occurs. The researcher, patients and family members were interacted and discussed how to improve self efficacy in asthma management. In the second session the researcher followed up patient's capabilities to management of asthma.

After ending asthma educational program in OPD, the researcher assistance evaluated intervention asthma education by using the self-efficacy asthma questionnaire.

Data Collection

After receiving permission from the Faculty of Nursing, Prince of Songkla University, Thailand, the researcher collected data at Arifin Ahmad Hospitals, Pekanbaru, Indonesia. The steps of data collection were as follows :

1. Preparation phase

1.1. Ethics approval was obtained by research ethics committee and the permission letter was granted by Institutional Review Board (IRB) of the Dean of Faculty of Nursing, Prince of Songkla University, Thailand.

1.2. The researcher sent a permission letter for data collection to the Director of Arifin Ahmad Hospitals Pekanbaru, Indonesia.

1.3. A research assistant from nursing faculty, Riau University, Indonesia helped the researcher for data collection. The researcher trained the research assistant until she was understand the self-efficacy asthma questionnaire well. The researcher explained to the research assistant of the data collection procedure, and the research assistant also received the contents and manual handbook of asthma educational program to make her was understand about asthma. The research assistant practiced to use demographic data and self-efficacy asthma questionnaires under observe the researcher.

1.4. The research assistant selected the place, equipments and media to give educational program.

1.5. Before conduct to the asthma educational program on self-efficacy in skill management of asthma, the pilot study was apply to 5 asthma patients in medical ward of Arifin Ahmad Hospital Pekanbaru, Indonesia.

2. *Implementation phase*

2.1. The subjects were asked permission for data collection.

2.2. The researcher explained the objective and benefits of the study and subjects' rights.

2.3. The subjects completed the questionnaires approximately 30 minutes before the educational program. Subjects who could not read were helped by researcher or research assistance.

2.4. Educational program was held in the conference room of Medical ward.

2.5. The activities of asthma educational program followed the teaching plan.

Control Group

The researcher explained the purpose of the study to all the subjects of this study. When they agreed, the researcher took them to sign on consent form. After having permission from the subjects, the researcher asked the subjects to complete the demographic data, and health information form, and asthma self-efficacy questionnaire. The post-test of asthma was delivered to subjects after the second session of asthma educational program and was collected by the research assistant to reduce bias of result.

Experimental Group

The subjects were asked to complete the demographic data, and health information form and asthma self-efficacy questionnaire before intervention of asthma educational program. Discharged were appointed to continue the second session. After completing the two sessions of intervention, research assistance distributed asthma self-efficacy questionnaires. Completing the post test asthma self-efficacy, the researcher acknowledged the participants for participate their voluntarily.

Protection of Human Right and Ethics

All subjects were given both written and oral information about the purpose of the study. Informed consent was verbally obtained from the subjects. They were informed that they could be freely withdrawn from the study at any time without any consequences. Data of subjects were treated anonymity and kept confidentiality by researcher to protect subject's privacy through anonymity. This study aimed at causing minimal harm to the subjects such as anxiety and dyspnea during the asthma educational program. Approval was proposed to Ethics Research Committee of Faculty of Nursing, Prince of Songkla University, Thailand. Before collecting the data, the researcher permission for data collection was obtained from Director and informed to head nurses in medical ward and pulmonary clinic to conduct research in Arifin Ahmad Hospital Pekanbaru, Indonesia.

Data Analysis

Data were analyzed by using the descriptive statistics and inferential statistic which included chi-square, paired t-test and t-test. The level of significance for rejecting a null hypothesis is defined at .05. The descriptive statistic was used for a analysis of demographic data, and health information which included frequency, percentages, range, mean and standard deviation. Paired-test and t-test were used to compare mean score of self-efficacy in asthma management skills with in group and between group.

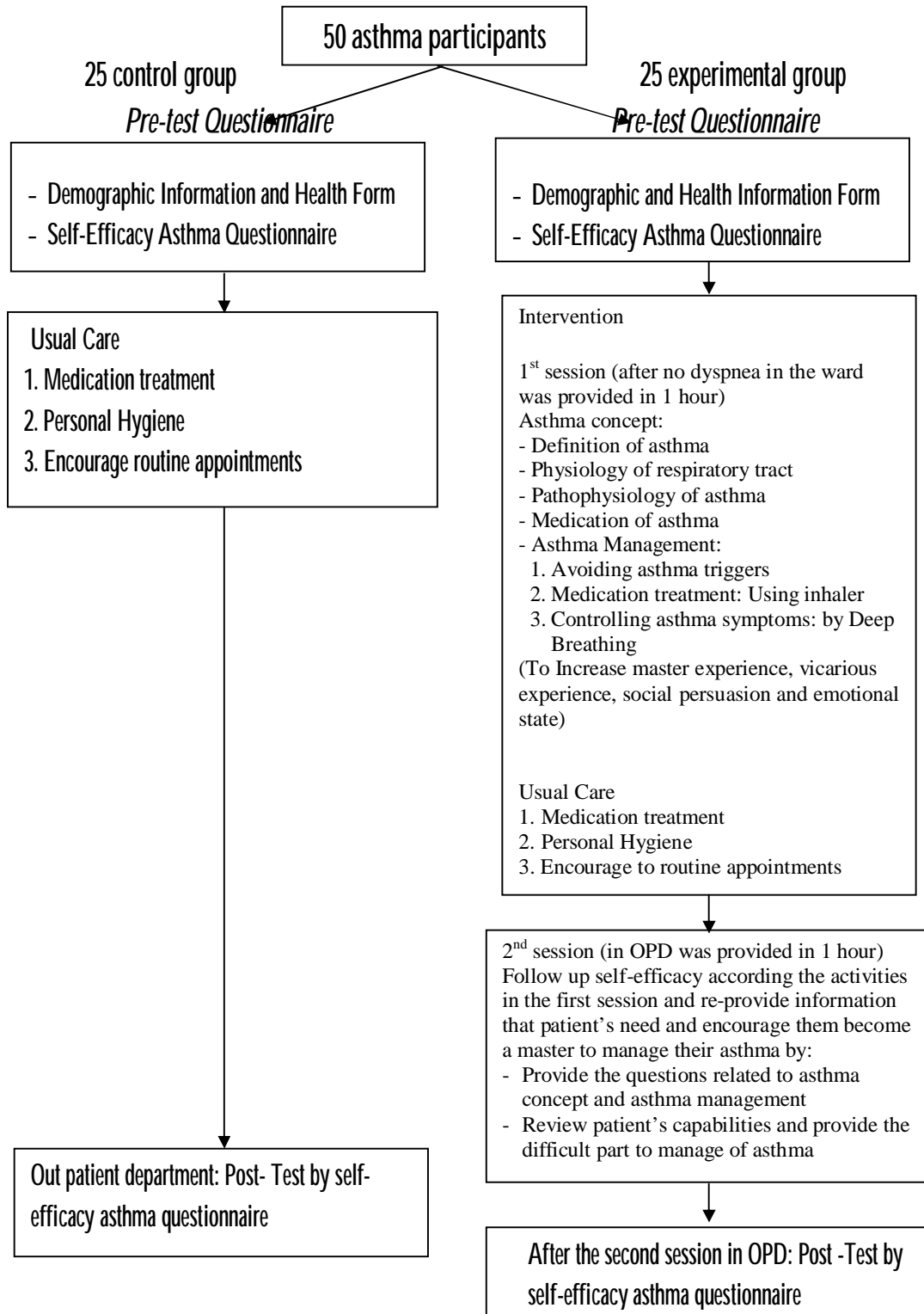


Figure.3: Flowchart of participant recruitment and completion of program.

CHAPTER 4

RESULTS AND DISCUSSION

This study aimed to compare self-efficacy in skill management of asthma patients before and after attending the asthma educational program (AEP) in Pekanbaru, Indonesia. Total 50 adult asthma patients, who admitted in Medical ward of Arifin Ahmad Hospital, were recruited in the study, and equally divided into 2 groups: experiment group and control group. Experiment group consisted of 25 subjects who received the AEP and handbook, and control group consisted of 25 subjects who received routine care.

Results of the study are presented as follows:

1. Subjects' characteristics and health information
2. Self-efficacy score of experimental and control group
3. Comparison of mean score of self-efficacy in skill management of asthma within the control group and the experimental group before and after asthma educational program
4. Comparison of mean score difference of self-efficacy in the skill management of asthma between experimental group before and after asthma educational program

Results

Subjects' characteristics and health information

Table 1 shows the demographic characteristic and health information of subjects in the 2 groups. Chi-square test was used for categorical data (gender, age, religion, marital status, education, occupation, household income, living with, underlying disease, the length of time having been diagnosed with asthma and medication). Regarding the gender of the subject 52% were male and 48% were female. Most of them were married (experimental group = 80%, control group = 72 %). The average age of the subjects were 46.09 years (SD = 16.83). There was no statistically significant difference between the experimental group and control group regarding demographic data and health information ($p > .05$).

Most of the subjects (96%) were Islam. The education level of most of the subject majority was high school (36%), and 10% of the subjects had junior high school. Thirty eight

percent (38%) of the subjects were unemployed. Majority of the subjects had income (30%) less than 1,000,000 IDR (\$100) per month. Most of the subjects (76%) were living with spouse (husband and wife) and only 2% were living in others places (living with children, grand children and cousin). Most of them (60%) did not have any underlying diseases, some of them had Cardiovascular disease (4%) and 20% subjects had others diseases (Arthritis, Diabetes Mellitus, Depression, Glaucoma, Migraine, Eczema, Hepatitis). The duration diagnosed with asthma were 5 to 10 years (38%), and more than half of the subject (68%) using medications to control asthma attacks.

Table1

Frequencies and percentages of the respondents according to demographic characteristics and health information

Characteristics	Experiment group		Control group		Total		χ^2	p-value
	n	%	n	%	N	%		
Gender							1.00	.61
Male	13	52	13	52	26	52		
Female	12	48	12	48	24	48		
Age							.60	.74
Early adulthood (18-35 years)	7	28	8	32	15	30		
Middle adulthood (>35-55 years)	13	52	14	56	27	54		
Late adulthood (>55 years)	5	20	3	12	8	16		
	(M = 48.83, SD = 5.44)		(M = 43.48, SD = 18.23)		(M = 46.09, SD = 16.83)			
Religion							2.08	.15
Islam	23	92	25	100	48	92		
Christian protestant	2	8	0	0	2	8		
Marital status							.58	.90
Single	3	12	4	16	7	14		
Married	20	80	18	72	38	76		
Widowed	1	4	2	8	3	6		
Divorced	1	4	1	4	2	4		

Table 1 (continued)

Characteristics	Experiment group		Control group		Total		χ^2	p-value
	n	%	n	%	N	%		
Education							2.47	.65
Elementary	7	28	5	20	12	24		
Junior high school	1	4	4	16	5	10		
High school	10	40	8	32	18	36		
Diploma	3	12	3	12	6	12		
Bachelor	4	16	5	20	9	17		
Occupation							3.03	.55
Unemployed	8	32	11	44	19	38		
Farmer	1	4	3	12	4	8		
Businessman	5	20	2	8	7	14		
Private employee	3	12	2	8	5	10		
Government employee	8	32	7	28	15	30		
Income							4.23	.23
< 1,000,000 IDR	5	20	10	40	15	30		
1, 000,000- 2,000,000 IDR	9	36	6	24	15	30		
> 2, 000,000-3,000,000 IDR	7	28	3	12	10	20		
>3, 000,000 IDR	4	16	6	24	10	20		

Table 1 (continued)

Characteristics	Experiment group		Control group		Total		χ^2	p-value
	n	%	n	%	N	%		
Living with							5.55	.24
Husband	9	36	14	56	23	46		
Wife	11	44	4	16	15	30		
Parents	3	12	3	12	6	12		
Friends	2	8	3	12	5	10		
Others	0	0	1	4	1	2		
Underlying disease							.23	.99
None	15	60	16	64	31	62		
GI problem	3	12	2	8	5	10		
Eclampsia	1	4	1	4	2	4		
Cardiovascular disease	1	3.6	1	4	2	4		
Others	5	21.4	5	20	10	20		
The length of time having been diagnosed with asthma							2.02	.73
< 5 years	7	28	4	16	11	22		
5-10 years	10	40	9	36	19	38		
10-15 years	5	20	9	36	15	30		
>20 years	3	12	2	8	5	10		

Table 1 (continued)

Characteristics	Experiment group		Control group		Total		χ^2	p-value
	n	%	n	%	N	%		
Medication used							4.29	.37
Step 1 (rapid acting inhaled β 2-agonist)	1	4	5	20	6	12		
Step 2 (low dose inhaled glucocorticosteroid)	17	68	14	56	31	62		
Step 3 (relieve medication plus one or two control medication)	1	4	2	8	3	6		
Step 4 (combined between 400 μ g budesonide daily and long acting inhaled β 2-agonist)	3	12	3	12	6	12		
Step 5 (includes reliever medication plus additional controller medication options)	3	12	1	4	4	8		

Self-efficacy score of experimental and control group

Self-efficacy in skill management of asthma was measured in three domains: avoiding asthma triggers, controlling asthma symptoms and inhaler technique. The possible score of avoiding asthma triggers and using inhaler were 7-35, and score of controlling asthma symptoms was 6-30. The possible total scores self-efficacy in skill management of asthma was 20-100. The total and subtotal scores of self-efficacy in skill management of asthma of experimental and control groups are presented in Table 2 and 3. The subtotal scores were divided each domain by total number of question.

The total mean score self-efficacy in the skill management of asthma of the experimental and control group in this study ranging from 1.79 to 3.29. The total scores self-efficacy in the skill management of asthma in experimental group was higher after attending in asthma educational program, and the control group was slightly increase after got routine care (see in Table 2 and 3).

Table 2

Mean score, standard deviation, and level of self-efficacy in skill management of asthma before asthma educational program between experimental and control group (N=50.)

Self-efficacy in skill management of asthma	Experimental group (n=25)			Control group (n=25)		
	Mean	SD	Level	Mean	SD	Level
Avoiding asthma triggers	1.89	.52	Low	1.94	.49	Low
Controlling asthma symptoms	1.96	.20	Low	1.97	.17	Low
Using inhaler	1.57	.44	Low	1.65	.43	Low
Overall	1.79	.33	Low	1.85	.31	Low

Table 3

Mean score, standard deviation, and level of self-efficacy in skill management of asthma after asthma educational program between experimental and control group (N=50.)

Self-efficacy in skill management of asthma	Experimental group			Control group		
	Mean	SD	Level	Mean	SD	Level
Avoiding asthma triggers	3.49	.94	Moderate	1.96	.48	Low
Controlling asthma symptoms	3.24	.75	Moderate	1.96	.19	Low
Using inhaler	3.13	.58	Moderate	1.78	.29	Low
Overall	3.29	.57	Moderate	1.85	.31	Low

Comparison of mean score difference of self-efficacy in the skill management of asthma within experimental and control group before and after asthma educational program

Paired t-test was used to compare the mean score of before and after asthma educational program on self-efficacy in the skill management of asthma within experimental group and control group. The mean score of self-efficacy in the skill management of asthma within experimental group showed increase after AEP. Table 4 reveals significant change in self-efficacy in the skill management of asthma, in avoiding asthma trigger (paired-t = -14.50, $p < .001$), followed by controlling asthma symptoms (paired-t = -9.41, $p < .001$), and using inhaler (paired-t = -7.93, $p < .001$).

Table 4

Comparison of mean differences and standard deviations of self-efficacy in skill management of asthma before and after asthma educational program within experimental group (n=25).

Self-efficacy in skill management of asthma	Before AEP		After AEP		Paired-t
	Mean	SD	Mean	SD	
Avoiding asthma trigger	1.57	.44	3.13	.58	-14.47***
Controlling asthma symptoms	1.88	.52	3.49	.94	-9.41***
Using inhaler	1.96	.20	3.24	.75	-7.93***
Overall	1.79	.33	3.29	.53	-14.47***

*** $p < .001$

Table 5 reveals change in self-efficacy in the skill management of asthma within control group showed increase after got routine care, in using inhaler (paired-t = -3.12, $p < .01$), controlling asthma symptoms (paired-t = 1.00, $p = ns$), and avoiding asthma trigger (paired-t = -1.81, $p = ns$).

Table 5

Comparison of mean differences and standard deviations of self-efficacy in skill management of asthma before and after routine care within control group (n=25).

Self-efficacy in skill management of asthma	Before routine care (n=25)		After routine care (n=25)		Paired-t
	Mean	SD	Mean	SD	
Avoiding asthma trigger	1.94	.49	1.96	.48	-1.81 ^{ns}
Controlling asthma symptoms	1.97	.17	1.96	.19	1.00 ^{ns}
Using inhaler	1.65	.43	1.78	.29	-3.12**
Overall	1.85	.31	1.87	.25	-3.32**

ns $p > .05$, ** $p < .01$

Comparison of mean score of self-efficacy in skill management of asthma between experimental and control group before and after asthma educational program

Table 6 shows that the mean score of self-efficacy in skill management of asthma before attended in asthma educational program were not significant statistically difference between experimental and control group ($t=.38, p>.05$). Table 7 shows that after experimental group attend in asthma educational program had significant statically difference. Independent t-test was applied to examine the difference between the mean score of the experimental and control groups. The result showed that means score of self-efficacy in skill management of asthma after attend in asthma educational program were statistically significant difference between experimental and control group at ($t=-8.63, p < .001$).

Table 6

Comparison of mean differences and standard deviations of self-efficacy in skill management of asthma before asthma educational program between experimental and control group (N=50).

Self-efficacy in skill management of asthma	Experimental group (n=25)		Control group (n=25)		t
	Mean	SD	Mean	SD	
Avoiding asthma trigger	1.89	.52	1.94	.49	.40 ^{ns}
Controlling asthma symptoms	1.96	.20	1.97	.17	.13 ^{ns}
Using inhaler	1.57	.44	1.65	.43	.60 ^{ns}
Overall	1.79	.33	1.85	.31	.38 ^{ns}

ns $p>.05$

Table 7

Comparison of mean differences and standard deviations of self-efficacy in skill management of asthma after asthma educational program between experimental and control group (N=50).

Self-efficacy in skill management of asthma	Experimental group (n=25)		Control group (n=25)		t
	Mean	SD	Mean	SD	
Avoiding asthma triggers	3.49	.94	1.96	.48	-7.23**
Controlling asthma symptoms	3.24	.75	1.96	.19	-8.28***
Using inhaler	3.13	.58	1.78	.29	-10.38*
Over all	3.29	.76	1.90	.32	-8.63***

* p <.05, ** p<.01, *** p<.001

Discussion

Discussions of the study result consist of characteristics of subjects and health information, self-efficacy score of experimental and control group, and the effect of asthma educational program on self-efficacy in skill management of asthma.

Characteristics of subjects and health information

There were no significant difference between experimental and control group in term of demographic characteristics and health information related to asthma disease. The experimental and control group were middle adulthood majority (35-55 years old) with average age 45.94 years (SD = 17.14). It was found that the number of male subjects (52%) was higher than female (48%) in the experimental and control group. This finding is slightly different from prior research that has found more women than men have asthma caused by the effect of smoking and burn forests that occur every year and according the report from Department Metrology and Geophysical in Pekanbaru from January until February, 2009, the air condition in Pekanbaru was not healthy (Irfandi, 2009). It is similar with the condition asthma patient in Indonesia that there 12

million Indonesian have asthma uncontrolled that caused by lack of information related to asthma, and asthma therapy, bronchodilator addicted and regiment therapeutic. However other studies indicated the effect of smoking habit and passive smoking that caused more airway inflammation in people with asthma (Chen, Dales, Tang & Krewski, 2002; Nawrot, Nemmar & Nemery, 2006; Yunus, 2009). Most of them had income family 200 USD per month and they work as government employee. This probably is due to the fact that the general Hospital is a government facility wherein government employees can obtain free health care.

Most of the subject did not have underlying disease (58.5%). The commonly chief complaint of them was dyspnea caused by environment problems. Air pollution is the most sensitive trigger of asthma. Air condition of Pekanbaru in January until February, 2009 was not healthy. The pollutant standard index (PSI) was 123 (the normal PSI is less than 50). This problem resulted from burning forest (Irfandi, 2009). They were not aware how to avoid impact of air pollution. People went out without masker and they did not avoiding dyspnea when burning forest occurred (Riau info, 2009).

Self-efficacy score of experimental and control group.

Self-efficacy in skill management of asthma in this study includes avoiding asthma trigger, controlling asthma symptoms and using inhaler. The pre-test self-efficacy means score of experimental and control group was at low level, whereas, the level of post-test self-efficacy in skill management of asthma of the experimental group had moderate level after attending AEP. However, the control group had low level after got routine care. The highest mean score of self-efficacy in skill management of asthma was avoiding asthma triggers ($M = 3.49$, $SD = .94$), and the lowest was using inhaler ($M = 3.13$, $SD = .76$) (see Table 3).

The experimental group was more confident to identify what kind of exercise could induce their asthma and to avoiding upper respiratory infection that could trigger their asthma. They were also more confident to do deep breathing while asthma attack by inhale deeply and slowly through their nose and exhale trough their mouth. Besides, they were more confident to perform the correctly position to use inhaler (sitting upright or standing) and to start inhale, while they pressed down firmly on the top of the canister. The experimental group was more confident because of AEP.

The information that patients got from AEP was how to avoid asthma trigger, how to control asthma symptoms and how to use inhaler and deep breathing. Participants were provided information such as definition of asthma, physiology of respiratory tract: normal and abnormal, asthma triggers, signs and symptoms of asthma, asthma medication, asthma management, deep breathing and use of inhaler by using LCD and showing inhaler technique film. They also got handbook that could guide them to manage their asthma at home. This information explained based on 4 sources of self-efficacy (mastery experience, vicarious experience, social persuasion and emotional state) to increase their knowledge and they were more confidence to manage their asthma. According to Young Lee, Hwang, Hawkins and Pingree (2008), providing information to patients related to their illness could effect their perception and increase self-efficacy for managing their disease. Similarly, according to Guevara, Wolf, Grum and Clark (2003), providing information to asthma patients can improve their self-efficacy.

Comparison of mean score of self-efficacy in skill management of asthma within the control group and the experimental group before and after asthma educational program (Hypothesis 1)

The result in the experimental group described that the experimental group who attended in an asthma educational program achieved higher self-efficacy score in the skill management of asthma (avoiding asthma trigger, controlling asthma and using inhaler) than the control group who received routine care. The total mean score of self-efficacy of the experimental group after AEP was significant difference than before (Table 4). In other word, asthma educational program was significantly increased the self-efficacy in the skill management of asthma of the experimental group (paired-t = -14.47, $p < .001$). The highest self-efficacy in skill management of asthma in experimental group was avoiding asthma trigger (paired-t = -14.47, $p < .001$) and the lowest mean score was inhaler technique (paired-t = -7.93, $p < .001$) (Table 5). The changed self-efficacy in the skill management was significantly different. It was because several strategies used included discussion, share experience in peer group, brain storming, and reinforcement, demonstrate, express feeling and show the picture related to how to manage asthma.

These methods were advantage to increase the responsiveness of the participants. Moreover the researcher provides information about the asthma concept by using teaching plan that

content provide the solution to solve common problems of patients with asthma such as how to avoiding asthma attack from exercise, how to avoiding asthma triggers, and how to use inhaler). Beside that the researcher also provided hand book with title healthy life with asthma.

The strategy in this study was able improved self-efficacy to manage asthma disease. The found was similar with studied by Garcia et al, (2002), that the regular asthma education program by using teaching plan was benefit to increase self-efficacy of patients and other study found that using teaching plan to provide asthma information was more effective in decreasing consumption of oral steroid and by used teaching plan seems interesting and easier to participants. This strategy can also reduce the number of visit to emergency department, and number of hospitalization (Daniel, Chow, Lai, Chan, Chang and Yin So, 2006).

The information was provided in peer group. The group arranged in three to five asthma patients and caregivers were recruited in peer group. Each member has the same chance to contribute in the process of AEP and there was no conflict between asthma patients during asthma educational program. The experimental group had increased self-efficacy after attending asthma educational program than before. Poellhuber, Chomienne, and Karsenti (2008) studied influencing of peer group on self-efficacy and persistence measure of experimental group. This study found that educational program was more effective due to presence of peer group because can influence each participant by motivation, sharing information with they have known before such better to use MDI before exercise in the morning to avoid the asthma attack. Poor inhaler technique is a common problem in asthma patients (Nadi & Zeraati, 2005). Asthma patients may have trouble with one or more of the following steps shaking inhaler, exhaling to functional residual capacity or residual volume, coordinating MDI activation and inspiration, inhaling slowly and holding breath for 5 seconds (James, 2005). The same problem was with the patients in this study. After AEP they were still having problem to remove inhaler from their mouth before exhale and breathe normally but they were more confident to take the correctly position while using inhaler (sitting upright or standing) and to placed the mouthpiece of the inhaler in their mouth and to close their lips tightly around inhaler tube. These result indicated that they need regularly formal training on inhaler technique because inhaler technique can improve by educational program (National Asthma Council Australia, 2006).

During provide information in AEP, each care givers always help patients to provide patient's needed and encouraged them when practice to use inhaler. According to Michie, Miles, and Weiman (2002), the caregiver can help patient to build a sense of competence to manage their asthma. Participate of family was importance to increase self-efficacy (Price, 2004). Caregiver can help patients by encouraging them to practice how to use inhaler until they do it correctly. The caregiver also can help to enhance self-efficacy of patients and between them also provide the support to strong emphasis for positive impact (success) of asthma educational program to improve self-efficacy of them (Hanson, 1998, Clark & Partridge, 2002; Kallstrom, (2007). They can help them to achieve their goal by implementing their plan (Kyung Sin, Hee Kang & Weaver, 2005). In this study social support was generally came from a parent or spouse and member group. The family members were always with them. They were very cooperative during AEP in Medical ward and pulmonary clinic.

The finding also showed that there was significant difference within control group after routine care (see Table 5). There was no significant different of self-efficacy on avoiding asthma triggers and controlling of asthma symptoms. The mean score of self-efficacy on avoiding asthma triggers (paired-t = -1.81, p = .08) and controlling asthma symptoms (paired-t = 1.00, p = .33) (see Table 5). Using inhaler was significant deferent after got routine care (paired-t = -3, p <.01).The change mean score increase in control group might due to the information obtained when only the patients needed or having questions related to use inhaler. The other reason might be self-learning. They learnt from their experience because most of them can use inhaler 2 to 3 times each day. They can choice the right way according they are perception when they done as long as they had diagnose with asthma at 5 to 10 years ago. Beside that might be during admitted, they observed other patients when using inhaler.

The control group had never received 4 sources of self-efficacy based on concept of self-efficacy of Bandura. Therefore self-efficacy of the control group on avoiding asthma triggers and controlling asthma symptoms were no significant statically difference. The participants still not very confident to take place the mouthpiece of inhaler device in their mouth and close their lips tightly around the inhaler device. They also were not confident to control asthma symptoms by lie down on the chair or provide the good position to great deal to solve the problem, and in avoidinging asthma trigger, they were not confident to detect the asthma triggers, identify the

exercise that can induce their asthma and they were also still not confident to avoid the allergen that can induce their asthma. According to this finding, the asthma educational program should be provided to increase self-efficacy in skill management of asthma.

Comparison of mean score of self-efficacy in skill management of asthma between the control group and the experimental group before and after asthma educational program (Hypothesis II)

Asthma patients who attended in an asthma educational program achieved higher self-efficacy score in skill management of asthma than those who received routine care.

There was a significant difference of the self-efficacy mean score between experimental group after attended AEP and the control group after received routine care ($p < .001$) (Table 7). The improved mean score of self-efficacy of the experimental group might be contributed by several factors.

Firstly, the AEP was conducted in two sessions. Each session took 1 hour. The first session was provided in Medical ward and the second session was provided 4 days after patients discharge. The second session of AEP was conducted in pulmonary clinic. In the first session the researcher developed the relationship with participants, explained the goal of AEP and provided information of asthma. They also got information how to avoid asthma trigger, control asthma symptoms and demonstrate how to use inhaler and deep breathing. In the second session, the researcher followed up patient's condition after discharge, reviewed the activity in first session, and discussed with the patients and family member by asking the question regarding asthma management.

By providing AEP two times, could improve patients' self-efficacy in manage their disease because they could recall previous information and could stimulate the participant to ask the lack of information in the first session. Review information could make the participants were more remember how to manage their asthma (Scherer et al., 1998 as cited in Kara & Turkinaz, 2003). According to Martin et al (2009), asthma patients self-efficacy could be improved by providing asthma educational in several session because self-efficacy generally could be started from the simple action and the end to be more confident.

Secondly, the structure AEP was covered mastery experience, vicarious experience, social persuasion, and emotional state to increase self-efficacy. For example, to increase self-efficacy in avoiding asthma triggers they discussed how to avoiding asthma attacks during morning exercise, to avoiding contact with dust in a home, in an office and during driving motor cycle. All participants were confident to avoiding asthma triggers after attending AEP.

Mastery experience is built by brain storming, share experience, information between the participants and they discussed about their disease. Participant could practice to be master to using inhaler device. They can practice or learning by doing. They discussed to avoid and remove of the environmental irritants to manage their asthma. Such as how many time have to change the bed sheet per week, what kind of food have to not consume and how to avoiding contact with dust while swap the floor at home. They also shared information how to make effective in using inhaler and they were practicing until correct by following the guideline. For improving self-efficacy in using MDI, patients can observe the common error procedure in use MDI and the task are apt to believe that they can do as well. It means practice could improve knowledge and skill that related to improve patients confidence in managing their asthma (Murphy, Gibson, Talbot, Kessell, & Clifton, 2005). The significance of using inhaler technique associated with patients' experience. Majority of the subjects had been diagnosed with asthma for 5 to 10 years (see table 2). They could not do the good deep breathing before use inhaler and they were not confident in removing inhaler fro their mouth before exhale and breathe normally. This problem may relate to their experiences of living with asthma. It is easier to increase self efficacy in controlling asthma symptoms and avoiding asthma triggers (Lemaigre et al., 2005).

Vicarious experience can be used to increase self-efficacy in using MDI. MDI has an important role in the management of asthma (Banjar, 2003). Patients watched the role model from LCD and the researcher demonstrated to use inhaler in front of the patient. Step by step the procedure was provided. Additional, the patient saw some picture related to how mange asthma from slide was provided. Patients can see how to deep breathing and cough effective to avoiding developing of dyspnea. What kind the good position for them when asthma attack occurs. According to Bandura (1997) that model are most valuable at raising self-efficacy. Individual may learn and become more confident from observing both success and failure, as long as they feel confident that they can avoid repeating the errors they observe.

Social persuasion related to positive feedback (Bandura as cited in Pajares, 2007). It can have a strong influence on improvement of self-efficacy among asthma patients. In this study all participants received motivation, and verbal and nonverbal reinforcement from researcher, group members and caregivers. The instructions, suggestions, and advice were also provided by researcher to increase subjects' self-efficacy in the skill management of asthma. The researcher commonly motivated the participant when they did not want to re-demonstrate to use MDI. They were shy with their mistake after observing the model who using MDI.

Emotional states related to stressful, afraid of dyspnea, arousal, fatigue, and mood states. Commonly the participants did not want to be the first re-presented in using MDI. They negotiate to do it the next time or they prefer to be the last in practice. The persuasive approach by touched, reinforcement, motivation can influence their belief that they can do it as well.

CHAPTER 5

CONCLUSIONS AND RECOMENDATIONS

Conclusion

A quasi-experimental study with 2-groups pre-post-test design was conducted at Pekanbaru, Indonesia from December, 2008 to February 2009 in medical ward and pulmonary discipline clinic of Arifin Ahmad hospital. It aimed to compare self-efficacy in skill management of asthma patients before and after attending the asthma educational program and between the asthma patients who attend asthma educational program and those who received routine care.

Fifty adult asthma patients, who admitted in medical ward, were recruited in this study, and they were divided equally into 2 groups. The experimental group had 25 participants and the control group had 25 participants. The experimental group received the asthma educational program (AEP). They also got hand book about healthy lives with asthma for guiding them in manages their asthma at home. The strategy of AEP covered mastery experience, vicarious experience, social persuasion and emotional state. The data were analyzed by descriptive chi-square, paired t-test, and t-test. The results of the study are summarized below.

Summary of study findings

In this study, the asthma educational program on self-efficacy in skill management of asthma covered mastery experience, vicarious experience, and social persuasion and emotional state to improve the confidence of asthma patients. Self-efficacy in skill management of asthma of experimental group after attending the AEP was significantly higher than ($p < .001$) before. All domains of self-efficacy in experimental group had high mean score, for avoiding asthma triggers ($M = 3.49$, $SD = .94$) and followed by controlling asthma triggers ($M = 3.24$, $SD = .75$), inhaler technique ($M = 3.13$, $SD = .58$). In post test self-efficacy, the asthma patients who attended asthma education program achieved was higher score than those who received routine care (avoiding asthma symptoms $p < .01$; controlling asthma symptoms $p < .001$; inhaler technique $p < .05$).

The Implications and Recommendations

The study showed that asthma educational program can help to increase self-efficacy in skill management of asthma. By learning how to avoid asthma triggers, controlling asthma symptoms, and using inhaler. Patients can be able to manage their asthma. The asthma educational programs provide important information to increase self-efficacies of patients for managing their asthma. Through AEP, the patients can get the new information about asthma and they can practice necessary skill to manage their asthma. Referring to the findings of this study, the following implementations are recommended.

Nursing practice

1. There are some methods were used in this study included discussion, share experience in peer group, brain storming, social support, demonstrate to deep breathing and using inhaler, show the picture related to how to manage asthma, provide hand book, and explained of asthma concept with cover mastery experience, vicarious experience, social persuasion, and emotional state. The nurses can apply this method to encourage self-efficacy in skill management of asthma in avoiding asthma triggers, controlling asthma symptoms, and using inhaler.
2. The level of self-efficacy in skill management of asthma in experimental group was higher than control group after attended AEP. The highest self-efficacy in skill management of asthma was avoiding asthma and the lowest was inhaler technique. Along this line, the nurse should be more attention to patient's skill to using inhaler and need provide regular program of asthma education.

Nursing education

1. The teaching plan should be provided for adult nursing students to guide the students how to provide the information for increasing self-efficacy in skill management of asthma.
2. Nursing students should be encourage to use the concept of self-efficacy to increase self-efficacy in skill management of asthma, especially in avoiding asthma triggers, controlling asthma symptoms, and inhaler technique.

Nursing research

1. The finding can be used as base lined data for development strategies to provide asthma education to increase self-efficacy in skill management of asthma.
2. The result can use as evidence based nursing to apply in the similar population and reference for further experimental study to improve self-efficacy in skill management of asthma.

Limitations of the study

Regardless of the strengths, the limitation of this study was the method that created by researcher. The method was the first times apply to provide information to asthma patients. It was make patients not easy to understand to increase their self-efficacy in manage their asthma. Future the studies need to develop the method and the nurse should implement the method that can help the asthma patient to gain self-efficacy in manage their asthma by cover concept of self-efficacy including mastery experience, vicarious experience, social persuasion and emotional state.

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Appendix A

Intervention Asthma Educational Program on Self-Efficacy in Skill Management of Asthma in Pekanbaru, Indonesia


Intervention Topic	Goal	Content	First session in Medical Ward (1 hour)	Second session in OPD (1 hour)
Introduction	To developpe of relationship between the reasearcher and participants	<p>Good morning. Welcome Group</p> <p>I would like to concern on provide the information to enhance your capability in skill management of asthma. I am nurse that have been opportunity the education in Master of Nursing Prince of Songkla University in Thailand. I am conducting a nursing research project to study comparison the self- confidence in skill management of asthma among asthma patient before and after asthma patients attending in asthma educational program. In this program will provide the knowledge how to prevent asthma triggers, how to control asthma symptoms and how to use inhaler and do deep breathing.</p>		<ol style="list-style-type: none"> 1. Researcher follow up their emotional in manage their asthma. 2. Observe there are feeling (happy or bed mood to joint in asthma educational program)


Intervention Topic	Goal	Content	First session in Medical Ward (1 hour)	Second session in OPD (1 hour)
Mastery experience, Vicarious experience, Social persuasion and emotional state	To identify emotional state of participant (to make sure the participant ready to attend in asthma educational program)		<ol style="list-style-type: none"> 1. Researcher asks to participant about their condition. Are you Ok to attend in this program. 2. Researcher observes participant condition they are ready to learn. 	<ol style="list-style-type: none"> 1. Review patient's perception about asthma before the second session will start. 2. Ask to participant's their experience to apply the information in the first session to manage their asthma.

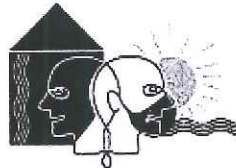

Intervention Topic	Goal	Content	First session in Medical Ward (1 hour)	Second session in OPD (1 hour)
				<p>3. Show some picture related to asthma trigger and ask to participant what are they can induce asthma and what are they can not induce asthma.</p> <p>4. If they know, ask again why can induce and why can not induce?</p>




Intervention Topic	Goal	Content	First session in Medical Ward (1 hour)	Second session in OPD (1 hour)
				<p>5. Provide reinforcement positive while participant can provide the right answer.</p> <p>6. Researcher can make summaries after patients answer the question.</p>

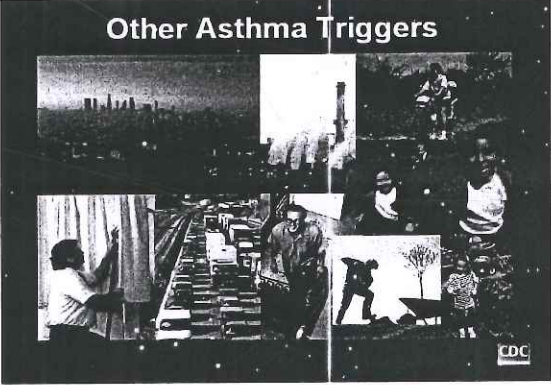
Intervention Topic	Goal	Content	First session in Medical Ward (1 hour)	Second session in OPD (1 hour)
Mastery experience, Vicarious experience, Social persuasion and emotional state	To increase self-efficacy in prevent asthma trigger	<p>Asthma is inflammatory disorder in airway that can develop become airway flow constriction and obstruction of the airway smooth muscle and swelling of the airway wall due to:</p> <ul style="list-style-type: none"> • smooth muscle hypertrophy • inflammatory cell infiltration • oedema • mucus hyper secretion <p>The characterized of asthma by episodes of wheezing, breathlessness, coughing and chest tightness</p> <p>To categorize asthma severity based on :</p> <ol style="list-style-type: none"> 1. The frequencies of symptom especially at night become worse. 2. The frequency, duration, and severity of exacerbations and their impact on activity level of patient. 3. Lung function (peak expiratory flow rate or force expiratory volume in the first second. 	<ol style="list-style-type: none"> 3. Researcher and patients discusses about asthma diseases. 4. Ask to patients, what their perception about asthma, characteristic of asthma? 5. Researcher can make summaries after discuss 6. Researcher stimulate patients to share experience in 	<ol style="list-style-type: none"> 1. Review their experience during one week they stay at home how to control asthma symptoms. 2. Ask to participant and family member what the barrier when they want to control asthma symptom during stay at home. 3. Show the picture related to succeed

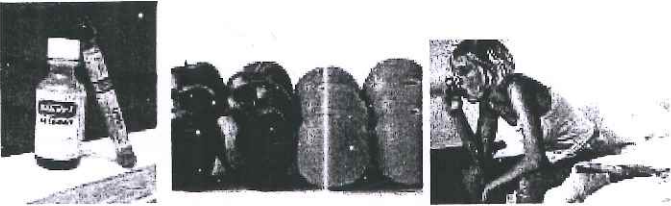
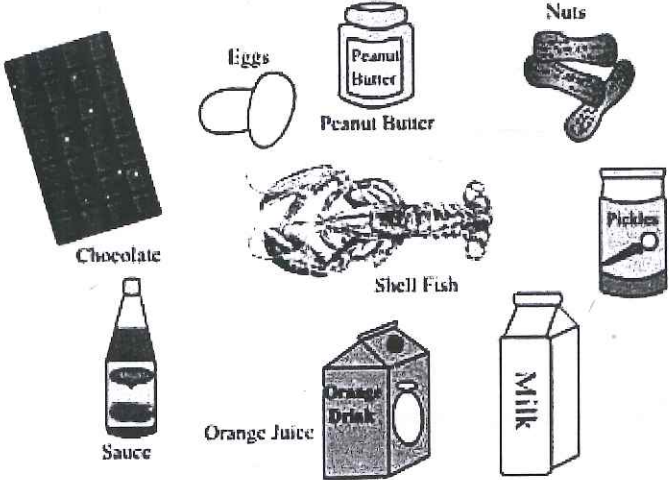
Intervention Topic	Goal	Content	First session in Medical Ward (1 hour)	Second session in OPD (1 hour)
		<p>Triggers of asthma include:</p> <ol style="list-style-type: none"> Upper respiratory infections, particularly viral, as well as bacterial infections, such as sinusitis and bronchitis  <ol style="list-style-type: none"> Allergens – these are usually caused of an immune response in allergic people. They include house dust mites, animal skin and saliva, pollen, moulds and in rare cases, foods 	<p>manage their asthma (failure and succeed experience in manage their asthma).</p> <p>7. Researcher show some picture that can induce asthma</p> <p>8. Researcher explains how to prevent asthma trigger.</p> <p>9. Explain how some factors can triggers of asthma.</p> <p>10. Change participant perception that</p>	<p>and fail to control asthma symptom and ask to them why some one can succeed or fail to control asthma symptoms.</p> <p>4. Ask to participant who are they always perform deep breathing at home. And explore what they feel after do deep breathing. Tell to</p>

Intervention Topic	Goal	Content	First session in Medical Ward (1 hour)	Second session in OPD (1 hour)
			<p>asthma can not prevent.</p> <p>11. Discuss and sharing experience between participants about their feeling after got dyspnea.</p> <p>12. Minimize anxiety level among patients and tell to them that easy to manage asthma if they have capabilities in manage asthma.</p> <p>13. Building positive thinking among</p>	<p>them to show deep breathing.</p> <p>5. Provide reinforcement positive while they can perform the good activities at home in control their asthma.</p> <p>6. Researcher make summaries after the participants provide the answering.</p> <p>7. Ask to participant</p>

Intervention Topic	Goal	Content	First session in Medical Ward (1 hour)	Second session in OPD (1 hour)
		<p>3. Physical factors such as exercise, cold air, changes in temperature and esophageal reflux</p>  <p>Exercise is good for asthma patients. Regular exercise is part of healthy lifestyle, but exercise also a common trigger for asthma</p> 	<p>asthma patients to receive the information to increase their self-efficacy.</p> <p>14. Setting the situation asthma educational program to increase team building among patients such as how they can easy to remember in prevent asthma triggers.</p> <p>15. Participants get handbook.</p>	<p>what they have to do if they will go to the place that have cold weather such go Bukittinggi (West Sumatera).</p> <p>8. Ask to participant when they have to take medicine to treat their asthma and how many they take medicine during stay at home.</p> <p>9. Repeat all</p>

Intervention Topic	Goal	Content	First session in Medical Ward (1 hour)	Second session in OPD (1 hour)
		<p data-bbox="606 295 1464 439">4. Irritants such as cigarette smoke, irritant smells (e.g. paint, cleaning agents, perfumes) and air pollution (eg. high levels of car exhaust fumes or burn forest)</p>   		<p data-bbox="1817 253 2017 571">instruction in several ways: orally, visual and demonstrate until patient can do right by self.</p> <p data-bbox="1800 599 2008 859">10. Show the picture of athma patients can control asthma symptoms.</p> <p data-bbox="1800 890 2013 1150">11. Tell to participant that we are will meet in next time in deference place</p>

Intervention Topic	Goal	Content	First session in Medical Ward (1 hour)	Second session in OPD (1 hour)
		<p data-bbox="708 235 1044 267">Other Asthma Triggers</p>  <ol style="list-style-type: none"> <li data-bbox="608 663 938 695">5. Medicines such as aspirin <li data-bbox="608 719 1144 751">6. Food additives such monosodium glutamate <li data-bbox="608 775 746 807">7. Emotion <p data-bbox="608 876 1040 908">Prevent asthma problem from exercise</p> <ol style="list-style-type: none"> <li data-bbox="608 932 1236 964">1. Identify what exercise that can induce your asthma <li data-bbox="608 988 1134 1020">2. Take your pre-treatment asthma medicine <li data-bbox="608 1044 949 1076">3. Warm up before exercise <li data-bbox="608 1100 991 1132">4. End with cool down exercise 		<p data-bbox="1815 235 2002 323">and they have to be healthier.</p>

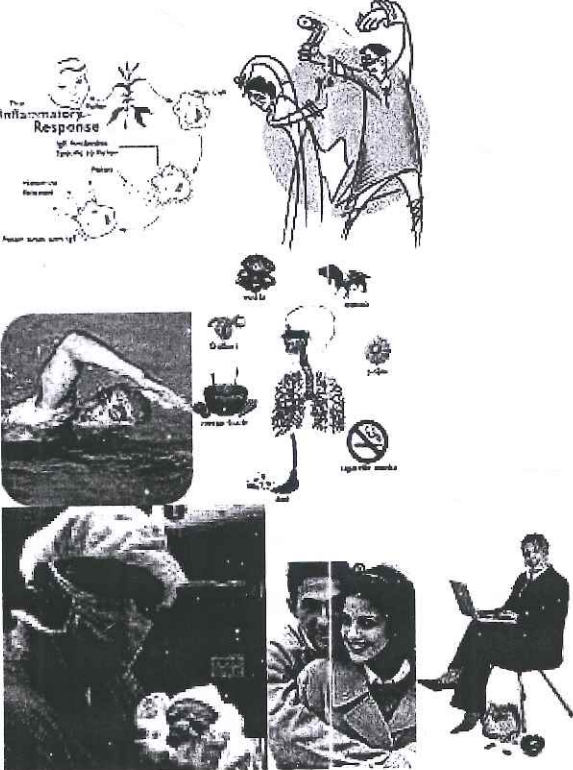
Intervention Topic	Goal	Content	First session in Medical Ward (1 hour)	Second session in OPD (1 hour)
		 <p data-bbox="676 543 1261 599"><i>Certain Foods can trigger Asthma episodes in a few patients. For Example</i></p> 		

Intervention Topic	Goal	Content	First session in Medical Ward (1 hour)	Second session in OPD (1 hour)
		Provide the solution to prevent asthma trigger : <ol style="list-style-type: none"> 1. Limit scuffed animal in room and wash them weekly 2. Clean the room from dust by washing the bed pillow, sheets and cover every week 3. Keep pets away from carpet and upholds altered furniture 4. Keep food in tight containers 5. Repair water lack 6. Use traps and poison baits to control cockroaches. If spraying is necessary , you have to leave the home until the odor cleared 		
Mastery experience, Vicarious experience, Social persuasion and emotional	To increase self-efficacy in control asthma symptoms	Sign and symptom of asthma <ol style="list-style-type: none"> 1. Coughing associated with asthma generally worsens at night and early in the morning, making sleeping difficult. 2. Chest tightness is a squeezing feeling in the chest during respiration. 3. Shortness of breath is used to describe a feeling of breathlessness a feeling that cannot catch breath 4. Rapid breathing is a common asthma symptom. When breathlessness 	<ol style="list-style-type: none"> 1. Researcher and participant discuss about sign and symptom of asthma 2. Ask to participant what they have 	<ol style="list-style-type: none"> 1. Ask to participant what the barrier they know to use inhaler from the slide. 2. Evaluate their

Intervention Topic	Goal	Content	Ward (1 hour)	OPD (1 hour)
state		<p>occurs, people with asthma may try to breathe faster to try to get air in and out of lungs</p> <p>Respiratory system divided in 2 parts.</p> <ol style="list-style-type: none"> 1. Upper respiratory is nasal, larynx and pharynx. 2. Trachea, bronchus and bronchioles and alveoli <p>The respiratory system is made up of nose and mouth, windpipe, lungs and air tubes that connect to nose and mouth with lungs.</p> <p>Pathogenesis of asthma :</p> <ol style="list-style-type: none"> 1. The airways of individuals with asthma are extremely sensitive to allergens and irritants that are in the environment. When allergens or irritants are present, the lining of the airways become inflamed (Bronchial tubes), swell and, subsequently, narrow. 2. The muscles of the bronchial walls tighten, and the cells in the lungs, 	<p>sign and symptom before admitted in the ward.</p> <ol style="list-style-type: none"> 3. Ask to participant what they feel when asthma occur. 4. Provide reinforcement when they can perform the right answer. 5. Researcher makes summaries after discuss and 	<p>capability to use inhaler.</p> <ol style="list-style-type: none"> 3. Ask to participant who can perform using inhaler. 4. Provide the reinforcement when they can perform in the right technique. 5. Researcher make summaries after participant perform the answering and

Intervention Topic	Goal	Content	First session in Medical Ward (1 hour)	Second session in OPD (1 hour)
		<p>produce extra mucus, which further narrows the airway. This can cause minor wheezing to severe difficulty in breathing.</p> <p>3. Attacks or recurrent attacks of wheezing, Trouble some coughing at night, wheezing or coughing after exercise, talking for prolonged periods or laughing, wheezing, chest tightness, or coughing after exposure to airborne allergens or pollutants (e.g. animals, pollen, smoke, and dust)</p> <p>Provide information to patient what they have to do if they will go or they near high risk to get asthma attack.</p> <ol style="list-style-type: none"> 1. They have to bring the medication 2. Don't drink the cold water/ Es (drink warm water) 3. Use the shawl to prevent cold weather 4. Use marker if air pollution occurs or when infection upper respiratory tract have. 5. Bring the mantel 	<p>explain more that they did not understand.</p> <p>6. Explain about physiology of respiratory tract.</p> <p>7. Researcher provide information about pathogenesis of asthma</p> <p>8. Participant get handbook and material</p> <p>9. Show the picture respiratory tract,</p>	<p>explain more about inhaler benefit and technique to use.</p>



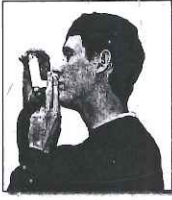
Intervention Topic	Goal	Content	First session in Medical Ward (1 hour)	Second session in OPD (1 hour)
			<p>physiology of respiratory and respiratory tract in patient with asthma and show the kind equipment that commonly asthma patients need.</p> <p>10. Tell to family member that their support is importance role in encouraging the patients to</p>	



Intervention Topic	Goal	Content	First session in Medical Ward (1 hour)	Second session in OPD (1 hour)
			<p>engage in manage their asthma.</p> <ol style="list-style-type: none"> 11. Answer the family member's question 12. Teaching and discussion with family members is given information at the same time with the patients. 13. Tell to them that asthma can be controlled. 14. Explain and 	

Intervention Topic	Goal	Content	First session in Medical Ward (1 hour)	Second session in OPD (1 hour)
		<p>The benefit of asthma management is</p> <ul style="list-style-type: none"> - Maintain normal activity levels (including exercise). - Maintain (near) normal pulmonary function rates. - Prevent chronic and troublesome symptoms control symptoms; prevent acute asthma (e.g., coughing or breathlessness at night, in the early Morning, or after exertion). - Prevent recurrent episodes of asthma (e.g., no hospitalizations or emergency department visits). - Avoid adverse effects from asthma medications. - Anticipatory or early treatment of symptoms is important to reduce the likelihood of developing severe airway narrowing. 	<p>demonstration to do deep breathing.</p> <p>15. Explain to participant what the function all of the equipment for asthma patients.</p>	
<p>Mastery experience, Vicarious experience,</p>	<p>To increase self-efficacy in using inhaler</p>	<p>The benefit of inhaler for asthma patient is :</p> <ol style="list-style-type: none"> 1. Prevented medications and other drugs used to control persistent asthma symptoms 2. Reliever medications to treat symptoms of an asthma attack 	<p>1.Explain about asthma medication and discuss to patient what they feel after take of</p>	<p>6.</p>

Intervention Topic	Goal	Content	First session in Medical Ward (1 hour)	Second session in OPD (1 hour)
Social persuasion and emotional state		<p>The step to use inhaler</p> <ol style="list-style-type: none"> 1. The sufferer should make sure that the medication canister is attached to the plastic inhaler and shake well or, if using a dry powder inhaler system (DPI), load the medication disk according to the manufacture's instruction. 2. If recommended, a spacer should be attached to the metered dosed inhaler (MDI). 3. The patient has to breathe out through the mouth while sitting upright or standing. 4. If a spacer is not used, the open mouth method is better with an MDI. The instructions normally given are: <ul style="list-style-type: none"> - Hold the inhaler up to 2 inches away from your open mouth. - While starting to inhale through your open mouth, use your index finger to press down firmly on the top of the canister. - Continue to inhale for 3 to 5 seconds to obtain a full breath, and then try to hold your breath for 5 to 10 seconds. 5. If the closed mouth method is used (as recommended for DPI systems) the 	<p>medication when dyspnea occurs.</p> <ol style="list-style-type: none"> 2. Researcher asks to participant about their ability to use inhaler. 3. Researcher provides information about the benefit of inhaler for asthma patient. 4. Researcher explain how to use inhaler and explain why very importance to know how to use inhaler. 5. Show picture to use inhaler with the right 	

Intervention Topic	Goal	Content	First session in Medical Ward (1 hour)	Second session in OPD (1 hour)
		<p>following instructions are given:</p> <ul style="list-style-type: none"> - Place the mouthpiece of the inhaler in your mouth and close the lips tightly around it. - While starting to inhale, use your index finger to press down firmly on the top of the canister. - Continue to inhale for 3 to 5 seconds to obtain a full breath, and then hold your breath for 5 to 10 seconds. - Remove the inhaler from your mouth before you exhale and breathe normally. - If more than one inhalation is prescribed, the patient is told to wait at list 30 seconds before taking another inhalation, then to repeat step 1 to 5. - The mouthpiece cap is replaced after each use. <p>6. Patients are told to clean the inhaler thoroughly and frequently. The metal canister has to be removed and the inhaler and cap cleaned at least once</p>	<p>technique and the wrong technique.</p> <p>6. Motivate the patient to carry out their knowledge in to practice to manage their asthma.</p> <p>7. Help participant to re-demonstrate to use inhaler.</p> <p>8. Suggest to participant to see the step to use inhaler in handbook</p> <p>9. Help the participant to easier remember what the step to use inhaler.</p>	

Intervention Topic	Goal	Content	First session in Medical Ward (1 hour)	Second session in OPD (1 hour)
		<p>per day by rinsing with warm, running water. The inhaler is dried and capped thoroughly with a gentle twisting motion.</p> <p>7. The canister must be discarded after the number of inhalations indicated has been taken. It should not be used beyond this indicated number because the correct dose amount can no longer be guaranteed.</p> <p>For dry powdered inhalers, forceful, rapid inhalation should be used with a closed mouth technique. Patients must read the instructions provided by the manufacturer of the device used.</p> <div style="display: flex; justify-content: space-around; align-items: center; margin-top: 20px;">    </div> <div style="display: flex; justify-content: space-around; align-items: center; margin-top: 5px;"> #ADAM #ADAM #ADAM </div>	<p>10. Instruction the participant to practice to use inhaler until right and tell to them don't afraid to try.</p> <p>11. Tell to participant they can help their friend to measure how many step their friend is correctly in use inhaler.</p> <p>12. Tell to participant the best teacher is learning from mistake.</p>	

Intervention Topic	Goal	Content	First session in Medical Ward (1 hour)	Second session in OPD (1 hour)
		 <p data-bbox="846 431 910 449">#ADAM.</p> <p data-bbox="1151 424 1278 442">#ADAM. MADA#</p> 	<p data-bbox="1502 211 1779 526">13. Facilitate that patient difficult to do demonstration to use inhaler. Arrange the good position to use inhaler.</p> <p data-bbox="1502 561 1768 876">14. Spent time to enhance their skill. Stay beside participant when they try to use inhaler</p> <p data-bbox="1502 911 1789 1114">15. Provide handbook for review at home to make easier to remember what they</p>	

Intervention Topic	Goal	Content	First session in Medical Ward (1 hour)	Second session in OPD (1 hour)
			<p>have to do with their asthma.</p> <p>16. Provide the answering the question by warm environments such as speak with friendly and smile.</p> <p>17. Ask to patients, do they need information to manage their asthma?</p>	

Appendix B

Informed Consent Form

Dear participants

My name is Siti Rahmalia Hairani Damanik, I am nursing educator in the MIPA Faculty, Riau University, Pekanbaru, Indonesia. Now, I am a Master student of Nursing Science in Prince of Songkla University, Thailand. I am conducting a nursing research project to study effect of asthma educational program on self-efficacy in skill management of. The study will increase your self confidence to manage your asthma. If you will agree to participate, you will be asked to complete the questioner of the demographic, and asthma questionnaire. It will take time around 60 minutes to complete questionnaires (pre and post asthma educational program and you will have to attend to two sessions in this program). The first session will be conducted in Medical ward and the second session will be conducted in pulmonary clinic. Please do not hesitate to ask me if you find any difficulties in understanding items of questionnaires.

This study will create a minimum harm to you and your family. Your personal identity and the information gathered will not be revealed and remain confidential. During the processes, you have a right to withdraw from the study at any time without any effect on the treatment or nursing care for you. Your signature on this form will indicate that you understand this form and are willing to participate in this study. Thank you for your cooperation.

.....
Name of Participant Signature Date

.....
Name of Researcher Signature Date

If you have any question or need more information, please fill free to contact me on the following addresses: Nursing Program, MIPA Faculty- Riau University, Pekanbaru, Indonesia,JI. Diponegoro No. 8, Phone/Fax (+62-761-31162), e-mail : lia_dmk@yahoo.com, or you can also contact my thesis advisor Assist. Prof.Dr. Ploenpit Thaniwathananon at Faculty of Nursing, Prince of Songkla University, Hat Yai Songkla, Thailand 90112.

Appendix C

Instruments

Code :

Date/ Time :

Introduction:

The instrument was divided into 2 parts. Part 1 was related to demographic data and health information, and part 2 was related to self- efficacy in skill management of asthma.

Part 1: Demographic and health information

1. Age : years old
2. Gender : (1) Male (2) Female
3. Religion :
4. Marital Status : (1) Single (2) Married (5) Separated
 (3) Widowed (4) Divorced
5. Occupation : (1) None (2) Retirement
 (3) Farmer (4) Businessman
 (5) Private employ (6) Government employ
6. Education level : (1) Elementary (2) Junior School
 (3) High School (4) Diploma
 (5) Degree
7. Monthly Income : (1) Rp. <500, 000 (2) Rp.500, 000-<1.000, 000
 (3) Rp.1.000, 000-<2.000, 000
 (4) Rp.2.000, 000-<3.000, 000
 (5) Rp.>3.000, 000
8. Living with :
9. Underlying Disease :
10. Type of Medication :
11. Duration of Illness :

Part 2: Self-Efficacy Asthma questionnaire

Please check (V) in the appropriate column based on your perception

There are five options available: VC: Very confident, PC: Pretty confident, SC: Somewhat confident, NVC: Not very confident, and NAC: Not at all confident.

7	I can prevent upper respiratory infection that can trigger my asthma					
9	Once an attack starts, I am not capable of stopping it : I just have to wait until it subsides					
11	While asthma attack , I can lie down or sit a comfortable on the chair, good posture to a great deal to solve the problems					
12	While asthma attack, I can inhale deeply and slowly through my nose , and exhale through my mouth					
15	I can place the mouthpiece of the inhaler in my mouth and close my lips tightly around it					
18	I can remove my mouth before exhale and breath normally					
19	I have more confidence when I have to repeat the puffs as prescribed					
20	I can wait at list 30 second before taking another inhalation					

Appendix D

Sample size calculation

The sample size of this study will calculate by the formula power analysis of variance as follow (Cohen, 1988).

$$\text{Effect size} = \frac{\overline{X}_1 - \overline{X}_2}{\text{PooledSD}}$$

$$\text{Pooled} = \sqrt{\frac{(SD_1)^2 + (SD_2)^2}{2}}$$

Where X_1 : Mean of experiment group

X_2 : Mean of control group

Pooled SD: Standard deviation of the control group, and experiment group.

Based on the previous study (Kara & Turkinaz, 2003), they studied about effect of education on self-efficacy of Turkish patients with chronic obstructive pulmonary disease. They found that the mean of the experiment group was 3.50, mean of the control group was 2.76, standard deviation of the experiment group was 0.44 and control group was 0.35. After calculating based on formula Cohen (1998) found that pooled standard deviation of the experiment and control group is 0.588 and the effect size is 1.57. According to Kara and Turkinaz (2003), the power size is greater than 95 and $P; 0.001$, so the researcher need 25 samples per each group with power size is 0.99.

$$ES = \frac{3.50 - 2.76}{\text{Pooled}}$$

$$\text{Pooled} = \sqrt{\frac{(0.44)^2 + (0.50)^2}{2}} = \sqrt{0.42} = 0.588$$

$$ES = \frac{3.50 - 2.76}{0.588} = \frac{0.74}{0.588} = 1.57$$

Appendix E

List of Expert for Content Validity of Questionnaire and Asthma Educational Program

1. Dr.Hatairat Sangchan
Department of Surgical Nursing, Faculty of Nursing-Prince of Songkla University,
Thailand
2. Dr.Azizman Saad Sp.P
Department of Medical Doctor, Arifin Ahmad Hospital Pekanbaru,Indonesia
3. Imalia Dewi Asih, MSN
Department of Medical Nursing, Faculty of Nursing-Riau University, Indonesia

Appendix F

Pre-test and post-test self-efficacy in skill management of asthma score

Table 8

Mean score and standard deviation of pre and post test self-efficacy in skill management of asthma

Question	Experimental group				Control group			
	Pre-test		Post-test		Pre-test		Post-test	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
I can detect my asthma triggers before being attacked	1.64	.56	2.96	1.09	1.68	.56	1.76	.52
I can prevent asthma in almost all situation	2.08	.57	3.56	1.19	2.08	.57	2.08	.57
I can avoid or minimize most of my asthma triggers	1.92	.75	3.32	1.11	2.00	.76	2.00	.76
If cigarette smoke is bothering me, I feel that I can ask the person to stop smoking	2.00	.95	3.44	1.26	2.04	.93	2.04	.93
I can identify what exercise that can induce my asthma	1.72	.61	3.96	4.48	1.76	.59	1.76	.60
I can avoid the allergen that can induce my asthma	1.74	.63	3.56	1.33	1.76	.59	1.76	.60
I can prevent upper respiratory infection that can trigger my asthma	2.30	.79	3.68	1.25	2.28	.79	2.32	.75

Table 7 (continued)

Question	Experimental group				Control group			
	Pre-test		Post-test		Pre-test		Post-test	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
During an asthma episode, I can refrain from panicking in order to better manage the attack	2.00	.00	2.52	.86	2	.00	2.00	.00
Once an attack starts, I am not capable of stopping it : I just have to wait until it subsides	2.06	.54	2.60	1.07	2.04	.54	2.04	.54
I don't have barrier to do deep breathing to control my asthma symptoms	1.90	..42	2.58	1.13	1.93	.40	1.92	.40
While asthma attack , I can lie down or sit a comfortable on the chair, good posture to a great deal to solve the problems	1.80	.40	2.40	1.05	1.84	.37	1.80	.41
While asthma attack, I can inhale deeply and slowly through my nose , and exhale through my mouth	1.98	.14	2.72	1.14	2.00	.00	2.00	.00

Table 7 (continued)

Question	Experimental group				Control group			
	Pre-test		Post-test		Pre-test		Post-test	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
While asthma attacks, I can relax by slow and deep breaths	2.04	.28	2.78	1.18	2.00	.29	2.00	.29
I have confidence to perform the correctly position to use inhaler (sitting upright or standing)	1.58	.54	3.24	.83	1.60	.50	1.60	.50
I can place the mouthpiece of the inhaler in my mouth and close my lips tightly around it	1.52	.50	3.08	.70	1.56	.51	1.56	.51
I can start to inhale , while I press down firmly on the top of the canister	1.60	.49	3.20	..76	1.64	.49	1.76	.44
I can full breath for 3-5 second and hold my breath for 5-10 second to release the medication	1.68	.47	3.123	.78	1.72	.46	1.80	.41
I can remove my mouth before exhale and breath normally	1.74	.53	3.12	.73	1.76	.52	1.92	.40

Table 7 (continued)

Question	Experimental group				Control group			
	Pre-test		Post-test		Pre-test		Post-test	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
I have more confidence when I have to repeat the puffs as prescribed	1.48	.50	2.38	.78	1.52	.51	1.84	.37
I can wait at list 30 second before taking another inhalation	1.66	.56	2.62	.92	1.72	.54	2.00	.29

VITAE

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Educational Attainment

Degree	Name of Institution	Year of Graduation
Bachelor of Nursing	Faculty of Nursing, Indonesia University	2001

Scholarship Awards during Enrolment

2007-2009 Master scholarship, Faculty of Nursing, Riau University and funded by Government Republic of Indonesia.

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