

# Effectiveness of a Self-Management Enhancement Program Among Adults with Uncontrolled Asthma: A Randomized Controlled Trial

*Pornthip Kaewsing, Darawan Thapinta,\* Jindarat Chaiard, Chomphoonut Srirat*

**Abstract:** People with uncontrolled asthma are faced with many difficulties as the disease progresses and self-management is one approach to improve their health outcomes. This randomized controlled trial aimed to test the effects of a self-management enhancement program on symptom control and quality of life among adults with uncontrolled asthma. The study was implemented from April to September 2018 at a tertiary care hospital in northeast Thailand. One hundred people were randomly assigned to the experimental (n = 50) and control groups (n = 50). The experimental group participated in a 6-week self-management enhancement program, whereas the control group received standard care. The outcomes were assessed at 12 weeks after the completion of the program. Questionnaires used were the Asthma Control Test and the Mini Asthma Quality of Life. Data were analyzed using descriptive statistics, paired t-tests, independent t-tests, and Mann-Whitney U tests.

The results indicated that participants in the experimental group showed improvements in symptom control, as well as their quality of life, compared to before the program. After the program, they had a statistically significant better improvement in symptom control and quality of life when compared with the control group at 12 weeks. These findings suggest that the program for self-management can be used to improve symptom control and the quality of life among persons with uncontrolled asthma, but we suggest further testing with groups in other regions. Such an intervention could be directly beneficial to either nurses or other health care professionals to enhance health behaviors among people with uncontrolled asthma. Nurses need to be trained to provide information and motivate people with uncontrolled asthma to sustain their self-management efforts.

*Pacific Rim Int J Nurs Res 2021; 25(3) 375-388*

**Keywords:** Quality of life, Randomized controlled trial, Self-management, Symptom control, Uncontrolled asthma

Received 5 September 2020; Revised 29 December 2020; Accepted 21 March 2021

## Introduction

Asthma is a common chronic respiratory problem that has significant impacts on both individuals and health care systems.<sup>1</sup> The number of asthma cases throughout the world is rising, with about 334 million new diagnoses and 250,000 deaths annually.<sup>2,3</sup> Four common symptoms of asthma are wheezing, shortness

*Pornthip Kaewsing, RN, PhD (Candidate), Faculty of Nursing, Chiang Mai University, Thailand. E-mail: taro.12345@hotmail.com; Pornthip.kae@bcnsp.ac.th*  
*Correspondence to: Darawan Thapinta,\* RN, PhD, Professor, Faculty of Nursing, Chiang Mai University, Thailand. E-mail: darawan1955@gmail.com*  
*Jindarat Chaiard, RN, PhD, Assistant Professor, Faculty of Nursing, Chiang Mai University, Thailand. E-mail: darachai@yahoo.com*  
*Chomphoonut Srirat, RN, PhD, Assistant Professor, Faculty of Nursing, Chiang Mai University, Thailand. E-mail: chomphoonut.s@cmu.ac.th*

of breath, chest tightness, and coughing, which can vary over time and in intensity. Control of these four symptoms is very important to maintaining the health

and quality of life (QOL) of people with asthma. However, 34.7% of people with asthma still cannot control the symptoms, and 21.7% are admitted to the emergency room with a severe asthma attack.<sup>3</sup> People with uncontrolled asthma often do not have proper self-management behaviors, e.g. incorrect use of inhalers, lack of knowledge and skills to recognize and manage asthma symptoms, and often are unaware and unable to recognize and avoid exacerbating agents.<sup>4</sup>

Because of the complex causes and pathophysiology of asthma, controlling the disease requires the intrinsic motivation of the people with asthma to continually engage in self-management (SM). Various intervention programs have been developed to control asthma symptoms. Among these was a SM program which was found to contribute to better patient outcomes (e.g., confidence in the management of asthma, better QOL, fewer hospitalizations,<sup>5</sup> fewer unscheduled visits to physicians,<sup>6,7</sup> and decreased absenteeism from school or work).<sup>8,9</sup> The results showed asthma-related QOL was improved at 3-months after the theory-based interventions.<sup>10</sup> The long-term goals of asthma SM were to control asthma symptoms, improve pulmonary function,<sup>11</sup> and increase QOL.<sup>12</sup> However, the effects were short, only lasting 3-9 months, and after that patients were once again unable to control their symptoms.<sup>13-16</sup>

Sustainable SM efforts require intrinsic motivation, and it is a challenging issue for both asthmatics and health care providers. A higher level of intrinsic motivation is reflected in one's perceptions of autonomy, competence, and relatedness to carry out self-care tasks.<sup>17,18</sup> To be successful in sustaining SM, all these perceptions should be cultivated throughout a program. Thus, this study sought to determine whether a SM program integrated with intrinsic motivation would be effective for symptom control and increasing QOL among people with uncontrolled asthma 12 weeks after completion of the 6-week program.

## **Literature Review and Theoretical Framework**

Asthma is a disease caused by chronic inflammation of the pharynx. It is characterized clinically by bronchial sensitivity where a contraction of the bronchial passages causes stenosis or narrowing and by recurrent attacks of breathlessness and wheezing, which vary in severity and frequency from person to person. In an individual, they may occur from hour-to-hour and day-to-day.<sup>2</sup> The pathogenesis of asthma is from the combination of genetic and environmental factors, such as allergens leading to the inflammation process. The cytokines from T-lymphocytes cause airflow obstruction from chronic inflammation and secretion production.<sup>19</sup> Patients will cough and have dyspnea during the bronchoconstriction. If they are not treated properly, the chronic condition will lead to fibrosis and a thickening of the trachea. This is called airway re-modeling and the effect of this is permanent airway obstruction.<sup>1</sup>

Symptom control is the goal of treatment, and this is the degree to which the effects of asthma can be observed in the patient, or that they have been eased or eliminated by treatment. Achieving and maintaining asthma control requires four components of care 1) assessment and monitoring, 2) education for a partnership in care, 3) control of environmental factors, and 4) control of comorbid conditions that affect asthma and medications. Control of asthma aims to reduce impairment, including preventing chronic and troublesome symptoms (e.g. coughing or breathlessness in the daytime, at night, or after exertion), requiring infrequent use ( $\leq 2$  days a week) of inhaled short-acting beta-agonists (SABA) for quick relief of symptoms to maintain (near) normal pulmonary function, normal activity levels (including exercise, other physical activity, and attendance at school or work), and meeting patients' and families' expectations of, and satisfaction with, asthma care.<sup>20</sup>

Asthma is treated with two types of medicines: long-term control and quick-relief medicines. Long-term control medicines help reduce airway inflammation and prevent asthma symptoms. Quick-relief, or “rescue,” medicines relieve asthma symptoms and are used to reverse bronchodilation in acute asthma attacks.<sup>20</sup> Another treatment is non-pharmacological asthma treatment, which aims to improve asthma control or prevent the disease entirely. It includes environment management, physical exercise, breathing exercises, smoking cessation, influenza vaccines, weight reduction, and the management of anxiety and depression.<sup>21</sup> In general, guidelines for the treatment of asthma for asthmatic patients in hospitals have been implemented through an Easy Asthma Clinic (EACC). Such guidelines, the so-called Global Initiative for Asthma (GINA), was adopted worldwide. In practice, Thailand has utilized these guidelines for the implementation of medical therapies and choosing suitable inhaler devices. The guidelines include techniques that formulate a course of treatment that is effective and comprehensive. Optimal management of patients with difficult asthma is reliant upon rigorous, systematic multi-disciplinary assessment. Nonetheless, the GINA provides an effective and comprehensive guideline for the treatment of people with asthma.<sup>2,21</sup>

The increased frequency of inpatient admissions with asthma indicates the significance of the disease being uncontrollable as judged by an asthma control test (ACT) score <19.<sup>19</sup> Uncontrolled symptoms include shortness of breath, chest tightness, and cough,<sup>22</sup> which causes more hospitalizations and emergency room visits than for those with controlled asthma<sup>23</sup> and they tend to have a worse QOL.<sup>24</sup>

QOL is defined as the perceived well-being of life caused by the feelings of satisfaction or dissatisfaction of the individual about components of their life.<sup>24</sup> QOL is important for people with asthma to better evaluate their functional status and symptoms since their QOL is not as good when they are unable to maintain their physical function or experience limitations in their daily and social activities.<sup>10,12,23</sup>

One prevention measure for uncontrollable asthmatic disease is SM. This can enhance symptom control, reduce the impact of asthma on related morbidity, functional, and behavioral issues and the improved ability to monitor one's condition affecting cognitive functions and enhance one's QOL.<sup>9,10,11,14</sup> Further, SM can help people with uncontrolled asthma develop skills to attain realistic and attainable goals for managing their asthma. Lorig<sup>27</sup> defined SM as learning the knowledge and practical skills necessary for living with quality and enjoyment, despite having a chronic illness. SM is not an alternative to medical treatment, but it allows the patient to form a partnership with their health care providers. This involves people taking responsibility for their health and wellbeing, as well as learning to manage any incurable long-term illnesses. SM is a process used to control one's day to day behavior and develop the skills necessary to maintain acceptable levels of psychosocial functioning and suitable QOL.<sup>8</sup> It aims to enhance the learning process related to the patients' behavioral modification to achieve sustainable health outcomes. Lorig and Holman<sup>7</sup> described six core SM skills that should underpin any chronic disease SM program; problem-solving, decision-making, resource utilization, collaboration, self-tailoring and taking action. Moreover, these skills involve patients addressing three tasks, including medical, emotional, and role management, which indicate their ability to control an existing chronic disease and its consequences.<sup>25</sup>

In the literature, there are six studies with different approaches to SM. The first two were based on Kanfer's SM model.<sup>26</sup> Three studies recommended the effectiveness of SM in improving asthma control,<sup>27-29</sup> while three studies recommended the effectiveness of SM behavior in improving disease control in general.<sup>30-32</sup> These six studies only looked at SM in general and the suggestions are not specifically about asthma-related SM programs and are focused on applying self-determination approaches about processes that help a person acquire the motivation for initiating

new health-related behaviors and maintaining them over time.<sup>18</sup> Self-determination is a process of internalization and integration which creates a sense of autonomy, competence, and relatedness. Intrinsic motivation could enable participants to play an active role in their health care, leading to improvements in health behaviors and increasing satisfaction with health care provider-participant communication. Thus, when patients have a higher level of intrinsic motivation, it is reflected in their perceptions of autonomy, competence, and relatedness to carry out self-care tasks, and to them being better able to carry out SM practices. Therefore, the methods currently used to promote these outcomes may not be sufficient. Thus, the integration of both SM and self-determination are essential for ensuring effective SM interest to use in enhancement training.<sup>17</sup>

In summary, SM helps patients with uncontrolled asthma symptoms decrease exacerbation of symptoms and reduce the frequency of revisiting the emergency room. Also, the long-term goals of asthma SM are controlling asthma symptoms, improving pulmonary function,<sup>11</sup> and increasing QOL.<sup>12</sup> To date, in Thailand, there is no SM program for asthma in which self-determination is included to enhance health behaviors, improve symptom control, and increase the QOL of persons with uncontrolled asthma. Therefore, this study incorporated self-determination in SM for this is necessary to extend the body of knowledge and fill the gap in knowledge about SM in persons with uncontrolled asthma.

#### **Aims and Hypotheses**

The aims of this study were to; 1) compare symptom control and the QOL of people with uncontrolled asthma before and after 12 weeks of receiving the 6-week self-management enhancement program (SMEP) and 2) compare symptom control and QOL between participants in the experimental and the control group at 12 weeks after completion of the program.

The following hypotheses were investigated: 1) participants in the experimental group would have higher scores for symptom control and higher QOL at

12 weeks after the completion of the 6-week SMEP program than before participating in the program.

2) the participants in the experimental group would have higher mean scores for symptom control and QOL than those in the control group at 12 weeks after completion of the program

## **Methods**

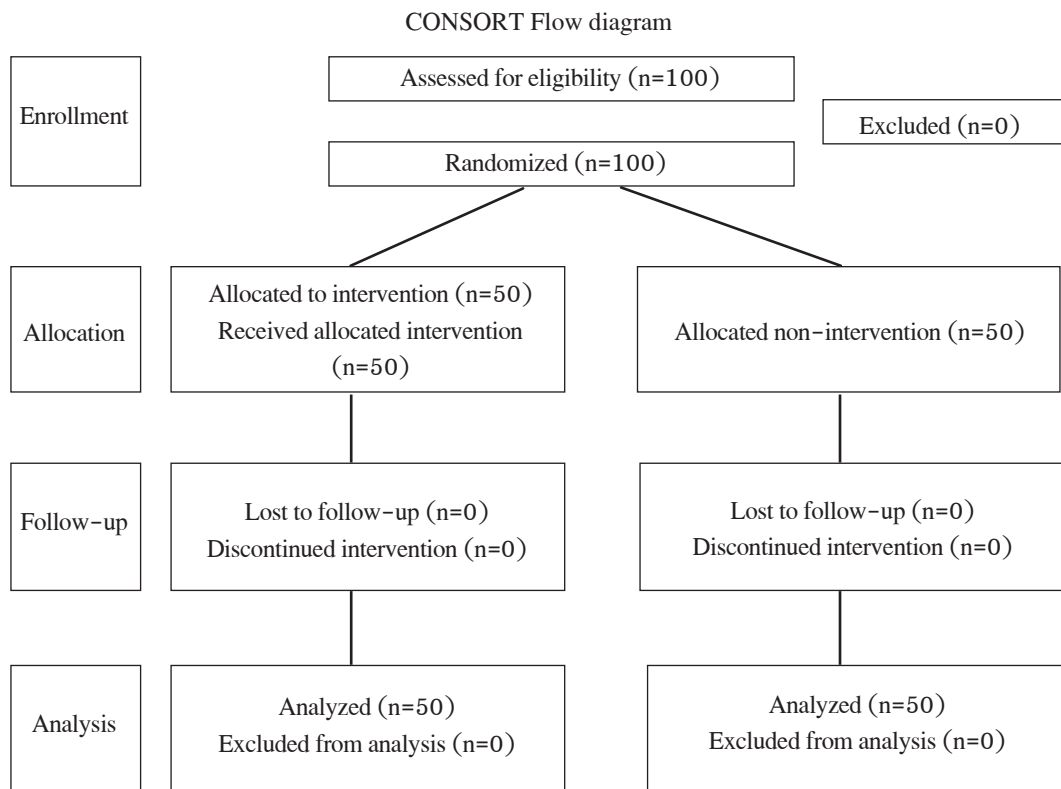
**Design:** This study used a single-blind randomized controlled trial (RCT) approach.

**Sample and Setting:** The sample consisted of known cases of uncontrolled asthma visiting an out-patient clinic at a tertiary care hospital in north-eastern Thailand. Diagnosis of people with uncontrolled asthma was done by a physician following the standards of the GINA.<sup>2</sup> Inclusion criteria included participants 1) age 18–59 years; 2) being diagnosed as asthmatic by a physician for a minimum of six months; 3) receiving treatments with inhalation of short-acting bronchodilators, corticosteroids, and other controlled medications for a minimum of six months; 4) no respiratory comorbidities (i.e., chronic obstructive pulmonary disease, lung); 5) uncontrolled asthma diagnosed by doctors as shown in **Table 1**; 6) ACT score of below 19; and 7) able to read and write in Thai. Exclusion criteria included participating in another SM program, and having any medical problems related to their coronary system.

The sample size was estimated using power analysis to reduce the risk of a type II error and was determined based on the criteria for the significance level of .05, power of .80, and effect size of 0.6. The sample size assessed by the power table was 44 participants in each group. The effects of participants dropping out of the study were minimized by adding 10% or 6 cases to this number; therefore, the sample was increased in size to 50 participants in each group. Random assignment was used to assign participants to the experimental or the control group using permuted-block randomization using a block size of 6. The flow of participants is shown in **Figure 1**.

**Table 1** Guideline of diagnosis asthma

Health History	Having respiratory symptoms such as wheezing, shortness of breath, chest tightness, and cough.
Physical examination	1) hyper-expansion of the thorax, use of accessory muscles, the appearance of hunched shoulders and chest deformity 2) sounds of wheezing during normal breathing, or prolonged phase of forced exhalation and 3) increased nasal secretion, mucosal swelling, and/or nasal polyps.
Pulmonary function test (PFT), peak-flow meters, and the bronchial challenge test.	<p>PFT: FEV<sub>1</sub>/FVC ratio is below 0.70.</p> <p>Peak-flow meters: values of between 80% and 120% of the average value are considered normal.</p> <p>Bronchial challenge test: methacholine challenge test and exercise challenge test. The patients will show the same symptoms as ordinary asthma-like tiredness, chest pain, wheezing, and coughing 5-10 minutes after exercising, and will disappear within 30-45 minutes.</p>



**Figure 1.** The study flow of participants through each stage of a randomized controlled trial

**Research Instruments:** These were:

A *demographic data questionnaire*, designed to collect participant data (age, gender, marital status etc.) smoking, alcohol consumption, duration of asthma diagnosis, participation in asthma education courses, number of ER visits, number of hospitalizations, number of acute exacerbations, and number of incidences of leaving work.

*Asthma Control Test (ACT)* which is a tool for measuring the frequency of bronchodilator use, the rate of relapse, and the impact of the disease on daily activities, developed by Nathan et al.<sup>33</sup> and translated into Thai by Vongsa et al.<sup>34</sup> The ACT requires the individuals to recall relevant information related to the past 4 weeks of asthma symptoms, as well as their status. The ACT is a 5-item questionnaire with a score ranging from 5 (poor control to 25 complete control of asthma). Higher scores reflect greater asthma control, with scores of 21–25 classified as well-controlled asthma; 16–20 as not well-controlled asthma; and 5–15 as very poorly controlled asthma. The Cronbach alpha reliability of this study was 0.89.

*Mini Asthma Quality of Life Questionnaire (MiniAQLQ)*. This was developed by Juniper<sup>35</sup> and translated into Thai by Leurmankul,<sup>36</sup> and is a measurement of QOL among asthma patients. The MiniAQLQ (S)

consists of 15 questions related to asthma, with four dimensions: 1) activity limitation– 4 items, 2) symptoms–5 items, 3) emotional function– 3 items, and 4) exposure to environmental stimuli– 3 items. For activity limitation, the items ask about asthma symptoms occurring within the past two weeks, with a rating scale from 1 (severe restrictions or ongoing at any time) to 7 (no restrictions or without an incidence). For the rest, the items asked the presence of problem ranging from 1 = presence to 7 = not presence. The total score ranges from 15–105, with a higher score indicating higher QOL. An item example of activity limitation is “activities related to work.” The Cronbach alpha reliability of this study was 0.92.

*Self-management Enhancement Program (SMEP)*: The SM education as proposed by Lorig and Holman<sup>7</sup> was used to guide the intervention, incorporated with SDT.<sup>6</sup> SM focuses on three tasks and six skills incorporated with SDT, which include intrinsic motivation (autonomy, competence, and relatedness). The program focused on giving the participants information about asthma and training related to the six skills of SM and intrinsic motivation. There were six sessions, each lasting for 2.15 hours over six weeks. The programs and activities included in the SMEP are described in **Table 2**.

**Table 2** Program and activities of the integrated SMEP

Week/session	Objectives	Content and Activities
Week 1: Session 1 :90 minutes (There are 3 breaks during activity, done with 15 minutes per time every week.)	Increasing knowledge and understanding, and formulating a personal action plan	Program introduction, health education, health problems identification, SM concept, and intrinsic motivation were provided using videos, flip charts, and flip picture presentations.
Week 2: Session 2 : 90 minutes : Skills training (40 minutes) : Group-based discussion (50 minutes)	Developing and improving SM skills and intrinsic motivation.	Skills training (problem-solving and decision making) through group-based discussion. Integration of intrinsic motivation (autonomy and relatedness) by making their own choices for suitable behavior and sharing health data. Participants assigned to continue practicing as specified in their action plans.



**Table 2** Program and activities of the integrated SMEP (Cont.)

<b>Week/session</b>	<b>Objectives</b>	<b>Content and Activities</b>
Week 3: Session 3 : 90 minutes : group discussion and group process (60 minutes) : personal action plans (30 minutes)	Developing and improving SM skills and intrinsic motivation	Skills training (action taking, self-tailoring, and self-reaction) using group discussion and group process to enhance self-efficacy belief. Integration of intrinsic motivation and continuing SM practice following personal action plans encouraged.
Week 4: Session 4 : 90 minutes : group discussion (60 minutes) : personal action plans (30 minutes)	Developing and improving SM skills and intrinsic motivation	Skill training (resource utilization and patient-provider relationship) using techniques such as communication and face-to-face interaction. Participants assigned to continue practicing taught SM skills and self-determination in dealing with problems as specified in their action plans.
Week 5: Session 5 : 90 minutes : relaxation techniques (30 minutes) : group discussion and group process (40 minutes) : personal action plans (20 minutes)	To provide all six SM skills (includes emotional stress, and role management; intrinsic motivation, autonomy, competence, and relatedness)	Review of SM skills Emotional management using relaxation techniques was explained through group training. Role management was trained by group discussion and group process of using four main sources of self-efficacy. Participants were assigned to continue practicing taught SM skills and self-determination in dealing with problems as specified in their action plans.
Week 6: Session 6 :90 minutes : group discussion and group process (50 minutes) : personal action plans (40 minutes)	To summarize program and follow up plan.	Repeated review of all six SM skills, program summary, and follow up plan. Enhancement of intrinsic motivation by using the main sources was repeated through group discussion and personal action plans. The researcher arranged for follow-up with participants.

**Standard care:** Standard care, according to the guidelines recommended by GINA,<sup>2</sup> was provided by a multidisciplinary team at the asthma clinic when people visited for follow up. This consisted of consultations and suggestions from the multidisciplinary team (a nurse, a pharmacist, a nutritionist, a physical therapist, and a social worker) regarding asthma control. Instruction related to inhalation techniques and health education was provided in an outpatient room by staff nurses for 30–45 minutes before patients met with the physician.

**Ethical Considerations:** The research was approved by the Research Ethics Committee of the Faculty of Nursing (No. 044/2018), Chiang Mai University, and the director of the Department of the Ministry of a tertiary care hospital located in the northeast region of Thailand, which also granted permission to conduct the research project. All eligible participants were given explanations of the study, their participation, confidentiality, and anonymity. The principal investigator (PI) received informed consent from all participants,

who were able to ask questions and refuse, or withdraw, their participation at any time without adverse effects. Signed consent forms were obtained from the participants before the initiation of the research protocols.

**Data Collection:** The study was conducted from April 2018 to September 2018 in a tertiary care hospital in Ubon Ratchathani province, northeast Thailand. Two research assistants (RAs), who were professional nurses, were trained to obtain data by administering the demographic, ACT, and QOL questionnaires before, at completion of, and 12 weeks after the end of the program. After receiving permission from the study hospitals, the PI introduced the research project. Single blinding with two groups was used to confirm that the experimental status of the participants who were unknown to the RAs. The PI provided the intervention program in every session. In the first session, the PI participants were given a booklet, "Living a Healthy Life with Asthma." No extra appointments and transportation fares were required. All outcomes were measured at baseline and at 12 weeks after completing the intervention.

**Data Analysis:** Demographic data were analyzed using descriptive statistics. The differences in the demographic data were examined by Chi-square tests or Fisher's exact tests and independent t-tests. Paired t-tests and independent t-tests were employed to investigate the differences in QOL at baseline and post-test between the experimental and control groups. Since the scores for symptom control were not normally distributed, the Mann-Whitney U test was used to test the differences between the groups.

### Results

The age range of the participants in both groups was between 19 and 59 years, with a mean of 46.86 for the experimental group and 42.80 for the control group. In both groups, there were more females than males (72.0% and 70.0%). Many demographic data were similar between participants in the experimental and control groups, except for education and living arrangements. The participants' demographic characteristics are shown in **Table 3**.

**Table 3** Demographic characteristics of patients with uncontrolled asthma between the experimental and control groups (n=100) (Cont.)

Demographic characteristics	Control (n=50)		Experiment(n=50)		Statistic test value	p-value
	n	%	n	%		
Age (Yrs)						
± SD	42.80	± 11.37	46.86	± 8.73	-1.598 <sup>a</sup>	.110
Gender					.049 <sup>b</sup>	.826
Female	35	70.00	36	72.00		
Male	15	30.00	14	28.00		
Educational level					8.509 <sup>c</sup>	.725
Elementary school	23	46.00	36	72.00		
Secondary school	27	54.00	14	28.00		
Marital status					3.027 <sup>c</sup>	.410
Married	34	68.00	41	82.00		
Single	8	16.00	4	8.00		
Widowed	5	10.00	4	8.00		
Divorced/separated	3	6.00	1	2.00		
Duration of asthma disease	8.58	±9.355	8.70	± 7.856	.069 <sup>d</sup>	.945
Years (mean ±SD)						



**Table 3** Demographic characteristics of patients with uncontrolled asthma between the experimental and control groups (n=100) (Cont.)

Demographic characteristics	Control (n=50)		Experiment(n=50)		Statistic test value	p-value
	n	%	n	%		
≤ 5	24	48.00	24	48.00	1.926 <sup>b</sup>	.382
6-10	15	30.00	10	20.00		
> 10	11	22.00	16	32.00		
Alcohol consumption history					1.056 <sup>b</sup>	.590
None	7	14.00	8	16.00		
Used to drink	21	42.00	25	50.00		
Current drink	22	44.00	17	34.00		
Numbers of ER visits (mean ±SD)	1.44±2.34		1.34±2.43		-.287 <sup>a</sup>	.774
Numbers of hospitalizations (mean ±SD)	2.06 ± 3.21		2.28±2.77		-.632 <sup>a</sup>	.528
Number of acute exacerbation (mean ±SD)	1.52 ± 3.06		1.88 ± 3.39		-1.226 <sup>a</sup>	.220
Number of incidences of work leave (mean ±SD)	1.68 ± 1.75		0.90±2.33		-4.658 <sup>a</sup>	<.001
Allergic substances *						
perfume/flower/plant	2	4.00	4	8.00		
cigarette smoke	28	56.00	30	60.00	.164 <sup>b</sup>	.685
dust	30	60.00	29	58.00	.041 <sup>b</sup>	.839
air	11	22.00	9	18.00	.280 <sup>b</sup>	.617
other	12	24.00	13	26.00	.053 <sup>b</sup>	.817

a = Mann-Whitney U; b = Chi-square test; c = Fisher's Exact test; d = t-test. \* = more than one answer

At baseline, there were no statistically significant differences between the experimental and control groups regarding their symptom control (M = 15.62 for experimental, M = 16.38 for control, p > .001) and QOL scores (M = 62.86 for experimental, M = 63.58 for control, p > .001). Twelve weeks after the completion of the program,

the mean score for symptom control of the experimental group (mean rank=74.20) was significantly higher (p < .001) than that of the control group (mean rank=26.80). The experimental group also had a higher QOL mean score (M =94.54) than the control group (M =79.12) with statistical significance (p < .001) (Tables 4 and 5).

**Table 4** Comparison of symptom control between the control and experimental groups at baseline and at 12 weeks (n = 100)

Symptom control	Control Group (n=50)		Experimental Group (n=50)		U	p-value
	Median	Inter-quate range	Median	Inter-quate range		
Baseline	16.38	2.456	15.62	2.481	1.539	0.127*
At 12 <sup>nd</sup> week	26.80	1340	74.20	3710		
U		-4.73		-22.41		
p value		<0.001		<0.001		

\* p value >0.0001

**Table 5** Comparison of QOL between the control and experimental groups at baseline and at 12 weeks (n = 100)

QOL	Control Group (n=50)		Experimental Group (n=50)		t	p-value
	Mean	(SD)	Mean	(SD)		
Baseline	63.58	14.78	62.86	8.18	0.301	0.764*
At 12 <sup>nd</sup> week	79.12	11.37	94.54	8.33	-7.735	<0.001
t	-5.823		-18.70			
p value	<0.001		<0.001			

\* p value >0.0001

## Discussion

This study examined the effects of a SMEP on symptom control and QOL among persons with uncontrolled asthma. The findings demonstrated that the SMEP had a positive effect on symptom control and QOL in people with uncontrolled asthma. In group-based sessions of the SMEP, participants in the experimental group were encouraged to share and discuss the challenges they faced related to SM, focusing on the six skills of SM, which affected three tasks. The PI acted as a facilitator and helped participants tailor the training to their specific concerns through group participation, which reduced the sense of isolation while facilitating self-efficacy and empowerment through peer learning and sharing. Daily SM personal action plans were set for each individual. Written short-term personal action plans were set each week, and long-term action plans were also developed to help participants after completing the program. Also, the participants could ask questions about their daily issues related to asthma. The SMEP involves participants taking responsibility for their health and wellbeing, as well as learning to manage any incurable long-term illnesses, and is essential to preventing further complications.

Based on the findings of this study, and many other studies, the benefits of SM for uncontrolled asthma helped participants to acquire the knowledge skills, and confidence required to modify their behaviors, manage their asthma, and improve their QOL, as well as to reduce hospitalizations.<sup>36,37</sup> It also enhanced the

ability to monitor one's condition and how it is affecting their cognitive domains and QOL; to recognize and be aware of stimulants leading to asthma exacerbation, as well as the ability to avoid those stimulants that may reduce breathing problem; and other improvements in patient's outcomes, such as reducing unscheduled visits to the physician,<sup>9</sup> and developing the skills to set and attain realistic and attainable goals.

The SMEP enhances the two domains of asthma control and future risk. Intrinsic motivation in SMEP allowed the participants to generate the drive to change the behaviors themselves. This assisted people with uncontrolled asthma to engage in SM activities to maintain appropriate and timely asthma SM behavioral initiatives. Moreover, intrinsic motivation could enable participants to play an active role in their health care, leading to improvements in their health behaviors and increase satisfaction with health care provider-participant communications. Thus, when people have a higher level of intrinsic motivation, it is reflected in their perceptions of autonomy, competence, and relatedness to carry out self-care tasks, and they are also better able to carry out SM practices.<sup>17</sup>

Another possible explanation of the augmentation in this study is that it emerged from peer support during the implementation of the interventions. It is generally believed that peer support among people who have the same chronic condition or disability enables them to share knowledge and experiences with others in a way that many healthcare workers cannot. Peer support can take many forms. In this study, group meetings

during a short break after each session, face-to-face discussions in group-based sessions, and phone call exchanges were used as methods of facilitating peer support. Peer support complemented and enhanced SM behaviors by creating the emotional, social, and practical assistance necessary for managing a condition over time and staying healthy, as well as establishing a link to clinical care with ongoing support.<sup>14,16,19</sup> The results of this study were supported by the previous studies<sup>38,39</sup> focused on using SM and SDT in people with type 2 diabetes, which found that SM behaviors program increase perceived competence and improve glycemic control.

When changing people's behaviors by developing their skills in SM using intrinsic motivation, they need assistance to generate the desire to change their behaviors, have the freedom to choose and set goals, and see the positive outcomes. This leads to role, emotional, and medical management according to an individual's desires. The new behaviors will have impact on their health, resulting in improvements in their ability to control their symptoms and live a normal life like ordinary people. Thus, asthma symptom control is proven effective in maintaining and improving functional status, and thus in this study the QOL of participants was improved.<sup>12,36,37,39,40</sup>

### **Limitations**

There are some limitations to this study. The program was only implemented at a single tertiary hospital, thus generalization of the findings is limited. Since the program was designed for groups of patients without severe complications, its application would be limited for those with severe complications.

### **Conclusions and Implications for Nursing Practice**

The results of this study indicate that the SMEP is effective in improving symptom control and QOL

among persons with uncontrolled asthma. The study needs to be replicated with different groups and possibly revised before implementation into practice and recommending it for practice or begin training nurses. This program could be applicable to persons suffering from asthma in other settings. Health care professionals who want to enhance health behaviors should consider the delivery of interactive training for asthma sufferers who come from disadvantaged groups, and enhance their skills in self-management behaviors. At the level of policy, skill training should be established for all people suffering from asthma. Thus, nurses, especially advanced practice nurses, should be trained to implement this program for similar patients. Additionally, long-term follow-up needs to be conducted to determine its effectiveness over time.

### **References**

1. Global Initiative for Asthma. A pocket guide for health professionals updated in 2019. [Internet] 2019 March 15 [cited 2019 March 15]. Available from: <http://ginasthma.org>
2. World Health Organization. Asthma. [Internet] 2019 June 12 [cited 2019 June 12]. Available from: <http://who.nhlbi.nih.gov/health-topics/asthma>
3. Boonsawat W. Asthma. [Internet] 2019 July 12 [cited 2019 July 12]. Available from: [http://eac2.easyasthma.com/site\\_data/dbregistry\\_eac/1/Asthma.pdf](http://eac2.easyasthma.com/site_data/dbregistry_eac/1/Asthma.pdf)
4. Boonsawat W. Asthma: the textbook of respiratory. Bangkok: Parbpim; 2017.
5. Sangsawang N, Sangsawang B. Depression in adults asthmatic patients: pathophysiology, impacts, related factors and nursing care. *Journal of Medicine and Health Sciences*. 2015;22(2):61-70.
6. Deci EL, Ryan RM. *Intrinsic motivation and self-determination in human behavior*. New York: Plenum; 1985.
7. Lorig KR, Holman HR. Self-management education: history, definition, outcome, and mechanisms. *The Society of Behavioral Medicine*. 2003;26(1):1-7. doi:10.1207/S15324796ABM2601\_01.
8. Adachi M, Hozawa S, Nishikawa M, Yoshida A, Jinna T, Tamura G. Asthma control and quality of life in a real-life setting: a cross-sectional study of adult asthma patients in Japan (ACQUIRE-2). *J Asthma*. 2019;56(9):1016-25. doi:10.1080/02770903.2018.1514628.

## Effectiveness of a Self-Management Enhancement Program Among Adults with Uncontrolled Asthma

9. Pinnock H, Parke HL, Panagioti M, Daines L, Pearce G, Epiphaniou E, et al. Systematic meta-review of supported self-management for asthma: a healthcare perspective. *BMC Med.* 2017;15(64):1-32. doi:10.1186/s12916-017-0823-7.
10. Griffiths C, Bremner S, Islam K, Sohanpal R, Vidal D, Dawson C, et al. Effect of an education programme for South Asians with asthma and their clinicians: a cluster randomised controlled trial (OEDIPUS). Education for South Asians with Asthma. 2016;11(12):1-16. doi:10.1371/journal.pone.0158783.
11. Liao Y, Gao G, Peng Y. The effect of goal setting in asthma self-management education: a systematic review. *Int J Nurs Sci.* 2019;6:334-342. doi:10.1016/j.ijnss.2019.04.003.
12. Aaron SD, Boulet LP, Reddel HK, Gershon AS. Underdiagnosis and overdiagnosis of asthma. *Am J Respir Crit Care Med.* 2018;198(8):1012-1020. doi:10.1164/rccm.201804-0682CI.
13. Martin MA, Catrambone CD, Kee RA, Evans AT, Sharp LK, Lyttle C, et al. Improving asthma self-efficacy: developing and testing a pilot community-based asthma intervention for African American adults. *J Allergy Clin Immunol.* 2009;123(1):1-17. doi:10.1016/j.jaci.2008.10.057.
14. Namrata H, Xinyue F, Weifen L, Soong YK. Evaluation of a chronic disease self-management program in Singapore. *J Chronic Dis.* 2016;1(1):1-4.
15. Smith L, Bosnic-Anticevich SZ, Mitchell B, Saini, Krass I, Armour C. Treating asthma with a self-management model of illness behaviors in an Australian community pharmacy setting. *Soc Sci Med.* 2007;64(7):1501-11. doi:10.1016/j.socscimed.2006.11.006.
16. Speck AL, Hess M, Baptist AP. An electronic asthma self-management intervention for you young African American adults. *J Allergy Clin Immunol Pract.* 2015;4:89-95. doi:10.1016/j.jaip.2015.08.007.
17. Londono AMM, Schulz PJ. Influences of health literacy, judgment skills, and empowerment on asthma self-management practices. *Patient Educ Couns.* 2015;98:908-17. doi:10.1016/j.pec.2015.03.003.
18. Seifert CM, Chapman LS, Hart JK, Perez P. Enhancing intrinsic motivation in health promotion and wellness. *Am J Health Promot.* 2012;26(3):1-12. doi:10.4278/ajhp.26.3.tahp. doi:10.4278/ajhp.26.3.tahp.
19. Polgar-Bailey P. Asthma. In: Buttaro TM, Trybulski J, Polgar-Bailey P, Sandberg-Cook, editors. Primary care [internet]. 5th ed. Elsevier, Inc; 2020 [cited 2020 Oct 18]. Available from: <http://clinical key for nursing.com>
20. National Heart Lung and Blood Institute (NHLBI). Expert Panel Report 3: guidelines for the diagnosis and management of asthma 2007. [cited 2020 June 1]. Available from <https://nhlbi.nih.gov/health-topics/all-publications-and-resources/expert-panel-report-3-epr-3-guideline/full-report>
21. Jimenez-Ruiz CA, Andreas S, Lewis KE, Tonnesen P, Schayck CP, Hajek P, et al. Statement on smoking cessation in COPD and other pulmonary diseases and in smokers with comorbidities who find it difficult to quit. *Eur Respir J.* 2015;46:61-79. doi 10.1183/09031936.00092614.
22. Johnson PH, Chambers P, Dexheimer JW. Asthma-related emergency department use: current perspectives. *Open Access Emerg Med.* 2016;13(8):47-55. doi:10.2147/OAEM.S69973.
23. Juniper EF. Asthma quality of life questionnaires (AQLQ, AQLQ(S), miniAQLQ and acute AQLQ). 2016. [cited 2018 June 15]. Available from: <http://qoltech.co.uk>
24. Ferrans CE Powers MJ. Psychometric assessment of the quality-of-life index. *Res Nurs Health.* 1992;15:29-38. doi:10.1002/nur.4770150106.
25. Lorig K. Self-management of chronic illness: a model for the future. *Generations XVII.* 1993;3:11-4.
26. Kanfer FH. Implications of a self-regulation model of therapy for treatment of addictive behaviors. In: Miller WR., Heather N. editors. Treating addictive behaviors. Springer; 1986. pp. 29-47.
27. Hankhuan S, Wannapornsiri C Vichitkaew N. The effects of self-efficacy program for health care behavior on asthma control. *Nurs Health Sci.* 2010;4(2):72-81.
28. Ruengkajorn O, Kittiwatanapaisan W. The effectiveness of self-management program on self-management behavior and asthma controlled level in asthma patient at Ranode Hospital, Songkhla Province. *Journal of Nursing Science & Health.* 2011;34(3):11-21.
29. Wongwai C, Khampulikit S, Poachanukoon O. The effects of a self-management program on asthma control scores and lung function of asthmatic patients. *Thai Journal of Tuberculosis Chest Diseases and Critical Care.* 2012;33(3):89-99.
30. Pimkhot N, Suebsoh W, & Teewunda D. Effect of perceived self-efficacy and social support on behavior modification of asthma patients. *PHJBUU.* 2013;8(2):81-91.

31. Sirithongsuk A, Theeranut A, Boonsawat W. Effects of a self-efficacy promotion program on self-efficacy and preventing behavioral of acute exacerbations in asthmatic patients. *Journal of Nursing Science & Health*. 2016; 39(1):61–69.
32. Suwannachart W, Uakit N. The effect of perceived self-efficacy promoting program on self-management behavior in asthma adult patients. *KJN*. 2016;23(1):60–72.
33. Nathan RA, Sorkness CA, Kosinski M, Schatz M, Li T, Marcus P, et al. Development of the asthma control test: a survey for assessing asthma control. *J Allergy Clin Immunol*. 2004;113(1):59–65. doi: 10.1016/j.jaci.2003.09.008.
34. Vongsa et al. Asthma Control Test (ACT). In: Thai Asthma Council guidelines for the diagnosis and treatment of asthma in Thailand V5 for adult and children 2012. Bangkok: Union Ultra Violet; 2012. pp.61–2.
35. Juniper EF, Wisniewski ME, Cox FM, Emmett AH, Nielsen KE, O’Byrne PM. Relationship between quality of life and clinical status in asthma: a factor analysis. *Eur Respir J*. 2004;23(2):287–91. doi:10.1183/09031936.04.00064204.
36. Leurmarkkul W. Health-related quality of life questionnaire development. *Thai J Pharm Sci*. 2000;24(2):71–5.
37. Hodkinson A, Bower P, Grigoroglou C, Zghebi SS, Pinnock H, Kontopantelis E, et al. Self-management interventions to reduce healthcare use and improve quality of life among patients with asthma: systematic review and network meta-analysis. *BMJ*. 2020;370:1–12. doi:10.1136/bmi.m2521.
38. Williams GC, McGregor HA, Zeldman A, Freedman ZR, Deci EL. Testing a self-determination theory process model for promoting glycemic control through diabetes self-management. *Health Psychol*. 2004;23(1):58–66. doi: 10.1037/0278-6133.23.1.58.
39. Kosse RC, Koster ES, Kaptein AA, Vries TW, Bouvy ML. Asthma control and quality of life in adolescents: the role of illness perceptions, medication beliefs, and adherence. *J Asthma*. 2020;57(10):1145–54. doi:10.1080/02770903.2019.1635153.
40. Khusial RJ, Honkoop PJ, Usmani O, Soares M, Simpson A, Biddiscombe M, et al. Effectiveness of myAirCoach: a mHealth self-management system in asthma. *J Allergy Clin Immunol Pract*. 2020;8(8):1972–9. doi: 10.1016/j.jaip.2020.02.018.

## ผลของโปรแกรมการส่งเสริมการจัดการตนเองต่อการควบคุมอาการและคุณภาพชีวิตของผู้เป็นโรคหืดที่ควบคุมไม่ได้: การทดลองแบบสุ่มและมีกลุ่มควบคุม

พรทิพย์ แก้วสิงห์ ดาราวรรณ ต๊ะปิ่นตา\* จินดารัตน์ ชัยอาจ ชมพูนุท ศรีรัตน์

**บทคัดย่อ:** ผู้ป่วยโรคหืดที่ควบคุมไม่ได้ต้องเผชิญกับความยากลำบากในระหว่างการทำตามแผนการดูแลสุขภาพของตนเองเป็นแนวทางหนึ่งในการทำให้ผลลัพธ์ด้านสุขภาพของผู้ที่เป็นโรคหืดดีขึ้น การศึกษาครั้งนี้มีวัตถุประสงค์เพื่อทดสอบผลของโปรแกรมการส่งเสริมการจัดการตนเองต่อการควบคุมอาการและคุณภาพชีวิตในผู้ป่วยโรคหืดที่ควบคุมไม่ได้ การศึกษานี้อยู่ในช่วงเดือนเมษายนถึงกันยายน 2561 ศึกษาในโรงพยาบาลตติยภูมิของจังหวัดหนึ่งในภาคตะวันออกเฉียงเหนือของประเทศไทย ดำเนินการทดลองแบบสุ่มและมีกลุ่มควบคุมกับผู้เข้าร่วมวิจัยจำนวน 50 คนที่ได้รับการสุ่มเป็นกลุ่มทดลองและผู้เข้าร่วมวิจัยจำนวน 50 คนที่ได้รับการสุ่มเป็นกลุ่มควบคุม กลุ่มควบคุมได้รับการดูแลตามมาตรฐาน ในขณะที่กลุ่มทดลองได้รับโปรแกรมการส่งเสริมการจัดการตนเองเป็นระยะเวลา 6 สัปดาห์ ประเมินผลหลังสิ้นสุดโปรแกรม 12 สัปดาห์ แบบสอบถามที่ใช้ประกอบด้วย แบบประเมินผลการควบคุมโรคหืดและแบบวัดคุณภาพชีวิตสำหรับผู้ป่วยโรคหืดฉบับย่อ วิเคราะห์ข้อมูลโดยใช้สถิติเชิงพรรณนา paired t-test independent t-test และ Mann-Whitney U test

ผลการวิจัยพบว่ากลุ่มทดลองมีการควบคุมอาการและคุณภาพชีวิตดีขึ้นกว่าก่อนเข้าร่วมโปรแกรม และกลุ่มทดลองมีการควบคุมอาการและคุณภาพชีวิตดีขึ้นอย่างมีนัยสำคัญทางสถิติเมื่อเปรียบเทียบกับกลุ่มควบคุม 12 สัปดาห์ หลังสิ้นสุดโปรแกรม 6 สัปดาห์ ข้อค้นพบนี้ชี้ให้เห็นว่าโปรแกรมการส่งเสริมการจัดการตนเองอาจเป็นวิธีที่มีประสิทธิภาพในการส่งเสริมการควบคุมอาการและคุณภาพชีวิต พยาบาลหรือบุคลากรด้านสุขภาพสามารถประยุกต์ใช้โปรแกรมนี้ในการปรับเปลี่ยนพฤติกรรมสุขภาพของผู้ป่วยโรคหืด พยาบาลควรได้รับการฝึกให้มีความสามารถให้ข้อมูลและสร้างแรงจูงใจให้ผู้ที่เป็นโรคหืดที่ควบคุมไม่ได้สามารถจัดการตนเองได้อย่างต่อเนื่อง

*Pacific Rim Int J Nurs Res 2021; 25(3) 375-388*

**คำสำคัญ:** คุณภาพชีวิต โปรแกรมการจัดการตนเอง โรคหืดที่ควบคุมไม่ได้ การควบคุมอาการ

พรทิพย์ แก้วสิงห์ นักศึกษาหลักสูตรปริญญาเอก คณะพยาบาลศาสตร์ มหาวิทยาลัย  
เชียงใหม่ E-mail: taro.12345@hotmail.com; Pornthip.kae@bcnsp.ac.th  
ติดต่อที่: ดาราวรรณ ต๊ะปิ่นตา\* ศาสตราจารย์ คณะพยาบาลศาสตร์ มหาวิทยาลัย  
เชียงใหม่ E-mail: darawan1995@gmail.com  
จินดารัตน์ ชัยอาจ ผู้ช่วยศาสตราจารย์ คณะพยาบาลศาสตร์ มหาวิทยาลัย  
เชียงใหม่ E-mail: darachai@yahoo.com  
ชมพูนุท ศรีรัตน์ ผู้ช่วยศาสตราจารย์ คณะพยาบาลศาสตร์ มหาวิทยาลัย  
เชียงใหม่ E-mail: chomphoonut.s@cmu.ac.th