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# ASTHMA INTERVENTIONS AIMED AT OLDER ADULTS

## A Literature Review

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Abstract
As the prevalence of asthma in the older adults is increasing, health care professionals, such as nurses will be facing older asthmatics more frequently among the health services. Thus, the aim was to discover asthma interventions planned for older adults, and to reveal what kind of positive effects these interventions have on the subjects. The purpose of this research was to present health care professionals with good practices for the care and management of older asthmatics.

Literature review was used as a research method in this research. This paper uncovered a total of eight interventions for older asthmatics. Even though they had very different approaches, similarities among many of the studies were also discovered. The focus on self-management of asthma and individualized care was emphasised in several interventions. Positive effects, such as better self-management, improved asthma control and quality of life were reported as a result of the interventions.

Some of the interventions presented in this literature review could be introduced to practice as a basis for asthma management in the older adults. However, it would be necessary to conduct further research about asthma in older adults, because it has been studied quite little earlier. In addition, the common obstacles in the management of asthma in older people should be addressed better in the planning and implementing of new asthma interventions.

Keywords
Asthma, elderly, intervention, nursing, self-management, literature review

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Tiivistelmä

Astman yleistyminen vanhuspotilailla tarkoittaa, että terveydenhuollon työntekijät, kuten sairaanhoitajat tulevat kohtaamaan ikääntyviä astmapotilaita työssään entistä useammin. Tämän tutkimuksen tavoitteena oli kartoittaa ikääntyville suunnattuja astmainterventioita ja niiden positiivisia vaikutuksia osallistujiin. Tarkoituksena oli esittää terveydenhuollon työntekijöille hyviä toimintatapoja ikääntyvien astmaatikoiden hoitoon.

Tämä opinnäytetyö toteutettiin kirjallisuuskatsauksena, johon valikoitui kahdeksan ikääntyville suunnattua astmainterventiota. Vaikka lähestymistavat interventioissa olivat hyvin erilaisia, samankaltaisuuksiakin niistä löytyi. Monet interventioista painottivat itsehoitoa ja yksilöllistä lähestymistapaa työskenneltäessä ikääntyvien astmapotilaiden kanssa. Astmainterventioilla oli osallistujiin positiivisia vaikutuksia, kuten astman itsehoidon kehittyminen, sekä astman hoitotasapainon ja elämänlaadun paraneminen.

Osa kirjallisuuskatsaukseen valikoituneista interventioista voitaisiin ottaa käyttöön sellaisenaan ikääntyvien astmapotilaiden hoidossa. Jatkotutkimusten toteuttaminen aiheesta olisi kuitenkin tärkeää, koska aihetta on tutkittu vielä varsin vähän. Lisäksi tulevaisuudessa tulisi kartoittaa tarkemmin ikääntyvien astman hoitoon liittyviä erityiskysymyksiä astmainterventioiden suunnittelussa ja toteuttamisessa.



Avainsanat (asiasanat)

Astma, vanhus, interventio, hoitotyö, itsehoito, kirjallisuuskatsaus, asthma, elderly, intervention, nursing, self-management, literature review

# Content

# 1 Introduction

The amount of aging population is increasing, and by the year 2050 it has tripled, being about 1.5 billion. In developed countries the increase in the amount of people over 65 years old is even greater. (Global Health and Aging 2011, 2.) Thus, the aged individuals will form a remarkable patient group among the health services and the health care professionals need to be prepared for that. Furthermore, common chronic diseases, such as asthma will be faced by health care professionals regularly. Better understanding of the obstacles that might interfere with the proper management of asthma in older people, and means to promote the self-care and good asthma management will thus be valuable.

This paper focuses on the asthma care of older adults and elderly people. The writer formed an interest in the topic after realising that the causes and overall treatment of asthma can be different with the adults and elderly compared to younger asthmatics. Furthermore, diagnosing asthma in older adults can be difficult, and other concurrent illnesses and age-related changes in physical and cognitive functions present problems in the management of asthma in aged individuals. (Chotirmall, Watts, Branagan, Donegan, Moore & McElvaney 2009, 901; Cousens, Goeman, Douglass & Jenkins 2007, 729.)

Generally, nursing students receive some basic information about asthma, and thus, have some knowledge of it, but there are some special considerations in the management of asthma in the older adults. Asthma in the older age groups is often underdiagnosed and undertreated, and thus it is essential to be better informed of the effective care of older asthmatics. (Chotirmall et al. 2009, 901; Cousens et al. 2007, 729.)

The aim of this literature review is to focus on the care of older adult and elderly asthmatics, and thus also learn more about promoting the self-care of them. More precisely, the aim is to summarize and analyse current research concerning asthma interventions aimed at older adult and elderly asthmatics, and to reveal what kind of outcomes these interventions have on the subjects. To be clearer, the writer will use the term older adults in this bachelor's thesis to cover all individuals in the focus group of this research. This means older adults that are over 50 years old.

# 2 Aging

Increasing age causes changes in the physical, cognitive and psychosocial functioning of an individual. However, these changes are individual and vary among people. In addition, sometimes it might be difficult to determine whether changes occur due to an illness or by the aging itself. (Smeltzer, Bare, Hinkle & Cheever 2010, 202-203.)

The physical changes related to aging may include e.g. decrease in the cardiac and respiratory functions, such as decreased cardiac output and respiratory muscle strength, as well as, gas exchange. Furthermore, physical changes occur in reproductive, integumentary, nervous, musculoskeletal, and gastrointestinal systems. In addition the sensory system is also affected as a result of aging. As a result of these physical changes in older adults, the pharmacological treatment needs careful consideration. The effect of medications can be altered due to differences in absorption, distribution, metabolism and excretion of the substance. In addition, it is not uncommon

for older adults to have several medications, and thus the possibility of interactions need to be considered. (Smeltzer et al. 2010, 203-209 & 212-213.)

Psychosocial coping of an aging individual depends on the ability to readjust oneself to the changing situation, because aging causes also some physical, social and emotional losses. Aging individuals need to be able to experience contentment in the everyday life. The cognitive aspects related to aging are often affected by other changes in an individual's life. Cognitive functions that might be affected include intelligence, learning and memory. (Smeltzer et al. 2010, 209-212.)

# 3 Asthma as a disease

Asthma is a chronic inflammatory disease of the airways that causes narrowing of the airways, increased airway responsiveness to stimuli and hyper-secretion of mucus. The increased responsiveness of the airway leads to bronchoconstriction and the excess mucus production further blocks the airflow. Asthma is usually reversible, either spontaneously or with treatment. Nevertheless, it has significant effects on the asthmatic's life. It may interfere with the everyday life and limit one's life-style choices. (Robinson & Scullion 2008, 147-148; Smeltzer et al. 2010, 620-621; Ward, Ward, Leach & Wiener 2011, 57.)

Asthma is often divided into two subtypes: allergy-induced and exercise-induced asthma. In allergy-induced asthma, the patient often has allergy alongside with the asthma, and the worsening of asthma may be induced by

some allergens. These might be e.g. dust, mould, animal dander, trees, grass, air pollutions, smoke, strong odours or medications. With exercise-induced asthma, the asthma is worsened by physical effort, and the inflammation of the airways causes bronchoconstriction. (Smeltzer et al. 2010, 621; Ward et al. 2011, 57.)

Asthma is a respiratory disease that according to the World Health Organization affects about 235 million people in the world at the moment (Asthma, Fact sheet N°307, 2011). It is more common in the Western countries, and the prevalence is further increasing. Ward et al. (2010, 57) suggest that about 5 % of people in the western world suffer from asthma symptoms. Although the treatment of asthma has improved, the death rate is similarly increasing. The mortality is especially high in older asthmatics (Cousens et al. 2007, 730). Asthma also causes a significant amount of hospitalizations every year. (Smeltzer et al. 2010, 620-621; Ward et al. 2010, 57.)

## 3.1 Symptoms and diagnosis of asthma

Asthma symptoms vary in the severity among asthmatics, and for most asthmatics, there are symptomless periods as well. However, it is notable that older patients might consider their symptoms less severe, than they actually are (Cousens et al. 2007, 730). Generally, the symptoms of asthma include dyspnoea, wheezing, cough and chest tightness. Often they are more common during the night or in the early morning. Exercise and cold weather may also induce asthma attacks. Similarly, different allergens and respiratory tract infections usually exacerbate asthma. (Smeltzer et. al 2010, 621.)

Asthma is usually diagnosed by familiarizing to the patient's medical history, auscultating the lungs and conducting peak expiratory flow (PEF) measurement, which may also be done home. Sometimes the doctor may examine the pulmonary function by making a spirometer test. However, this might be difficult to execute with the older adults, because of changes in the lung function due to their age (Chotirmall et al. 2009, 901). Exercise test, radiological tests and trial run of medication therapy are also among the possible investigations. (Kauppi 2011a.)

The diagnosis of asthma in older adults is often difficult, because the symptoms may remind some other conditions also, most commonly e.g. chronic obstructive pulmonary disease (COPD) or heart diseases. In addition, the symptoms are often regarded as something that is normal for aging individuals. When asthma symptoms are developed in an older age, asthma might even stay undiagnosed. (Chotirmall et al. 2009, 901.)

## 3.2 Treatment of asthma

Asthma is usually managed with inhaled corticosteroids that prevent the inflammation of the airways. In addition, bronchodilators such as inhaled beta-agonists may be used. If the symptoms of asthma are very mild, inhaled beta-agonist might be the only treatment for asthma. However, the treatment combinations vary between patients, and depend on the severity of the symptoms. As patients may have symptomless periods as well, the medication treatment is planned according to each condition. Sometimes it might be necessary to include an oral corticosteroid therapy in special cases such as during viral infections. It is advisable to quit smoking, and also to use other medications cautiously. In allergy-induced asthma the causes behind the

exacerbation of asthma symptoms are usually also addressed. The allergens that worsen each asthmatic's symptoms are minimized or completely avoided. (Kauppi 2011b.)

There are some special considerations usually made in the pharmacological treatment of older asthmatics. Firstly, older people often have many other recurrent illnesses and medications that need to be considered in the overall management of asthma. Due to the age-related changes in physical and cognitive abilities, older adults might also have problems in taking their medication, and thus they can require assistance in the administration of medication. Especially the use of inhaled medication can be very difficult for older people, and thus choosing e.g. extension devices for pressurized metered dose inhalers will promote better pharmacological care. (Chotirmall et al. 2009, 904-905.)

## 3.3 Exacerbation of asthma

Worsening periods of asthma usually require some titration of medication treatment temporarily. Asthmatics themselves are often the best to evaluate the sufficiency of their medication. However, with the older adults it is common to underestimate the severity of the symptoms (Cousens et al. 2007, 730). The most common reason behind exacerbation of asthma is a respiratory tract infection. It causes worsening of symptoms during the night, and asthmatics may experience that their capacity to tolerate effort is remarkably diminished. This is associated with increased dyspnoea and cough. In addition, the peak expiratory flow (PEF) value is worsening. In these situations, asthmatics require more medication than normally. If the exacerbation of asthma is very serious, it might also require hospital

treatment. Thus, the goal of good asthma care is also to prevent hospitalizations. (Haahtela 2010; Kauppi 2011c.)

### 3.4 Self-care and management of asthma

As with many other chronic diseases, patient compliance to the self-care is in a key role in the management of asthma. Patients themselves make their own life-style choices concerning e.g. smoking, nutrition and exercise. Naturally, medication treatment and its titration is one way to manage asthma, and thus, being able to assess one's own condition is vital. However, there are other means to affect one's coping with asthma. These include the utilization of air humidifiers, protecting oneself properly in cold air, and the avoidance of exacerbating factors of asthma. (Haahtela 2010.) However, with older asthmatics the self-management may be interfered with the age-related changes to the physical and cognitive functions, and thus there is a need for more individualized asthma care delivery in these age groups (Chotirmall et al. 2009, 901).

## 4 Purpose, aim and research questions

The aim of this study is to uncover what kind of asthma interventions there are for the management of older asthmatics. In addition, the writer wants to reveal what positive effects these interventions have on the subjects. Thus, the plan is to unearth the best practices for the care of older asthmatics.

Asthma is a chronic disease that is increasing in the prevalence and morbidity among older adults, and it is essential for health care professionals such as nurses to know more about the care of these patients. Thus, the purpose of this study is to present valuable, evidence-based information for health care professionals and nursing students about the care of older asthmatics.

The main research questions are the following:

1. What interventions there are for the management of asthma in older patients?

2. What kind of positive effects and outcomes do these interventions have on older asthmatics?

# 5 Conducting the literature review

Literature review is an objective summary of the current researches about a chosen topic that explores the topic in depth. It aims to provide thoroughly analysed conclusions of the relevant scientific literature. Systematic approach in the literature search is advisable. In addition, it is important to focus on searching material from several sources, and to define the search well before conducting it. By doing this, the literature review will be more reliable. (Cronin, Ryan & Coughlan 2008, 38; Ross 2012, 28-31.)

The plan was to use a narrative literature research as a research method, but to increase the reliability of this study, the reviewer presents the exact inclusion and exclusion criteria for the literature selection, and thus, the approach reminds the methods of a systematic literature review. In addition,

the aim in this review was to answer the beforehand set research questions. A systematic literature review is a more defined method of literature reviews that aims to answer specific research question. However, in this review, by using a traditional narrative literature research, the plan was to form an analysis of the current significant literature related to the research questions. Thus, the goal was to discover themes and concepts among the searched literature, and draw conclusions about similar topics. (Cronin et al. 2008, 38-41; Ross 2012 30-31.)

## 5.1 The literature selection

Firstly, the purpose in the literature selection was to use electronic databases in searching the suitable literature, and search the materials by using keyword searches. The chosen databases are PubMed, Cinahl (EBSCO), Academic Search Elite (EBSCO) and Ovid. Secondly, after testing different keywords in different databases, the final keywords for the literature search were formed. The literature search was done by using keyword searches, and it was conducted on 20th and 21th of October 2013, and the keywords that were formulated were partly cut to allow better results. Finally, the following keywords were chosen: asthma*, elderly, older, manag*, promot* and nursing. The reviewer chose these keywords, because it was presumable that more simple and wide keywords would generate better results in the literature search as asthma interventions in older patients have been studied quite little earlier (Baptist, Talreja & Clark 2011, 133). By choosing to cut the words asthma*, manag* and promot*, the aim was to widen the search e.g. by accepting both asthma and asthmatic(s) as keywords, and similarly the cut words manag* and promot* allowed different forms of the words. These keywords were combined in the following way: asthma* AND elderly or older or manag* or promot* or nursing.

At this point the reviewer decided to concentrate on literature that was written between the years 2003 and 2013 to receive the most current researches. Furthermore, the search was limited to free full text articles only. In addition, the age group of the researched people was limited, where it was possible, because the purpose was to study older asthmatics. Originally, the age limit was set to be people over 65 years old, but in the end, the reviewer accepted also articles that concentrated on interventions planned for older adults, and in the final review the age limit was set to be older asthmatics that are over 50 years old. This caused the writer to conduct the literature search twice and also to refine the inclusion and exclusion criteria after the first literature search. In the end, all of the chosen articles focused on older adults, and thus, were relevant for this review. This literature review process described here follows the conduction of the second literature search.

In the first phase of the literature search the reviewer obtained 65 titles from Ovid, 477 titles from PubMed, 329 titles from Academic Search Elite (EBSCO) and 85 from Cinahl (EBSCO), thus, resulting in a total of 956 articles. After browsing through these articles, most of them were excluded based on their title, and after this there were 162 articles left. The excluded articles contained titles that referred to e.g. specific generic asthma medication, alternative medication treatment, biochemistry or asthma in children or adolescents. At this point, it was accepted that some articles might be found from several of the databases that were used.

The next phase was to read through the abstracts of the rest of the articles, and based on those, choose the suitable articles for the literature review. Most important in this phase was to choose primary research articles that would address the beforehand set research questions. Due to the reviewer's

understanding of different languages, studies that were published either in English or Finnish were chosen. Most importantly, the reviewer wanted to find studies that could be relevant for the nursing care of older asthmatics. The exact inclusion and exclusion criteria are presented in Table 1. Inclusion and exclusion criteria.

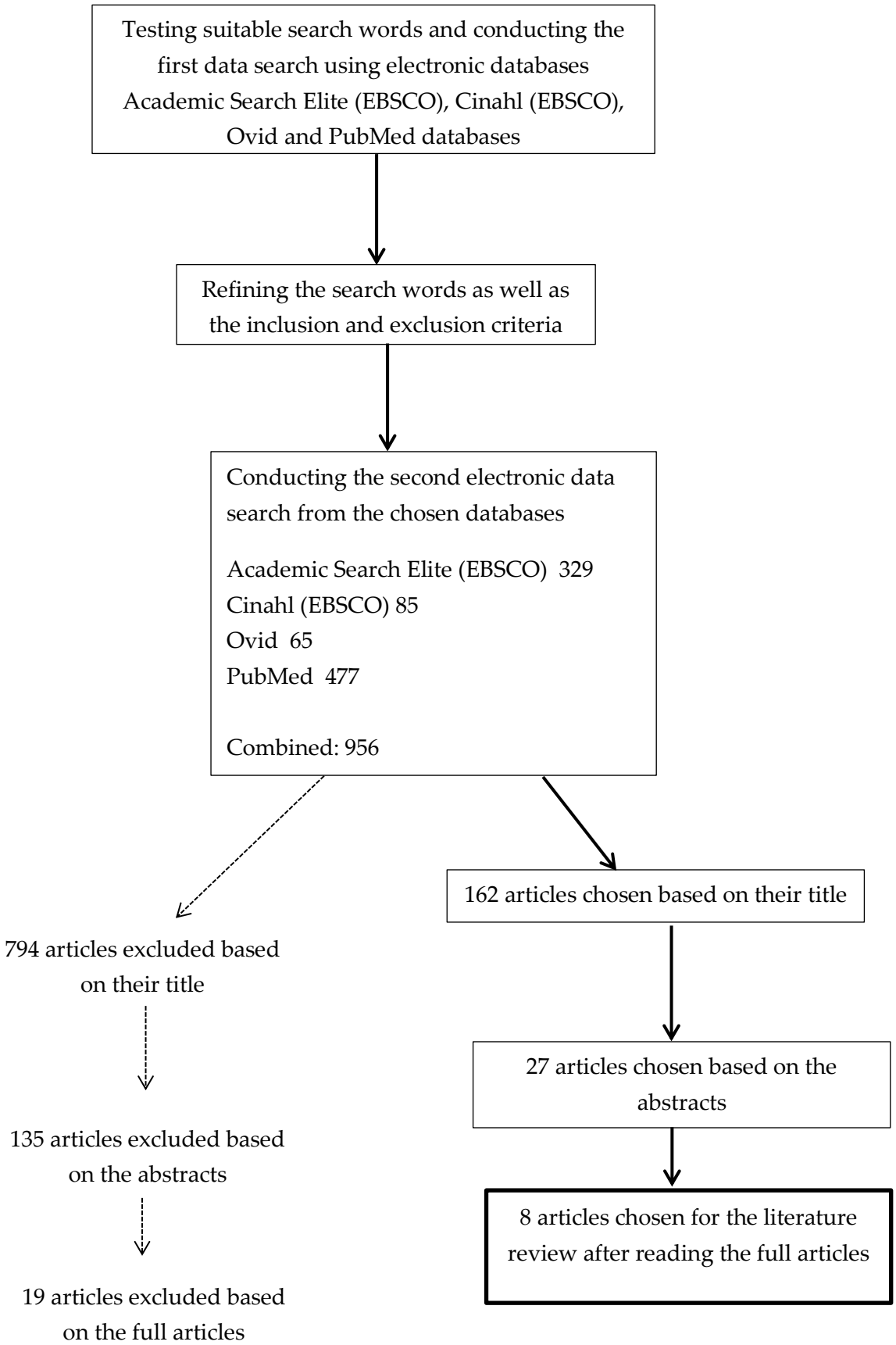
**Table 1. Inclusion and exclusion criteria**

| |
|---|
| **INCLUDED**<br>• Older asthmatics (over 50 years old)<br>• Articles published between the years 2003-2013<br>• Articles published in English or Finnish<br>• Articles available as free full text articles<br>• Interventions aimed at older asthmatics<br>• Original studies |
| **EXCLUDED**<br>• Literature reviews were excluded<br>• Articles concerning children, adolescents and younger adults excluded<br>• Articles that dealt with the care of elderly asthmatics in acute hospital settings<br>• Studies that addressed specific generic medication therapy were excluded |

After reading the abstracts of the remaining articles, the amount of titles was limited to 27. A more precise examination of the articles was necessary, and the reviewer only chose articles that dealt with asthma interventions, and could be useful for health care professionals, such as nurses. The articles that

were excluded at this point focused mainly on asthma care of younger adults or on the management of chronic illnesses generally. In addition, articles were excluded because they presented poorly the part of the older subjects, had very small sample size or were not interventions. Furthermore, some articles were excluded because they focused on the care of older asthmatics in very specific situations, such as during immunotherapy or in acute care settings. Finally, the reviewer wanted all of the studies to answer the research questions. Thus, after reading all of the remaining articles, there were 8 articles left for the review. In the next page, the process of the literature search is presented in Figure 1.

Figure 1. The process of the literature search and study selection



### 5.2 Analysing the research literature

After selecting the 8 articles for the review, the reviewer read them through carefully to gain better understanding of the approaches used in them, and to get an overall picture of the studies. The reviewer has used a narrative literature research method in analysing the selected articles for this review. Thus, purpose is to present general information regarding the chosen literature. In addition, the review attempts to synthesize the literature and discuss the findings objectively. (Cronin et al. 2008, 38-41.)

The findings from the extracted researches were organised in themes, and the results presented in a narrative form. The reviewer's aim was to reveal similarities and differences among the literature, and then make objective conclusions about the studies. Mainly the themes were formed based on the similarities in the approaches used in the interventions or the focus of the studies. In addition, the positive outcomes were based on the reported outcomes of the interventions that arose as significant. Because the studies reported the results in different ways, the reviewer attempted to unfold the contents of some outcomes more precisely.

## 6 Results

The chosen 8 studies were all different types of interventions planned for older asthmatics. They were published between the years 2004 and 2013. These studies were all published in English, and three of them were North-American, two Australian, one Polish, one Brazilian and one Taiwanese. The studies were published in different nursing journals, medical journals and

journals of the specific field. Authors of the chosen studies were mainly on the field of internal medicine or nursing sciences.

## 6.1 Characteristics of the studies

The chosen studies were suitable for this review because they answered the beforehand set research questions, and could be beneficial for health care professionals such as nurses. However, the authors of the studies defined the ages of older adults and elderly in different ways, so the age groups in these studies differ, being older adults over 50 years old. In addition, one of the included studies had a very wide range of different aged people, but the mean age in that study was 60 years, and thus, it applied this review. Furthermore, the aims and approaches in these studies differed very much, and thus, comparing the studies was quite challenging. In the Appendix 1 there is a general description of each of the studies.

## 6.2 Asthma interventions

Two of the studies were not asthma programs for older adults, but rather interventions to evaluate the effectiveness of certain factors related to asthma care. Another one of the two studies aimed at estimating the adherence of older asthmatics to medication treatment after monitored therapy (Bozek & Jarzab 2010, 162), and the other one assessed the value of peak flow monitoring and symptom monitoring as part of asthma care (Buist, Vollmer, Wilson, Frazier & Hayward 2006, 1077). The reviewer chose to include the studies in this review, because they were interventions planned for older asthmatics, and provided valuable information about the management of asthma in the older age groups.

Three of the studies aimed at evaluating the self-management of asthma in the older adults (Huang, Li & Wang 2008, 348-358; Koch, Jenkin & Kralik 2004, 484-492; Tousman, Zeitz & Taylor 2010, 71-88). In addition, one of these three studies also focused on assessing the psychological outcomes of the intervention on the self-efficacy, and improvements on knowledge, behaviour and quality of life (Tousman et al. 2010). All of these three studies had different approaches in the implementation of the studies, but similar to all programs was the emphasis on individuality in the study methods. In addition, the studies worked in collaboration with the older asthmatics in all of the three studies. In these self-management studies, the monitoring of one's symptoms was an essential part of the implementation of the studies. Two of them included discussion about self-management of asthma with the participants in the actual implementation of the intervention (Koch et al. 2004, 486-488; Tousman et al. 2010, 74-78). However, the study conducted by Koch et al. (2004, 484-492) attempted to discover different self-management models, and thus, had a unique approach. As a result of this approach, it is impossible to report any positive effects on the older participants, but rather assess the possible benefits the study might have for future nursing care of older asthmatics.

In the study conducted by Huang et al. (2008, 350-352) older adult asthmatics were divided into three groups. One of the groups received usual care, another individualized education and the third one individualized education with peak flow monitoring. A nurse designed an individualized education program for the patients in collaboration with the patients, their family members and the health care team. The third group received the same individualized education program as the second group, but they were also

given guidance in the use of peak flow meter. It was clear that the programs allowed discussion between the participants and the nurse, and it was also possible for the subjects to modify their treatment in collaboration with their physician. Thus, the individual role of each participant was well acknowledged.

Tousman et al. (2010, 74-78) conducted a learner-centred self-management program, which utilized different techniques in the intervention. They organized 2-hour long meetings weekly for seven weeks in which the group dealt with individual status reports, discussed as a group of a new topic and homework. The concept of a learner-centred self-management in their study was based on the idea that learners themselves take responsibility, and commit to behavioural change through encouragement.

One of the studies was conducted as a telephone intervention, and it examined whether the intervention improved the asthma care of the older adults. The study aimed at evaluating the effectiveness of asthma education on the older age groups. In this study the concept was different from the other studies, because it based the intervention on the questionnaire, but did not perform any other program for the older asthmatics. In addition, this study was executed separately for all individuals. (Patel, Saltoun & Grammer 2009, 30-31.)

Evers, Jones, Iverson and Caputi (2013) produced a marketing campaign targeted to older adults that aimed at increasing asthma awareness. This was a unique intervention among the eight studies chosen for this review, as it focused on both asthmatics, as well as healthy individuals. The researchers in

this study also attempted to encourage older adults with respiratory symptoms to find more information about asthma or discuss these symptoms with their doctor.

The last one of the studies included in this review focused on assessing the effects of a respiratory exercise program for older asthmatics. This study had a very practical approach. In the respiratory exercise program, the researchers evaluated the effects of a 16-week program to the lung function, respiratory muscle strength and aerobic capacity. In addition, other evaluated factors were the quality of life and clinical presentation after the program. It could be stated that this intervention could probably not be implemented by nurses, but it provided results that are relevant for all health care professionals participating in the care of older asthmatics. (Gomieiro, Nascimento, Tanno, Agondi, Kalil & Giavina-Bianchi 2011, 1165-1167.)

It is notable that in half of the studies group activities were utilized in performing the interventions (Buist et al. 2006, 1077; Gomieiro et al. 2011, 1166; Koch et al. 2004, 484; Tousman et al. 2010, 71). The rest of the studies were mainly aimed at separate participants individually (Bozek et al. 2010,162; Evers et al. 2013; Huang et al. 2008, 348; Patel et al. 2009, 30). However, the study by Huang et al. (2008, 350-351) utilized collaboration with the family members of the asthmatics, and Evers et al. (2013) conducted an intervention that could reach several participants at once.

## 6.3 The positive outcomes of the interventions on the older asthmatics

In the studies, several methods were used to evaluate the effectiveness of the interventions. Most of the studies found positive outcomes on the older asthmatics through their interventions.

### 6.3.1 Asthma control

Better asthma control, such as fewer asthma and respiratory symptoms were positive outcomes discovered in most of the studies (Bozek et al. 2010, 163; Gomieiro et al. 2011, 1167; Huang et al. 2008, 353; Tousman et al. 2010, 80). In addition, Buist et al. (2006, 1082) used Asthma Quality-of-Life Questionnaire to assess the quality of life of the participants, and found significant increases in the scores. The questionnaire included aspects of asthma care, such as asthma symptoms, and thus, improvement in the quality of life is related to fewer respiratory symptoms.

### 6.3.2 Health care utilization

Health care utilization and hospitalizations were evaluated in three studies (Evers et al. 2013; Huang et al. 2008, 355; Patel et al. 2009, 32). Patel et al. (2009, 32) found a significant decrease in the amount of unplanned health care utilization and hospitalizations. Furthermore, as the intervention planned by Evers et al. (2013) was a marketing campaign, the researchers found that older people diagnosed with asthma and older people with recent respiratory symptoms reported seeing a health care professional as a result of the

campaign. Thus on the other hand, the amount of planned health care utilization increased. (Evers et al. 2013.)

### 6.3.3 Lung function

Some of the studies measured the lung function before and after the interventions with different tools, such as peak flow expiratory measurement or spirometer. Bozek et al. (2010, 163), Buist et al. (2006, 1085) and Gomieiro et al. (2011, 1168) found that the interventions improved the lung function of older asthmatics. However, Gomieiro et al. (2011, 1168) discovered that after their respiratory exercise program ended, the training was diminished significantly. This would suggest that the results on the lung function might not be permanent in all of the interventions.

### 6.3.4 Medication use

It seems that many of the studies in this review had some effects on the medication usage of the older asthmatics, either through improved self-management of asthma or increased emphasis on asthma medication during the intervention. After some interventions, the use of corticosteroid therapy increased (Patel et al. 2009, 31-32; Tousman et al. 2010, 81). Corticosteroid medication is often prescribed as the basic medication for asthma care, and thus this can be seen as positive outcome in the pharmacological management of asthma (Kauppi 2011b). However, another kind of results were reported by Huang et al. (2008, 355). They discovered that during the 6-month period of the study, the amount of medication types decreased significantly in their "individualized education with peak flow monitoring" group. In addition Gomieiro et al. (2011, 1167) found that the use of "rescue medication"

decreased. Naturally, these results would indicate that the control of asthma improved. Improvement in the adherence to medication therapy was also reported in three studies (Bozek et al. 2010, 163-164; Patel et al. 2009, 31-32; Tousman et al. 2010, 81). Furthermore, in relation to the medication therapy, the inhalation technique improved as a result of the study conducted by Buist et al. (2006, 1084-1085).

### 6.3.5 Self-management of asthma

The self-management of asthma in older adults was addressed in several of the studies included in this review. Specifically planned self-education programs (Huang et al. 2008, 352-353; Koch et al. 2004, 487-490; Tousman et al. 2010, 80-82) reported the most positive impacts on the subjects. The intervention group of Huang et al. (2008, 352-354) that consisted of individualized education with peak flow monitoring resulted in better self-care competence, behaviour and self-efficacy than the usual care group. In addition, the control of asthma improved in that group. It is notable, that also the individualized education group benefited from the intervention in terms of self-efficacy, as well as self-care competence and behaviours. The authors included skills and knowledge in the self-care competence. Components such as self-monitoring, medicine, environment control and exercise were included in both the asthma self-care behaviour and self-efficacy. (Huang et al. 2008, 352-354.) Tousman et al. (2010, 80-82) found that the learner-centred intervention for improved the self-efficacy of the older asthmatics significantly. The behaviour changes indicating improved self-management included increase in PEF measurement, asthma trigger management, medication use and learning more about asthma. In addition, the participants of the study increased e.g. the amount of physical exercise. (Tousman et al. 2010, 80-82.)

### 6.3.6 Self-management models

In the study of Koch et al. (2004, 487-490) three different self-management models were discovered: medical, collaborative and self-agency. These self-management models were formed based on the collaboration with the older asthmatics themselves. However, as this study aimed at discovering factors that affect the self-management of asthma in older age groups there were no reported outcomes for the older adults participating in the research. Nevertheless, the researchers found that especially the self-agency model might be beneficial in the care of older asthmatics, and thus, it could potentially have positive effects in the future.

### 6.3.7 Quality of life

Quality of life was assessed as an independent component in the studies of Buist et al. (2006, 1082-1083), Gomieiro et al. (2011, 1167) and Tousman et al. (2010, 81). All of them reported improved quality of life after the interventions. In the study of Buist et al. (2006, 1082-1083) the quality of life improved in both intervention groups and this change was also sustained. This improvement in the quality of life in both intervention groups might be due to the fact that the members of both groups were encouraged to seek further care if they felt necessary. Generally it could be stated that as quality of life probably consists of several different aspects in individual older adult's life, positive impacts on several of the evaluated outcomes could be seen as an improvement on the overall quality of life.

### 6.3.8 Asthma knowledge

Knowledge of asthma increased as a result of nearly all of the studies. The "Get Your Life Back" asthma social marketing campaign conducted by Evers et al. (2013) reached especially the older people who had an asthma diagnosis or had experienced respiratory symptoms recently. Older people who reported seeing the asthma promotion campaign, had better knowledge of asthma symptoms and triggers compared with those who had not seen the campaign. Thus, the general awareness of asthma in the older adults was also increased. Huang et al. (2008, 352-353) also reported significantly increased knowledge about asthma among the older adults, who had participated in the individualized education groups. Similarly, Tousman et al. (2010, 81) discovered that asthma knowledge after their intervention increased. Furthermore, Buist et al. (2006, 1085) discovered significant changes in the quality of life, as well as lung function among their intervention groups, which would suggest that there was an increase in the knowledge of the two groups, as they were able to control their asthma better.

### 6.3.9 Psychological outcomes

Tousman et al. (2010, 80-81) studied specifically the psychological outcomes of the learner-centred asthma self-management program on asthmatics. They discovered that their program produced positive impacts on the emotional function of the older asthmatics. In addition, the subjects also reported improved outcomes in other relevant aspects that affect the psychological coping, such as self-efficacy. Most importantly, the study reported improvement in depression among the subjects. Bozek et al. (2010, 163) also found that after one year of monitoring asthma in the older patients' their depressive symptoms were diminished. In addition, Mini-Mental State

Examination (MMSE) performed for the older participants demonstrated better scores after the intervention year.

# 7 Discussion

The main purpose of this research was to unearth what kind of interventions there are for older asthmatics that could be beneficial in the asthma management. In addition, the goal was to reveal what kind of outcomes these interventions have on the asthmatics. Nowadays, the emphasis in nursing research is set on evidence-based practice, and it implies on scientific, rational and proved practices (Ross 2012, 6-11). Thus, the purpose of this literature review was to provide nursing students, nurses and other health care professionals with research-based information that could be valuable in their care of older people with asthma.

Earlier studies have revealed that asthma in aged individuals often stays undiagnosed, and that the management is impeded with other concurrent illnesses and the altered physical and cognitive functions (Cousens et al. 2007, 729; Chotirmall et al. 2009, 901). In addition, it was unclear whether the same methods of asthma management that were used with children and younger adults with asthma would be relevant when working with older adults.

This literature review unearths interventions specifically directed at older adults, and thus, they could be straight utilized by other health care professionals working with aging asthmatics. In addition, the positive effects

of all of these interventions are stated in this review. The beforehand set research questions were also answered during the research process.

It should be noted, that the beforehand set research questions defined the scope of the processing of the literature, and the second question limits the results of this study to the positive outcomes of the interventions. Thus, it fails to open the factors that may have stayed unchanged after the interventions. It also poses a question, whether any type of active attention on chronic illness, such as asthma could have resulted in positive effects on the participants. In addition, it would be interesting to know whether the same interventions used in the management of asthma in children and younger adults can be efficient also with the older adults.

## 7.1 Reliability of the literature review

The reliability of a research is determined by how well the researcher presents the whole research process, and the reasons for the decisions made during it (Hirsjärvi, Remes, Sajavaara 2007, 226-228). In this review, the approach used in the literature search and the specific inclusion and exclusion criteria was an advantage considering the reliability of this research. In addition, the decisions made during this process were clearly presented and explained in this review. It was also beneficial that the literature search was conducted with key words that allowed the reviewer to explore materials as widely as possible. The validity of a study means the credibility and consistency between the explained methods and the gained results. It is also advisable to use several researchers in gathering and analysing the research materials. (Hirsjärvi et al. 2007, 227-228.) However, this review was conducted by only

one person, and thus it lacks the value that several researchers could have obtained.

There are very few asthma interventions that are aimed specifically at older individuals, and thus, these methods have been quite poorly explored. It limits the coverage of this literature review to the eight chosen studies, as it was impossible to accept interventions aimed at children and younger adults for the review. Originally, the writer planned to study specifically elderly asthmatics, but the different the definitions of the elderly meant that this would be quite impossible. These factors required the reviewer of this paper to compromise and derogate slightly from the original idea, that all of the interventions should be designed only for older asthmatics that are over 65 years old. Setting the suitable age group proved to be difficult, because of the wide variety of the definition of the age groups elderly or older adults. This problem also caused the writer to conduct the literature search twice in order to gain a better coverage of the literature. Finally, it led to the selection of studies that were aimed at individuals that were over 50 years old. However, some of the studies were also aimed at younger individuals, but the reviewer only chose one's that represented well the part of the older adults as subjects.

The reviewer wanted to exclude other literature reviews and only accepted original studies. This also limited the review materials. The interventions chosen for this review had very different approaches, and thus, the final synthesis was difficult to form. However, it was also possible to find similarities and draw conclusions based on the researches. These were mainly formed from the focus, emphasis and approaches used in the studies, as well as, the reported positive outcomes of the interventions.

## 7.2 Ethical considerations

Good scientific practice in conducting a research is defined by the Academy of Finland. It emphasises ethical principles, such as truthfulness in the research methods, as well as, in reporting the results. In addition, it is considered good scientific practice to report the entire process of the research thoroughly, starting from the planning of the research. (Academy of Finland Guidelines on Research Ethics 2003, 5-6.) In this literature review, the writer has attempted to follow these guidelines as thoroughly as possible in the presentation of planning the research, conducting the literature search and reporting the results of the research. In addition, the purpose of the reviewer was to answer the beforehand set research questions accurately. Thus, the ethical principles of good scientific practice were taken into account in conducting this research.

## 7.3 Conclusion and recommendations

This literature review uncovered a total of eight asthma interventions for older individuals, and it compiled them into an analysed summary. Many of the chosen interventions evaluated the self-management of asthma or asthma control with different variables and methods. In addition, individualized care was addressed in several of the studies.

All of the chosen studies reported positive impacts on the participants, except the study by Koch et al. (2004, 484), whose intervention explored different self-management models. Thus, it can be stated that such interventions can be effective in the management of asthma in the older adults. These positive effects included better self-management of asthma which contained factors such as improved medication therapy and inhalation technique, as well as,

better symptom and environment management. The general knowledge of asthma increased, and this understanding also affected the asthma control. In addition, the emotional functions and quality of life of the participants were better after the interventions.

The information gained from the reviewed studies can create a foundation for asthma management whilst working with aging individuals. Many of the interventions could be utilized as such by health care professionals, and thus, be taken in use when dealing with older asthmatics. However, some of the interventions would require a specific education to be conducted safely, e.g. the respiratory exercise program.

Generally, it would be necessary to research more about asthma care of the older adults, as the topic has been studied quite little earlier. One of the future research topics could be related to the general care, rather than specific interventions planned for asthmatics. This could especially add to the nursing care of these people. In the future, it would also be beneficial to further develop these interventions to address the possible obstacles, such as the inhalation technique in asthma management of the older adults better. However, the results of this literature review suggest, that interventions planned for older adults with asthma can have positive effects e.g. in terms of improved self-management, asthma control and quality of life.

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# Appendices

## APPENDIX 1. Characteristics of the studies in the literature review.

### 1 Authors, Year, Title

Bozek, A. & Jarzab, J. 2010. Adherence to Asthma Therapy in Elderly Patients.

### Aim / purpose

To evaluate the adherence to asthma therapy, as well as, explore the links between cognition, depressive symptoms, functional status and compliance.

### Methods

The adherence of elderly asthmatics was assessed using the Modified Morisky (MM) scale and visual analog scale (VAS). In addition, 1-year long monitoring by electronic diary, and assessment of medication usage was conducted.

### Central findings

The compliance to asthma therapy increased by the MM scale and VAS. Participants reported better asthma control as a result of the intervention.

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### 2 Authors, Year, Title

Buist, A.S., Vollmer, W.M., Wilson, S.R., Frazier, E.A. & Hayward, A.D. 2006. A Randomized Clinical Trial of Peak Flow versus Symptom Monitoring in Older Adults with Asthma.

### Aim / Purpose

To evaluate whether peak flow monitoring is more beneficial than symptom monitoring as a part of an asthma management plan.

### Methods

Participants were divided into two groups, of which another one used symptoms for asthma monitoring, and the other one peak flow rate. The participants received small-group classes, and were monitored for two years.

**Central findings**

There was no significant difference in the results of the two intervention groups. However, in both intervention groups the Asthma Quality-of-Life Questionnaire scores and lung function increased. In addition, the inhaler technique improved in both groups.

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**3 Authors, Year, Title**

Evers, U., Jones, S. C., Iverson, D. & Caputi, P. 2013. "Get Your Life Back": process and impact evaluation of an asthma social marketing campaign targeting older adults.

**Aim / Purpose**

To evaluate the effect of a social marketing campaign aimed at older adults about asthma awareness.

**Methods**

Intervention region and control region were evaluated with variables such as campaign awareness, recognition of materials and actions taken as a result of campaign. Furthermore, asthma knowledge, experience of asthma symptoms and general health were assessed among the regions.

**Central findings**

The social marketing campaign managed to reach those with diagnosed asthma or recent respiratory symptoms better, than other target groups. They reported seeing the campaign, and also taken action to control their symptoms as a result of the campaign. The asthma information line received more phone calls in the intervention community.

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**4 Authors, Year, Title**

Gomieiro, L.T.Y., Nascimento, A., Tanno, L.K., Agondi, R., Kalil, J. & Giavina-Bianchi, P. 2011. Respiratory exercise program for elderly individuals with asthma.

**Aim / Purpose**

To evaluate the effects of a respiratory exercise program planned for elderly individuals with asthma.

**Methods**

The lung function, respiratory and aerobic capacity, and quality of life of the participants were assessed before and after 16-week long respiratory exercise program.

**Central findings**

The respiratory exercise program resulted in significant increases in both inspiratory and expiratory pressures, and quality of life. In addition, the participants reported fewer respiratory symptoms. However, these positive outcomes were not completely sustained after the training was finished.

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**5 Authors, Year, Title**

Huang, T-T., Li, Y-T. & Wang, C-H. 2008. Individualized programme to promote self-care among older adults with asthma: randomized controlled trial.

**Aim / Purpose**

To evaluate the effects of individualized asthma self-care education programmes in older adults.

**Methods**

Participants were divided in three groups that received different types of asthma self-care education. The effects of these educational interventions were assessed in terms of different competencies related to self-care of asthma.

**Central findings**

The participants in the two individualized education groups reported higher asthma self-care competence and asthma self-efficacy, than the usual care group. In addition, the participants in the individualized education with peak flow monitoring group had higher self-care behaviour, self-efficacy and asthma control scores.

**6 Authors, Year, Title**

Koch, T., Jenkin, P. & Kralik, D. 2004. Chronic illness self-management: locating the "self".

**Aim / Purpose**

To explore how older people manage their asthma by themselves, and discover matters and obstacles that were significant for them in asthma management.

**Methods**

Interviews, open-ended questionnaire and action research groups were used as tools in gathering the data.

**Central findings**

Three asthma self-management models were discovered: Medical Model of Self-management, Collaborative Model of Self-management and Self-Agency Model of Self-management.

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**7 Authors, Year, Title**

Patel, R. R., Saltoun, C. A. & Grammer, L. C. 2009. Improving Asthma Care for the Elderly: A Randomized Controlled Trial Using a Simple Telephone Intervention.

**Aim / Purpose**

To evaluate the effectiveness of a telephone intervention in improving asthma care in elderly people.

**Methods**

Questionnaires were performed for elderly asthmatics via telephone. The intervention group was presented with asthma-related questionnaire, and the control group received questionnaire related to general health.

**Central findings**

The corticosteroid medication use of the intervention group increased as a result of the program. In addition, the intervention group reported less emergency department visits than the control group.

**8 Authors, Year, Title**

Tousman, S., Zeitz, H. & Taylor, L.D. 2010. A Pilot Study Assessing the Impact of a Learner-Centered Adult Asthma Self-Management Program on Psychological Outcomes.

**Aim / Purpose**

To evaluate the psychological effects of asthma self-management program for adults.

**Methods**

Small group meetings that included e.g. discussion and problem solving were organized. In addition, the participants received homework consisting of behavioural change activities.

**Central findings**

The study reported significant improvements in quality of life, self-efficacy and depressive symptoms. Furthermore, the knowledge and health behaviour of the participants increased.