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Self-management intervention among adult patients with Chronic Obstructive Pulmonary Disease

A descriptive literature review

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Abstract

Background: Chronic obstructive pulmonary disease became more and more universal all over the world, which affects the quality of life of patients. Combined Orem's self-care deficit theory with this study, to research and discuss different self-management interventions and compare those self-management interventions for making sure whether they were meaningful. It was important for nurses to give interventions or provide help to reach self-management interventions to every patient.

Aim: To describe self-management interventions among adult patients with chronic obstructive pulmonary disease.

Method: 21 Scientific articles with quantitative design, qualitative design and mix-methods researches were searched in the databases Medline, Cinahl what were chosen consistent with the theme and purpose. In the end, 12 articles were used to review the results.

Results: The studies were based on 8 different countries including China, Spain, Korea, UK, Australia, Norway, Netherlands and Denmark. The interventions included education, exercise, telemedicine, supervise or monitor, the outcomes were health belief and self-efficacy, tolerance of exercise, health-related quality of life and exacerbation and hospital readmission.

Conclusions: Nursing interventions effected some patients with chronic obstructive pulmonary disease not all patients. The education helped do health plan to reduce hospital readmission rate or mortality and the exercise effect on pulmonary function or pulmonary rehabilitation. Patients and medical staff were required to supervise or monitor together.

Keywords: Chronic obstructive pulmonary disease, nursing, self-management intervention

摘要

背景：慢性阻塞性肺病在世界范围内越来越普遍，影响了患者的生活质量。作者研究探讨了不同的自我管理干预措施并进行了比较，以确定它们对患者是否有意义。

目的：描述慢性阻塞性肺病成年患者自我管理干预的情况。

方法：文献采用定量，定性和混合型设计。在数据库 Medline 和 Cinahl 中选了符合的文献，最后用 12 篇来研究结果。

结果：研究基于 8 个不同的国家。干预措施多种多样，干预效果也从不同方面来体现。

结论：护理干预对部分慢性阻塞性肺病患者有影响。

关键词：慢性阻塞性肺病，护理，自我管理干预

Appendix 1 Table 3. Overview of selected articles
Appendix 2 Table 4. The aims and the results of the selected articles

1. Introduction

1.1 The situation of Chronic obstructive pulmonary disease

Chronic obstructive pulmonary disease (COPD) is a threatening lung disease involving life, leading to difficulty in breathing and deterioration of the disease and serious diseases (world health organization, WHO, 2016). With the change of air quality and the aging of the population all over the word, the prevalence of COPD is getting higher than before. According to the global disease burden study, 251 million cases of global COPD patients were diagnosed in 2016 (world health organization, WHO, 2016). The burden of COPD is expected to increase due to the aging population and persistent exposure to the risk factors of chronic obstructive pulmonary disease. In order to reduce the burden of patients and society, how to improving the effective of care quality become more and more important. Self-management has become more and more important (Korpershoek *et al*., 2016), several kinds of methods could be improve the quality of care (Cramm *et al*., 2013). The literature has been found that self-management intervention is related to many related factors in adult patients with chronic obstructive pulmonary disease having different effects (Cramm *et al*., 2013). Chronic obstructive pulmonary disease (COPD) deteriorates acutely from time to time. Most COPD patients have an average acute exacerbation three times of a year, which is why COPD patients are hospitalized. Due to chronic obstructive pulmonary disease (COPD) is irreversible, the health-related quality of life (HRQOL) of many patients with COPD is low. Optimizing HRQOL and reducing hospitalization have became the key priorities of COPD management, and self-management helps a lot (Newham *et al*., 2017).

1.2 Definitions for self-management intervention, chronic obstructive pulmonary disease and adult patients

1.2.1 Self-management intervention – definition

The self-management intervention can be regarded as others provide measurements to support patients conduct the management of the individual itself, approach to their own goals, thoughts, psychology and behavior and so on, which also be described to organize themselves, to manage themselves , to motivate themselves, and to achieve the goal of self-struggle (Newham *et al*., 2017). Self-management interventions in multiple treatments provided by a health care worker significantly improved the patient's condition as well as the patient's health-related quality of life (Newham *et al*., 2017). In recent years, interventions to improve self-management behaviors have attracted wide

attention as a stochastic factor and the key goal is to change healthy behaviors and enable patients to have an active participation in disease management skills (Korpershoek *et al*., 2016).

1.2.2 Chronic obstructive pulmonary disease - definition

Chronic obstructive pulmonary disease (COPD) is an incurable chronic disease which diagnosed with the inclusion criteria were as follows: FEV1/ FVC $\leqslant$ 70% according to the GOLD (Wang *et al*., 2016). Meanwhile, the COPD is one of the main causes of morbidity and mortality all over the world (Benzo *et al*., 2016a). Due to the long-term treatment process and physical activity restriction, adapted to living with COPD often leads to negative emotions (Benzo *et al*., 2016b). Due to the effects of psychological and physical on patients, such as dyspnea, anxiety and depression, the COPD influenced the activities of patients and the quality of life seriously (Wang *et al*., 2016).

1.2.3 Adult patients - definition

The patient is the person who is ill, receive treatment and care (Newham *et al*., 2017). Based on pooled estimates from six WHO regions, the global prevalence of physiologically defined COPD in adults aged $\geqslant$ 40 years is 9% - 10% (Zwerink *et al*., 2014), so in this review, the age of adult patients are over 40 years old.

1.3 The nurse's role

In the treatment of COPD, pulmonary rehabilitation is regarded as the cornerstone of the treatment, and it is also as an indicator of therapeutic effect, which has been shown in many studies. Generally, lung rehabilitation programs include exercise training, education, nutritional supplements and psycho - social support (Newham *et al*., 2017), but it is not means the effect just showed by pulmonary rehabilitation. In the research, different evaluation criterion be summarized based on the same aim and which provide a meaningful reference value for nurses to provide self-management. In addition to lung rehabilitation, the reducing readmission rates and promoting health-related quality of life through the way of chronic respiratory questionnaire, 6-min walk distance and so on also showed the consequences (Kruijssen *et al*., 2015). One literature (Wang *et al*., 2016) has been mentioned that patients carry out self-monitoring under the telemedicine by nurses, while cooperating with the completion of self-management diaries to facilitate nurses to assist and supervise. The role of a nurse is to guide COPD adult patients, explain the necessity and responsibility of self-management, and plan for self-

management. Nurses can also educate patients to urge them to build awareness of health education by their families and themselves (Kruijssen *et al*., 2015), and support for adult patients' telerehabilitation, promoting and improving the self-management skills of adult COPD patients, and have independent supervision and management (Cameron-Tucker *et al*., 2016). From the discharge of patients, nurses communicate with all patients on real-time video every day. This approach is considered a simple way to connect with health professionals. Nurses provided monitor, feedback and advice to patients which is often be regarded as a dose of good medicine to provide patients with a sense of security to help patients take better care of themselves (Wang *et al*., 2016).

1.4 Nursing theory

This study is supported by Orem' self-care deficit theory of nursing (Alligood & Tomey, 2014, P240). As Orem said that individuals cannot continue to provide themselves with the necessary help in the presence of obstacles, so they need to take care of themselves (Orem, 2001, p20). This theory includes self-care, which means the persons who have ability to draw a plan and put it into practice and be responsibility for them. According to the degree of individual self-care defects, three kinds of nursing compensation systems were designed: 1) nursing to give comprehensive help, 2) nurses to nursing, patients to improve their own nursing ability, 3) nurses to help patients to learn so that patients can take care of themselves (Orem, 2001, P20). Self-management in patients with chronic obstructive pulmonary disease is similar with self-care in Orem' theory. In Orem's opinion, the nursing systems are series of meaningful practical actions, while nurses in coordination with patients, they need comprehend the patients' demand to provide support to patients achieve self-care (Alligood & Tomey, 2014, p246). Taking the Orem' theory as theoretical framework, evaluated patients 'disease, adopted supportive education system and make patient participate nursing activity or nurses support to patients' self-management (Alligood & Tomey, 2014, p248). In the research, self-management training can play an important role. The role in this area, and increasingly available to patients with chronic obstructive pulmonary disease, is regularly combined with exercise programs. The goal of self-management is to teach patients the skills they need. Medical programs that exclude specific diseases can be directed by nurses to change behavioral to help patients control their condition and improve their health (Zwerink *et al*., 2014).

1.5 Earlier reviews

Nursing intervention of self-management was a long-term research topic and has been explored by researchers. Self-management interventions could take a variety of forms, including health belief-model (HBM) based on nursing intervention, self-management programme of activity, coping and education for COPD (SPACE for COPD), telemedicine and so on, which often combined with a sports program or an optimized care plan. During the experiment, due to the length of the follow-up time, it was sometimes difficult to determine the most effective part of it (Newham *et al*., 2017). Self-management intervention help (COPD) patients with chronic obstructive pulmonary disease gain and practice the specific disease-specific drug therapy they need, guide changes in healthy behavior, and provide emotional support for the fighting against the disease but not all interventions are effective for a certain period of time which made the researchers put forward their own thinking: self-management intervention to help patients at the same time may be affected by what factors lead to unsatisfactory results (Zwerink *et al*., 2014). According to Orem's self-care deficit theory, self-care was focused on nursing, as predecessors had said that self-management sometimes required the guidance of nurses to supervise. Nurses provided help to improve self-care ability to compensate for deficiencies in self-care management while meeting patients' self-care needs, which included general self-care needs, such as tolerance to exercise; developmental self-care needs, such as reducing the severity of illness and reducing the hospital readmission; and self-care needs with poor health, such as resistance to anxiety and depression to improve health related quality of life (Alligood & Tomey, 2014, p248).

1.6 Problem statement

Chronic obstructive pulmonary disease has gradually become a serious problem and has attracted the attention of society. Self-management plays an important role in the condition of patients, more and more researches indicate that self-management becomes more meaningful than before, it's necessary for patients to reduce rate of readmission, reduce the mortality and improve quality of life. At present, some researches come up with self-management program such as health professionals educate the adult patients to do self-management, due to self-management presents as self-monitoring, self-assessment, self-control. More specifically, nurses or anyone else provide telemedicine to adult patients maintain healthy behaviors and lifestyles, assess their own physical quality and reduce the degree of dependence on health professionals. Having a variety

of the method of self-management with different degrees and abilities of self-management, it is not enough to promote self-management inadequately. A shortage of cognition of COPD, adult patients' education level and other factors also cause this condition. Therefore, it is important to describe self-management intervention among adult patients with COPD.

1.7 Aim and research questions

The aim of the literature review was to describe self-management interventions among adult patients with COPD, and the research question was:

-What Self-management interventions could help adult patients with COPD?

2. Methods

2.1 Design

Descriptive literature review was used in the study (Polit & Beck, 2017).

2.2 Database and Search strategy

Articles have been found by searching in the databases both PubMed and CINAHL with limitations (5 years, English, Humans, Full text, University of Gävle) as showed in Table 1. The search terms were used self-management, intervention, adult patients and COPD, one by one, and combined with them which used Boolean terms (AND). In the primary search the titles and abstracts of 188 articles were skim-read and 12 articles were selected to be potential articles.

Table 1. Results of database searches

Database Data of search	Limits	Search terms	Number of hits	Potential articles(excluding doubles)
Pubmed 2018-05-26	5years, Humans, English, Full text	COPD (Mesh)	11225	
Pubmed 2018-05-26	5years, Humans, English, Full text	"self-management" AND "intervention" AND "COPD (Mesh)"	285	

Pubmed 2018-05-26	5years, Humans, English, Full text	"self-management" AND "intervention" AND "adult patients" AND "COPD(Mesh)"	181	11
Cinahl 2018-05-26	5years, Human, English, Full text	COPD	1040	
Cinahl 2018-05-26	5years, Human, English, Full text	"self-management" AND "intervention" AND "COPD"	23	
Cinahl 2018-05-26	5years, Human, English, Full text	"self-management" AND "intervention" AND "adult patients" AND "COPD"	7	1
				Total: 12

2.3 Selection criteria

In this review, articles were mainly discovered by PubMed and Cinahl. The inclusion of articles included in a degree program were: 1) scientific articles conform to the aim which related with self-management interventions among adult patients with COPD and which should be answered the research question, 2) articles were quantitative researches, qualitative researches and mix-methods researches. The exclusionary criteria for articles selected were: 1) the interventions without mentioned self-management, 2) the articles didn't answer the research question, 3) articles mentioned others chronic diseases, 4) reviews.

2.4 Selection process and outcome regarding possible articles

First, enter the search terms, limited the scope of articles. Looked up the relevant literature, the titles and abstracts of the articles were read first to determine whether they are helpful to answer the research questions of this review. Then examined the full text carefully and determined whether it was closely related to the topic of the review and screened out useful articles. In this review, every step of the selection process was illustrated in detail. After the article was searched by one person, another person checked the article again and confirmed the availability of the article. In the preliminary search, according to PubMed, 181 articles' titles, abstracts were skim-read, 21 articles

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were potential. According to Cinahl, 7 articles were skin-read, 1 article was potential. At last, combined with articles were selected from PubMed and Cinahl total 21 articles related to the aim and research questions. After a reading 21 articles with criteria, finally, 12 articles which were selected see **Figure 1.**
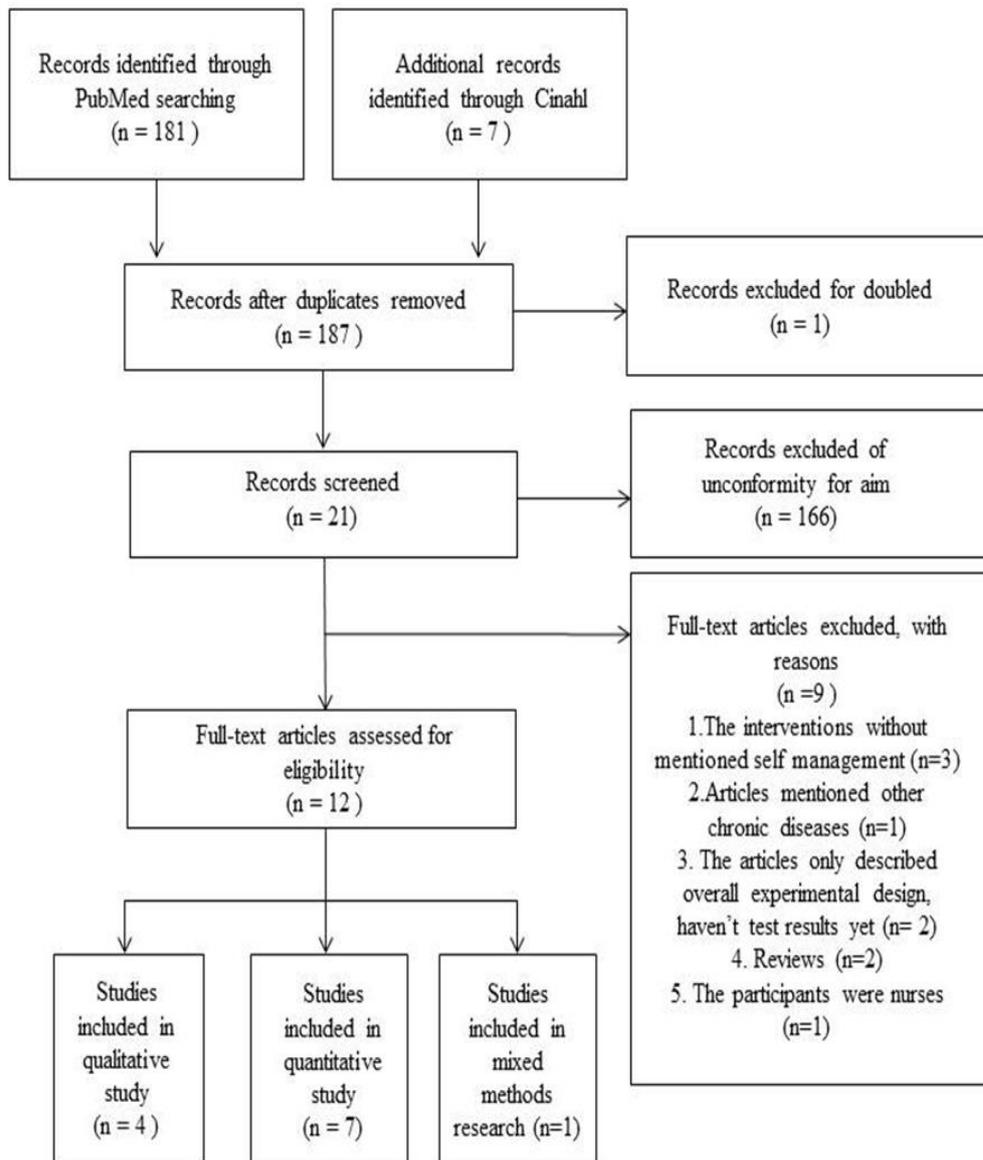
Figure 1. Flowchart for the selection of eligible articles

2.5 Data analysis

Articles related to the topic which described self-management intervention among adult patients with COPD included. The main descriptive details of the study were analyzed, including the author, purpose, title, design, participants, data collection methods, data analysis methods and results (Polit & Beck, 2017). All of collected information would extract from experimental results or interview results indirectly (Polit & Beck, 2017). Polit and Beck (2017) thought that all information could be expressed in an obvious

way, such as the representation of chart. In this research, the selected articles were divided into two forms to show the basic content, one talked about authors, year/country of publication, title, design or approach, participants, the method of data collection and data analysis, another showed about aim and results. The authors of this research read selected articles amply and checked whether these articles accorded with this research's aim and answered research questions of this study, meanwhile, whether were consisted with data selection. The findings were classified according to the intervention methods, intervention effects about different self-management among adult patients with COPD (Polit & Beck, 2017). At the same time, after collecting data in a logical order, it was possible to use encoding or tables. In this study, tables were used to analyze different items to confirm if they were conformed to the theme to ensure the validity and feasibility of data (Polit & Beck, 2017).

2.6 Ethical considerations

It was particularly important to observe morality. In the process of research, not paying enough attention to morality led ethical norms were violated frequently, or ethical dilemmas were caused by conflicts with research objectives (Polit & Beck, 2017). Therefore, in this review, each selected article had been read carefully with fully understood. The view of the articles of the articles' results was described objectively and correctly, without being influenced by authors of this review' own opinions and subjective attitudes. The results would not violate the authors of this review' willing, and analyzed the results correctly without plagiarism.

3. Result

Results in the study were described according to original studies from 12 different countries. The part of result divided into study characteristics, samples characteristics, self-management intervention about three items: education and exercise, telemedicine (TM), supervise/ monitor, and outcome synthesis about four items: health belief and self- efficacy, tolerance of exercise, health-related quality of life (HRQoL), exacerbation and hospital readmission.

3.1 Study characteristics

The characteristics of studies of design, participants, data collection methods and data analysis methods were described in table 3. The studies were based on eight different countries in Australia (Blackstock *et al*., 2013), China (Wang *et al*., 2013), Denmark (Nissen *et al*., 2017), Korea (Lee *et al*., 2014), Netherlands (Zwerink *et al*., 2015), Norway (Barken *et al*., 2017; Laue *et al*., 2017; Vatnøy *et al*., 2016), Spain (Sánchez-

Nieto *et al*., 2016) and United Kingdom (Apps *et al*., 2013; Billington *et al*., 2014; Johnson-Warrington *et al*., 2016). All studies included seven quantitative articles, one article from Australia (Blackstock *et al*., 2013), one from China (Wang *et al*., 2013), two from United Kingdom (Billington *et al*., 2014; Johnson-Warrington *et al*., 2016), the rest of studies from Korea (Lee *et al*., 2014), Netherlands (Zwerink *et al*., 2015) and Spain (Sánchez-Nieto *et al*., 2016); four qualitative articles which from Norway are three (Barken *et al*., 2017); Laue *et al*., 2017; Vatnøy *et al*., 2016), the rest one from Denmark (Nissen *et al*., 2017) and one mixed method articles from United Kingdom (Apps *et al*., 2013). The sample size of studies was from 10 (Barken *et al*., 2017; Vatnøy *et al*., 2016) to 267 (Blackstock *et al*., 2013) participants and a total of 1116 patients participated in the 12 studies.

3.2 Samples characteristics

Participants were recruited from different hospitals or other organization. The inclusion of studies was who diagnosed with COPD, in addition, four studies based on patients with AECOPD (Laue *et al*., 2017; Sánchez-Nieto *et al*., 2016; Wang *et al*., 2013; Zwerink *et al*., 2015), participants weren't uneducated person and had certain right to know test. Exclusion based on that participants were diagnosed with other diseases, such as asthma, advanced heart failure, terminal disease, dementia, or uncontrolled psychiatric disorders, participants joined in other rehabilitation programme, communication between participants and researchers was hindered. The age of inclusion was from 40 years old to 83 years old, the mean age was from $63.1\pm7.9 \sim 72.09\pm9.24$. Gender of all studies had no significant differences.

3.3 Self-management intervention

3.3.1 Education and Exercise

There were eight studies involved education and exercise (Apps *et al*., 2013; Billington *et al*., 2014; Blackstock *et al*., 2013; Johnson-Warrington *et al*., 2016; Laue *et al*., 2017; Sánchez-Nieto *et al*., 2016; Wang *et al*., 2013; Zwerink *et al*., 2015). Nursing intervention based on health based model (HBM) may promote preventive health behaviors and improve quality of life, and the education involved tips on oxygen therapy, breathing skills, diet management, the importance of quitting smoking which showed as some treatments based on HBM include: 1) to help patients understand the susceptibility and severity of COPD, 2) to help patients realize the benefits of COPD treatment and the start of healthy behavior, 3) to help patients avoid bad behavior to

develop health behaviors, 4) to improve confidence in COPD management, 5) to improve alertness (Wang *et al*., 2013).

As for exercise, one article (Blackstock *et al*., 2013) was based on the 6 minute walk distance to measure functional exercise ability which did not provide significant improvement in the short term, but long-term interventions helped patients with dyspnea and fatigue. One article carried out basic physical exercises for patients, after the exercise intervention, the number of patients with exacerbation of COPD decreased (Sánchez-Nieto *et al*., 2016). The article (Johnson-Warrington *et al*., 2016) established a family-based exercise program for patients, which included aerobic walking every day, resistance training for upper limb and lower limbs three times a week, these exercises increased readmission intervals, reduced mortality and helped patients better organize their life to cope with COPD. In the article (Wang *et al*., 2013), the exercise showed as training of breathing skills, participants got a book for improving breathing skills.

The article (Blackstock *et al*., 2013) added education to progress of pulmonary rehabilitation, the study came up with exercise training intervention (ET) and invited professional to provide help for participants and offer education pamphlet to guide participants do ET. Nursing intervention was to provide a summary of self-management information received by patients and answered any specific questions about the use of self-management plans to manage symptoms and initiate the use of emergency drugs (Billington *et al*., 2014). The detailed described of how to use drug was showed in other study (Laue *et al*., 2017). All patients participated in self-management meetings to change patient's disease behavior by increasing knowledge with purpose of improving patients' awareness of COPD (Zwerink *et al*., 2015). In the article (Sánchez-Nieto *et al*., 2016), self-management procedures had been developed which included main features of the disease, worsening symptoms and inhalation drugs, a physiotherapist demonstrated how to do a series of basic physical exercises. Even more, the article (Apps *et al*., 2013) came up with self-management programme of activity, coping and education for chronic obstructive pulmonary disease systematically and integrally to improve the education for patients with COPD.

3.3.2 Telemedicine (TM)

There were five articles refer to telemedicine (TM) (Barken *et al*., 2017; Billington *et al*., 2014; Nissen *et al*., 2017; Vatnøy *et al*., 2016; Wang *et al*., 2013). Nurses regularly offered advice on lifestyles such as quitting smoking, exercising or losing weight, and occasionally discussed if patients had special problems or concerns by telemedicine,

which meant that nurses assessed the patient's self-reported health on the phone and offered suggestion if the patient was worried he or she needed go to the clinic (Billington *et al*., 2014). Due to evaluated the results better, the scores of the COPD Assessment Tool (CAT) had been improved, which was regarded as a significant change of clinical (Billington *et al*., 2014). The intervention of the article (Vatnøy *et al*., 2016) included a technical solution and follow-up through telemedicine center. The technical solutions included: 1) tablets equipped with video cameras and pulse oximeters for wireless delivery to tablets, 2) software consisting of questionnaires to measure subjective symptoms, 3) symptom checklist. On the positive point, patients responded that the experience of TM was understandable and manageable, and provides meaning in everyday life which reflected in that TM interventions could help reduce the burden of disease, made life as normal as possible, and helped patients to be independent and self-managed (Vatnøy *et al*., 2016). On the negative point, some participants more believed pulse oximeter interfered with personal space, than in the intention of TM intervention, and described they did not get any benefits. Those in good health considered daily exposure to TM a burden and the waste of time (Vatnøy *et al*.,2016). Patients' self-management skills and well-being were improved by contacting professional nurses about COPD, who provided consultations, responded to changes in patients and took appropriate action to give patients a sense of security and a sense of control over their illness, while at the same time being more aware of their illness (Nissen *et al*., 2017).

One article (Barken *et al*., 2017) also reported that patient received TM equipment at home when discharge. The technology performed as same as the article (Vatnøy *et al*., 2016) included a flat panel with a camera and a pulse oximeter for daily heart rate and oxygen saturation measurements, which were wirelessly transmitted from tablet applications to telemedicine centers (Barken *et al*., 2017). Interventions included daily contacts between patients and trained TM nurses, assessment of disseminated health data and follow-up video communication (Barken *et al*., 2017). As for the article (Wang *et al*., 2013), the participants were followed up by telephone every two weeks for the first month after out of hospital, after that, followed it for three months and six months to provide individualized nursing intervention to help patients control themselves to improve health-related quality of life.

3.3.3 Supervise/Monitor

In one study (Zwerink *et al*., 2015), participants were trained to keep a daily diary, in which they had to record their main symptoms (dyspnea, expectoration, sputum color) and minor symptoms (cough, wheezing, runny nose, sore throat, fever) to monitor their own condition, the study showed that self-intervention within self-treatment was very important. Timely self-treatment slowed down the rate of deterioration, medical expenses had been significantly reduced, and which resulted in significant savings in medical costs (Zwerink *et al*., 2015). The "symptom diaries" and "action plans" were designed to train patients to identify symptoms which were deteriorated, to monitor themselves at every time, and to act quickly to start using related drugs. Due to the timely start of treatment, the deterioration of the disease was slower than before and the symptoms were alleviated (Zwerink *et al*., 2015).

In the study (Wang *et al*., 2013), the content of monitor were diet control, smoking management, keep oxygen therapy and training of breathing skills. Pulmonary function status also showed the effective effect in self-management of patients with COPD, the self-control in intervention group promoted the pulmonary function status better than controlled group. The monitor based health belief model was beneficial to heath belief and self-efficacy (Wang *et al*., 2013). As for respiratory status, activities of daily life (ADL), six-minute walking distance (6MWD), which may be improved by self-monitor. These results supplied new thinking for self-management of COPD patients. As the article (Nissen *et al*., 2017) said, self-monitoring could help patients improve their awareness of their condition.

One article (Lee *et al*., 2014) referred to problem solved therapy (PST) which provided a personalized intervention by nurses for 12 phone calls to each patient every two weeks for six months, it meant nurses supervising patients to monitor themselves to improve the self-efficacy of patients and reduce depressive symptoms. Although the results in this study, PST intervention guided by nurses had no significant effect on self-efficacy and depressive symptoms of COPD patients, but the based on the purpose of the PST program which was to improve patient evaluation of the problem and be acted as a useful challenge or opportunity to help patients believe that the problem could be solved within their capabilities (Lee *et al*., 2014). Therefore, it is necessary to explore the effective of PST intervention guided by nurses on self-efficacy and depressive symptoms of patients with COPD.

3.4   Outcome synthesis

Looking back on these 12 articles, this research summarized four items to express the results, and expounded the benefits classify under different conditions (see table 2).

3.4.1   Health belief and self-efficacy

One article showed the scores of health belief and self-efficacy in the group receiving health belief model based nursing intervention were significantly higher than those in the control group (Wang *et al*., 2013). Another article also showed problem solved therapy intervention improves self-efficacy (Lee *et al*., 2014).

3.4.2   Tolerance of exercise

In the article (Wang *et al*., 2013), results showed that there were significant differences in dyspnea score, 6 minute walking distance and activities of daily life (ADL) score between the two groups the intervention could improve exercise tolerance. As for the article (Apps *et al*., 2013), self-management programme of activity, coping and education for COPD (SPACE for COPD) enhanced tolerance of exercise.

3.4.3   Health-related quality of life (HRQoL)

There were eight articles about HRQoL (Barken *et al*., 2017; Billington *et al*., 2014; Blackstock *et al*., 2013; Laue *et al*., 2017; Lee *et al*., 2014; Nissen *et al*., 2017; Vatnøy *et al*., 2016; Zwerink *et al*., 2015), there was no significant difference in the effect between the lung rehabilitation with education and without education which proved that education had no significant effect on lung rehabilitation (Blackstock *et al*., 2013). In the article (Zwerink *et al*., 2015) found patients in the self-management group had fewer visits to respiratory medicine and emergency departments than those in the general group. From 5 articles' (Barken *et al*., 2017; Billington *et al*., 2014; Laue *et al*., 2017; Nissen *et al*., 2017; Vatnøy *et al*., 2016) perspective, telemedicine with self-monitoring and self-treatment could help reduce the stress of life caused by disease and make life as normal as possible. Health-related quality of life also related to depressive symptoms which leaded to a negative impact. As one article (Lee *et al*., 2014) said, the purpose of problem solved therapy (PST) which meant provided a personalized intervention by nurses encourage patients to adopt positive problem-orientation and reasonable problem-solving methods, through PST by nurses-led, the depressive symptoms decreased.

3.4.4 Exacerbation and hospital readmission

In the article (Zwerink *et al*., 2015) which with 2 years follow up, self-management plan could lead to fewer exacerbation days, less severe exacerbation, and for one article (Sánchez-Nieto *et al*., 2016), with 1year follow up the acute exacerbation of COPD or hospitalization rate decreased in the intervention group. However, within 3 months follow up, there was no difference in readmission rates or mortality rates for supported self-management patients (Johnson-Warrington *et al*., 2016).

Table 2. self-management intervention and outcomes

12articles(used references to represent)	The self-management items that articles talked about			Outcomes (if in special condition would signed it, such as short follow-up)			
	Exercise and Education	Telemedicine	Supervise/Monitor	Health belief and self-efficacy	Tolerance of exercise	Health-related quality of life	Exacerbation and hospital readmission
Apps et al., 2013	✓				✓		
Barken et al., 2017		✓				✓	
Billington et al., 2014	✓	✓				just showed benefits in primary intervention	
Blackstock et al., 2013	✓					✓	
Johnson- Warrington et al., 2016	✓						No benefits during 3 months follow up
Laue et al., 2017	✓			✓			
Lee et al., 2014			✓	✓			
Nissen et al., 2017		✓	✓			✓	
Sánchez-Nieto et al., 2016	✓						✓
Vatnøy et al., 2016		✓				✓	
Wang et al., 2013	✓	✓	✓	✓	✓		
Zwerink et al., 2015	✓		✓			✓	✓

"√" in outcomes meant that the intervention has a significant effect on the corresponding indicators

4. Discussion

4.1 Main result

The goal of this study was to describe self-management interventions among adult patients with COPD and summarize what self-management interventions may help patients. In the 12 articles, based on different self-management provide evaluation

criterion which included lung rehabilitation, readmission rates and health-related quality of life, depression score and so on, through different assessment tools of chronic respiratory questionnaire, 6-min walk distance etc showed the consequences. The results showed that education, exercise, telemedicine and supervise/monitor were meaningful for some patients with COPD under certain conditions.

4.2 Result Discussion

4.2.1 Education and Exercise

Nursing intervention based on health belief model (HBM) recognized the value of HBM based nursing interventions in improving patients' health pointed out that education and exercise joined to self-management by nurses was essential, be similiar to Wang *et al* (2013). However, one article about a self-management program of activity, coping, and education for COPD (SPACE for COPD) suggested that readmission rate not decrease in a short period of time (Johnson-Warrington *et al*., 2016). This research found there was no significant difference between lung rehabilitation with specific education and lung rehabilitation without specific education through assessment of quality of life, the reason for this outcome was incomplete of follow-up results (Newham et al., 2017; Zwerink et al., 2014), this reason be mentioned in early reviews without the conclusion about unsatisfactory results, therefore in this study draw the conclusion that the effectiveness of self-management was sometimes manifested in a specific range. Judging from the outcome indicators, this research indicated that all results showed by FEV1 / FVC ratio, dyspnea scale, 6-minute walking distance between intervention group and control group, some articles mentioned COPD assessment tool (CAT) to display results, the results through discussed showed different effects would be affected by the degree of participation and characteristics of sample. As described in previous reviews (Zwerink *et al*., 2014), all of content described above led up to results influenced by length and integrity of follow ups, evaluating indicators. As Orem's self-care deficit theory said, education and exercise had defect, the education level of patients and unable to understand the content of education, exercise was not in place which also were mentioned in articles (Blackstock *et al*., 2013; Johnson-Warrington *et al*., 2016; Wang *et al*., 2013) influenced results.

4.2.2 Telemedicine (TM)

Telephone intervention provided effective assistance for patients. On the one hand, this review study showed that the experience of telemedicine was understandable and

manageable for all patients with COPD and telemedicine helped reduce the burden of disease and made life as normal as possible, as same as early review (Newham *et al*., 2017) mentioned, because accepted telemedicine intervention patients was based on specialized training, the sample was small, so the effects were not extensive. Especially in this review study, that the results about telemedicine intervention most be relevant to experience of patients by interviews, the interviews influenced by the time and content of interview, the number of problems, environmental factors. As the previous article (Newham *et al*., 2017) suggested, while there was little difference between the results, the need for flexibility in devise experiments or interviews was necessary. As for nurses who provide telemedicine, four articles (Barken *et al*., 2017; Billington *et al*., 2014; Nissen *et al*., 2017; Vatnøy *et al*., 2016) presented that these nurses were qualified for chronic disease management which accord with Orem' self-care deficit theory of nursing, the core of self-care needed nurses supply help to ensure that patients have basis for making decision, setting goals of their own choice, and making them aware of their role in self-care. The regular support and contact with telemedicine nurses could better track the unpredictable changes and limitations of the patient's body.

4.2.3 Supervise/ Monitor

In this study have been found that patients with COPD' Self-care needed nurses provide help, as one article described that the supervise or monitor to assist COPD patients could help the patient find the change of their condition in time, at the same time made the nurse get the patient's information in time to help the patient quickly and timely. In the previous review (Zwerink *et al*., 2014) got conclusion that chronic obstructive pulmonary disease (COPD) patients benefited from self-management in the long term by using an action plan based on supervise or monitor to reduce the duration and severity of the exacerbation. It's similar that the conclusion was drawn in this research study. And patients with COPD were recommended self treatment need more supervise or monitor (Zwerink *et al*., 2015). Combined with Orem' self-care deficit theory of nursing, Besides, the patients under HBM based nursing intervention with psychological support by nurses reduced the level of depressive caused by COPD, meanwhile, under the supervised by nurses, patients were more motivated to deal with the disease.

4.2.4　Methods discussion

No matter in which country, in the past few years or in recent years, literature review was a good way to critically examine and summarize previous studies. As a comprehensive report, it could analyze, identify and summarize previous articles well (Polit & Beck, 2017). According to Polit & Beck (2017), this study used clear and specific inclusion and exclusion criteria. Firstly, one of the criteria chosen by this study was that the article met the purpose of self-management intervention for adult COPD patients and should answer research questions, which might be regarded as an advantage and limitation. The limitation was that only the inclusion of adult COPD patients in the research criteria would make the this study miss the help and expansion of good research for other age groups. However, it also has its advantages. Limiting the age range was more pertinent for this research. It's more consistent with the results of the research questions that the accurately of research was higher. Secondly, this study chose the interventions of articles without mentioned self-management as a exclusionary criteria, on the one hand, it could help this study focus more on the self-management of COPD patients, to make this study more relevant to the subject. On the other hand, this also made the this study have some limitations in the expansion of their own illness. What's more, the review ruled out articles referring to other chronic diseases.In general, methods had advantages and disadvantages, but most of them were advantages which could help the authors of this study to answer the research questions better and more correctly.

4.3　Clinical implications

This review study consults the literature about self-management of chronic obstructive pulmonary disease patients in the past five years in different databases. Most of the education and exercise intervention have positive significance for COPD. Telemedicine intervention is dominated by the relevant medical staff. By summarizing and discussing all early articles, it can be seen that telemedicine intervention plays a role in patients. Supervision and monitoring can remind patients to pay attention to self-management when necessary. Generally, education, exercise, telemedicine and supervise or monitor were inseparably interconnected.

This review will give COPD patients a better understanding of what measures help improve their survival rate. Through this review, nurses can also choose more clearly and take effective measures to help COPD patients.

4.4 Suggestions for future research

Comparing different literatures, this research find that patients with chronic obstructive pulmonary disease often experience anxiety and depression, which affect their lives. The weakening of lung function will affect the deterioration of their condition and lead to the increase of re-admission rate. Therefore, it is very important to pay attention to the mental health of the patients and strengthen the lung function exercise. In the future research, focus on the mental health and pulmonary function exercise of patients with chronic obstructive pulmonary disease (COPD) is necessary, this provides a favorable direction for nursing intervention.

5. Conclusions

COPD is a respiratory disease, almost all the intervention is of certain significance, many indicators can reflect the outcome of the intervention. There are many interventions to improve the quality of life of COPD patients, including education and exercise, telemedicine, supervise or monitor. Nursing intervention is essential in the treatment and rehabilitation of COPD patients.

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1.

Table 3. Overview of the selected articles

Author(s)+ year/country of publication	Title	Design, Approach	Participants Number/Age/gender%	Data collection method(s) Sampling method	Data analysis method(s)	Code
Ying W, Xiao-Ying Z, Jinbing B, Su-Yan L, Yue Z and Qing Z 2013 China	Effect of a Health Belief Model-based nursing intervention on Chinese patients with moderate to severe chronic obstructive pulmonary disease: a randomised controlled trial	Randomised controlled trial (RCT) A quanitative approach	Inclusion:1) Confirmed diagnosis of AECOPD when admitted to the respiratory ward, 2) Age above 45 years, 3) With the values of pulmonary function test of FEV_1/FVC ratio<=70% and FEV_1 between 30–80%, 4) not participating in any other rehabilitation research or programmes, 5) Being conscious and able to communicate in Chinese, 6) Lliving in the Tianjin area so that subsequent follow-ups were possible Exclusion:1)Diagnosed with	1. The Health Belief Scale (HBS): 35 items, each item was scored by a 5-point Likert scale which showed good internal consistency with a Cronbach's a value of 0.87. 2. The COPD Self-Efficacy Scale (CSES): 31 items, each item was scored by a 5-point Likert scale, which used the final 30-item scale, with 10 items left in the negative affect dimension.	1.Descriptive statistics. 2.Independent sample t-test, chi-square and one-way 3.Analysis of variance 4.Mann–Whitney U-test. 5.Repeated-measures analysis of variance (rm ANOVA)	1

			other severe diseases, such as allergic rhinitis, myocardial infarction, heart failure, malignant tumour,2) Refused to sign the informed consent forms, or refused to complete the pulmonary function test. Total=92 Mean age=71.60 years (range: 52–90). Intervention group (n= 45) gender, n (%): male= 23 (54.76) female =19 (45.24) Control group (n = 47) gender, n (%): male=27 (58.70) female=19 (41.30)	3. The Modified Medical Research Council Dyspnea Scale(MMRC): a one-item scale scored from 0–4. A higher score of MMRC indicates a higher degree of difficulty in breathing. 4. The Barthel Index: the total score of this index ranges from 0–100, with a higher score suggesting a higher daily living skill which showed good reliability and validity. 5.Pulmonary function test: forced vital capacity (FVC), the forced expiratory volume in one second (FEV_1) and the		

				ratio of FEV_1 to FVC.		
				6.6MWD: a submaximal exercise test.Each participant's 6MWD was measured twice, and the longer distance was chosen for the data analysis.		

Blackstock FC, Webster KE, Mcdonald CF, Hill CJ 2013 Australia	Comparable improvements achieved in chronic obstructive pulmonary disease through pulmonary rehabilitation with and without a structured educational intervention: A randomized controlled trial	A randomized controlled trial A quanitative approach	Who had a primary diagnosis of COPD, reported dyspnoea with daily activities and were on stable medical therapy. Total: n= 267 (meanage72(9) years) ET(exercise training intervention) n=126,age=72.0 (8.4) Gender,male/female, n (%)=72 (57)/54 (43) ET + ED(exercise training and education intervention group) n=141,age= 72.4 (10.0) Gender, male/female, n (%)=89 (63)/52 (37)	1.6-min walk distance: 2.Chronic Respiratory Questionnaire: 3. Medical Research Council dyspnoea scale 4. Functional activity with the grocery shelving task 5. Assessment of Quality of Life tool 6.General Self-Efficacy Scale	1.Gaussian distribution (generalized estimated equation) 2. Gamma distribution 3. Pearson's chi-square 4.Mann–Whitney U 5.Wilcoxon Signed Rank	2

Billington J, Coster S, Murrells T, Norman I 2014 United Kingdom	Evaluation of a Nurse-Led Educational Telephone Intervention to Support Self-Management of Patients with Chronic Obstructive Pulmonary Disease: A Randomized Feasibility Study	A single-centre, two armed randomized feasibility study	Inclusion: 1) On the COPD register, based on their clinical symptoms and previous spirometry results of FEV 1 /FVC ratio of 70% orless, which was not fully reversible 2) Able to speak and read English to a level to be able to give informedconsent and complete a questionnaire Exclusion:1) Patients with a concurrent serious illness such as lung cancer to avoid overburdening them, 2)Patients living in a nursing or residential home, or whom were housebound Total number=73	1.Baseline data 2.Patients were sent the same questionnaires by post at 12 weeks after baseline and returned questionnaires All information including CAT scores and informa-tion on hospital visits and exacerbations were collected through the self-report questionnaires.	1.CONSORT 2.Paired t-tests 3.Analysis of covariance (ANCOVA) 4.Wild Bootstrap 5.Exact Conditional 6. Poison regression 7. Logistic Regression model	3

			Intervention group			
			Mean (SD), n = 35,			
			age=72.09 (9.24) male=18			
			Control Mean			
			(SD), n = 38			
			age =71.97 (11.04) male=17			

| Lee H, Yoon JY, Lim YJ, Jung HY, Kim S, Yoo Y, Kim Y, Ahn JJ, Park HK 2014 Korea | The effect of nurse-led problem-solving therapy on coping, self-efficacy and depressive symptoms for patients with chronic obstructive pulmonary disease: a randomised controlled trial | A randomised controlled trial A quanitative approach | Inclusion: 1) 40–80 years of age, 2) Diagnosed with COPD by a physician based on a pulmonary function test 3) in stable condition and expected to live ≥6 months as determined by a physician who specialized in respiratory medicine. Pulmonary function was tested based on the guidelines by the American Thoracic Society using the Vmax 22 system Exclusion: 1) Severe co-morbid conditions that interfered with walking 2) Communication difficulties due to hearing loss or illiteracy. | 1.Coping was measured using the Jalowiec Coping Scale (JCS): The items assessed tendencies that constructively deal with stressors using a 5-point scale ranging from 1 to 5. The Cronbach's a of the JCS was 0.88.Subscale of problem-oriented coping (15 items) in this study 2.Self-efficacy was measured using the COPD Self-Efficacy Scale (CSES): The CSES consists of 34 items with a 5-point scale, used the mean score of these 34 items ranging | 1. Regression analysis 2. Paired t-test 3. Levene's test | 4 |

			Total (n=151) n (%) or mean (SD)	from 0 to 5.		
			Age=66.1 (8.2)	The Cronbach's a of the CSES was 0.96.		
			Intervention (n= 78) n (%) or mean (SD)age=66.7 (7.9)	3.Depressive symptoms were measured with the		
			Comparison (n=73)n (%) or mean (SD)age= 65.4 (8.6)	CES-D developed by Radloff: Consists of 20		
			Most participants were male (91.4%) and married (84.8%)	items with a 4-point scale ranging from 0 to 3.		
				The total scores for depressive symptoms		
				ranged from 0 to 60.		
				The reliability of CES-D was 0.86.		

Zwerink M, Kerstjens HA, Palen J. Vd, Valk P. Vd, Brusse-keizer M, Zielhuis G, Effing T 2015 Netherlands	(Cost-)effectiveness of self-treatment of exacerbations in patients with COPD: 2 years follow-up of a RCT	A randomised controlled trial A quanitative approach	Inclusion : 1) A clinical diagnosis of COPD according to the GOLD criteria; 2) No exacerbation in the month before enrolment; 3) >3 exacerbations, defined as respiratory problems that required a course of oral corticosteroids and/or antibiotics or >1 hospitalisation for respiratory problems in the 2 years preceding study entry; 4) (ex) smoker; 5) Age 40–75 years; 6) Post-bronchodilator forced expiratory volume in 1 s (FEV$_1$) 25–80% predicted; 7) Able to understand and	1.Severity and duration of exacerbations: Severity of symptoms on any exacerbation day was calculated by a cumulative score ranging from 0–11 points; the daily score was 15 points when patients were hospitalized. 2. HRQoL was assessed by Questionnaire (CRQ) and the Clinical COPD Questionnaire (CCQ) Anxiety and depression: Hospital Anxiety and Depression Scale (HADS): Patients were assessed at baseline, 7, 12, 18 and 24 months.	1. Negative binomial regression analysis 2. Student's t-test or Wilcoxon's rank-sum test 3. Mixed models procedure 4. Cost-effectiveness: decision analytic model with a time perspective of 24 months	5

			read Dutch	Information about health-		
			8) written informed consent from the subject prior to participation	care utilization was collected from medical registrations.		
			Exclusion:			
			They had comorbidities with a low survival rate, or influencing lung function or bronchial symptoms.			
			Self-management group(n=70)age=63.1(7.9) Male (%) =57.1 Control group(n=72)age=63.7(8) Male (%) =61.1			

Sánchez-Nieto JM, Andújar-Espinos R, Bernabeu-Mora R, Hu C, Gálvez-Martínez B, Carrillo-Alcaraz A, Álvarez-Miranda CF, Meca-Birlanga O, Abad-Corpa E 2016 Spain	Efficacy of a self management plan in exacerbations for patients with advanced COPD	Controlled, randomized, parallel-group, single-blind study with follow-up of 1 year A quanitative approach	Inclusion: 1)Clinical stability (at least in the 3 months prior to randomization, with no change in medication or usual symptoms); 2) Active smoker or prior history of smoking of at least 10 pack-years; 3)Post-bronchodilator forced expiratory volume in 1 second/forced vital capacity ratio ,70%; 4) Normal cognitive status(assessed by the intersecting pentagons test 18) to read and understand written texts, and receive training in inhalation techniques or self-care	modified Medical Research Council dyspnea scale; quality of life (COPD assessment test) and a social-risk questionnaire hospital admissions and A&E visits for COPD during the 12-month follow-up period	1. intention-to-treat principle 2. Pearson's chi-squared test or Fisher's exact test 3. Student's t-test or the Mann–Whitney U-test 4. McNemar's test 5. Kaplan–Meier curves with the log-rank test 6. two-tailed test	6

			education sessions; 5) Physical status that allows for regular walking or exercise; 6) No diagnoses of asthma, advanced heart failure, unstable ischemic heart disease, terminal disease, dementia, or uncontrolled psychiatric disorders; 7) Ability to read texts; 8) No participation in any pulmonary rehabilitation program in the previous year Total: 96 patients Male % (n)= 91.76(78) Female % (n)=8.24(7). Mean age: CG =67.6±6.9 years; and IG =68.4±7.3 years			

Johnson - Warrington V, Rees K, Gelder C, Morgan MD, Singh SJ 2016 UK	Can a supported self-management program for COPD upon hospital discharge reduce readmissions ? a randomized controlled trial	A prospective, two-center, single-blinded randomized controlled trial A quanitative approach	Inclusion: They had an established diagnosis of COPD and grade 2–5 dyspnea according to the Medical Research Council Exclusion: reason for admission was not an acute exacerbation of COPD or if they were 1) Unable to safely participate in unsupervised exercise (ie, due to psychiatric,2) Involved in other research, 3) Unable to read English, 4)Had previously received SPACE for COPD or completed PR within the previous 6 months, or 5)Had four or more admissions in the previous 12 months.	1.Chronic Respiratory Questionnaire – self reported (CRQ-SR), Hospital Anxiety and Depression Score, Bristol COPD Knowledge Questionnaire, Incremental Shuttle Walk Test (ISWT), Endurance Shuttle Walking Test (ESWT), Pulmonary Rehabilitation Adapted Index of Self-Efficacy, the "Ready for Home" survey	1. Fisher's exact test 2. Odds ratios 3. Independent t-tests or Kruskal–Wallis tests 4. Paired t-tests or Wilcoxon signed rank Tests	7

			Randomized: 78			
			Usual care(n=39)			
			SPACE(n=39)			
			Gender: Male			
			%(n)=35.90(28)			
			Female % (n)=64.10(50)			
			Age: Usual care=68.33(7.73)			
			SPACE=67.64(8.54)			
			3-months analysis			
			Usual group(n=36)			
			SPACE(n=35)			

| Vatnøy TK, Thygesen E, Dale B

2016

Norway | Telemedicine to support coping resources in home-living patients diagnosed with chronic obstructive pulmonary disease: Patients' experiences | individual semi-structured interviews

A qualitative approach | Participants were recruited sequentially, as all patients who met the inclusion criteria were asked before discharge if they were willing to participate in an interview after they had returned home, n= 10
Male % (n)= 70(7)
Female % (n)= 30(3)
Age: 55-83 | Convenience sampling method
Qualitative interviews, including a semi-structured interview guide
The data were transcribed verbatim | The qualitative content analysis method described by Graneheim and Lundman was used. | 8 |
|---|---|---|---|---|---|---|

Nissen L, Lindhardt T 2017 Denmark	A qualitative study of COPD-patients' experience of a telemedicine intervention	A qualitative Research Descriptive phenomeno-lo-gical approach.	Inclusion: Stable ones from the outpatient clinic with severe and very severe COPD and at high risk of exacerbation from RCT Exclusion: patient with an episode of exacerbation requiring a change in medication three weeks prior to enrolment total=14, Male% (n)= Female % (n)= 57(8) Age (Mean age (range)): 69.5 (55–83)	The 12 participants who still had the telemedicine equipment were interviewed via a video link on their tablets The remaining 2 were interviewed in their own homes as they had ceased receiving telemedicine The interviews lasted an average of 38 min (range: 22–65 min). The interviews were recorded on tape and subsequently transcribed verbatim.	Manifest and latent Content analysis	9

Barken TL, Thygesen E, Söderhamn U, 2017 Norway	Unlocking the limitations: living with chronic obstructive pulmonary disease and receiving care through telemedicine – a phenomenological study	Descriptive design and the method is qualitative based on semi structured interviews Phenomeno lo-gical approach. Qualitative	Inclusion: Patients had been followed up between one and three months during the TM intervention and had returned the TM equipment to the local hospital. Total=10 Male % (n)= 70(7) Female % (n)= 30(3) Age : 61-80 years(mean of 72 years)	Data were collected by in-depth interviews over an eight-month period in 2015 from January to August The interviews were audiotaped and transcribed verbatim and lasted from 30 to 50 minutes, with an average of 38 minutes	A descriptive phenomenological research method following four steps (Giorgi 2009)	10

Laue J, Melbye H, Risør MB	Self-treatment of acute exacerbations of chronic obstructive pulmonary disease requires more than symptom recognition – a qualitative study of COPD patients' perspectives on self-treatment	A qualitative research	Inclusion: participants via the responsible physician at a heart-and-lung rehabilitation institution	Interviewed 19 patients with COPD using qualitative semi-structured interviews	Thematic analysis and an inductive approach,	11
2017 Norway		qualitative semi-structured interviews	The first round=74 The second round=48 who had taken part at least once in a 4-week 19 joined in first step analysis Age range: 55-79 Gender: male % (n)= 63.16 (12) Female % (n)= 36.84(7)	The interviews lasted between 60 and 120 min. All were conducted by the first author (a general practitioner trainee and PhD fellow), supervised by the last author between interviews, and followed an interview guide with the same key-questions in all interviews	Mindjet MindManager Professional, Themes were constantly tested by moving between the data, codes and visual theme maps to ensure that they represented the meanings found in the data and their explanatory power	

| Apps LD, Mitchell KE, Harrison SM, Sewell L, Williams JE, Young H. ML, Steiner M, Morgan M, Singh SJ

2013
UnitedKingdom | The development and pilot testing of the Self-management Programme of Activity, Coping and Education for Chronic Obstructive Pulmonary Disease (SPACE for COPD) | A mixed method research

Conduct five focus groups, polit, then interview | Five FGs were held, facilitated by two researchers with experience in qualitative methods
Focus groups: n=24
Mean age:67.83-73.80
Gender: male % (n)=62.5(15)
Female % (n)= 37.5(9)

Polit test participant=37
Inclusion:
1) Diagnosis of COPD confirmed by spirometry with a forced expiratory volume in 1 second (FEV 1)/forced vital capacity (FVC) ratio of ,70%
2) Score of 2–5 on the Medical Research Council Dyspnoea Scale 3) Not significantly affected by | Convenience sample
Quantitative: Self-Reported Chronic Respiratory Disease Questionnaire(CRQ-SR),Incremental Shuttle Walk Test (ISWT), Endurance Shuttle Walk Test (ESWT), and Hospital Anxiety and Depression Scale (HADS), paired t-test
Qualitative: interview participants were asked to comment on what information was needed to self-manage their COPD, their preferred level of support from health care professionals | Quantitative: Paired t-test the mean difference and 95% confidence interval (CI) between baseline and 6 weeks were calculated for all outcome measures
Qualitative: Thematically | 12 |

neurological, locomotive, or cognitive problems that would compromise the outcome measures 4) Had not undertaken PR in the previous 12 months. Exclusion: no patients had participated in education aside from PR. Mean age=68.05 Male % (n)= 59.46(22) Female % (n)=40.54(15) Follw up participants=20	and how SPACE for COPD could be facilitated. Toward the end of the discussion, draft content for the SPACE for COPD manual was presented and action plans discussed, written informed consent was obtained from participants and all FGs were digitally recorded and transcribed verbatim.			

Table 4. The aims and the results of the selected articles.

Authors	Aim	Results	Code
Wang Y, Zang XY, Bai JB, Liu SY, Zhao Y, Zhang Q 2013 China	The purpose of this study was to examine the effect of a HBM-based nursing intervention on healthcare outcomes in patients with moderate to severe COPD.	The patients' health belief and self-efficacy score increased significantly after HBM based nursing intervention. After 3 months follow-up, the average total scores of the intervention group on the health belief scale, COPD self-efficacy scale and all sub-scales were significantly higher than those of the control group, except for the perception of disease severity. The results showed that there was a significant difference in FEV1/FVC ratio between groups before and after intervention. In addition, there were significant differences in the mean scores of dyspnea scale, 6-minute walking distance and ADL between the two groups and between the study time points.	1
Blackstock FC, Webster KE, Mcdonald CF and Hill CJ 2013 Australia	This study describes the evaluation of benefit of disease-specific group education incorporating principles of self-management within a pulmonary	The results showed no significant difference, indicating any improvement in health outcomes coupled with education. The two intervention groups had similar significant improvement immediately after the intervention and remained the same for the next 12 months.	2

	rehabilitation programme for patients with COPD, to determine whether the addition of education to exercise training resulted in greater improvements in health outcomes than pulmonary rehabilitation where education has been omitted.		
Billington J, Coster S, Murrells T, and Norman I	The aim of this study was to examine whether a telephone support intervention designed to promote	Of the 73 randomised patients, 69 were followed up for CAT data. The CAT score of intervention group decreased significantly at 1-2 (time 1 = 15.56vs time 2:12.44, mean difference: 3.12, CI 1.52-4.72, $P < 0.05$), and there was no significant change in control group. There was a significant difference between intervention group and control group in baseline CAT score of adjustment time 1 (2.38 (4.40-0.36) $P < 0.05$). As time went on, there was no significant difference between satisfaction and intervention group.	3

2014 UK	the use of their action plan for self-management increased patient well-being and reduced symptom severity in a UK primary care setting.		
Lee H, Yoon JY, Lim Y, Jung H, Kim S, Yoo Y, Kim Y, Ahn J-J, Park H-K 2014 Korea	To examine the effects of nurse-led, problem-solving therapy (PST) on coping, self-efficacy and depressive symptoms for patients with chronic obstructive pulmonary disease (COPD) using a randomised	There was no significant difference between the two groups in problem oriented coping, self-efficacy and depressive symptoms. However, despite the lack of inter-group differences, nurse-led PST was effective for COPD patients with clinical depression, with reduced depressive symptoms and increased self-efficacy in the intervention group (mean difference = 6.8, P = 0.009) (mean difference = 0.6, P = 0.041). N = 12).	4

	controlled trial.		
Zwerink M, Kerstjens HA, van der Palnen J, van der Vallk P, Brusse-Keizer M, Zielhuis G and Effing T 2015 Netherlands	The aim is to evaluate the (cost-)effectiveness of selftreatment of exacerbations, guided by an action plan, within a self-management programme to a selfmanagement programme only in patients with COPD after 2 years of follow-up.	The clinical data of 70 patients with chronic obstructive pulmonary disease (STG) and 72 controls (CG) were analyzed. Over two years, the median number of deteriorating days in STG (50, IQR: 32-115) was significantly lower than that in CG (82, IQR: 22-186) (P = 0.047), and the mean symptom score (STG: 43.4, IQR 27.2-68.6 vs CG: 55.9, IQR: 31.2-96.8) (P = 0.029). In addition, STG patients visited less frequently than CG patients, the incidence of 1.52 (95% CI: 1.28-1.79) and 2.27 (95% CI: 1.11-4.62) respectively. Direct medical costs over 2 years have been reduced by 1078 euros in STG.	5
Sáncheznieto JM, Andújar-Espinosa R, Bernabeu-Mora R, Hu	This study evaluates the efficacy of a self-management intervention added to usual care in a	After one year of intervention, the COPD deterioration rate decreased from 1.37 to 0.89 (P = 0.04) and the number of deterioration decreased from 52 to 42. Due to the exacerbation of COPD, 19 (40.4%) and 20 (52.6%) were hospitalized, and 9 (19.1%) and 14 (36.8%) patients (P = 0.06) had lower numbers of visits to A&E in this group. The antibiotic intake of the intervention group was significantly higher than that of the control group, while the	6

C, Gálvez-Martínez B, Carrillo-Alcaraz A, ÁlvarezMiranda CF, Meca-Birlanga O, Abad-Corpa E 2016 Spain	randomized, controlled study. Our hypothesis is that a multiple component intervention called a COPD self-management program (SMP-COPD), led by a multidisciplinary team, could significantly reduce the use of health care resources and, in particular, the number of exacerbations requiring hospital care.	glucocorticoid use was slightly lower than that of the control group, but there was no significant difference (P = 0.30). There was no difference between the groups in terms of length of stay (P = 0.154) or total mortality (P = 0.191).	

Johnson-Warrington V, Rees K, Gelder C, Morgan MD, Singh SJ 2016 UK	To investigate if SPACE for COPD employed upon hospital discharge would reduce readmission rates at 3 months, compared with usual care.	Seventy-eight enrolled patients (n = 39) had no difference in readmission or mortality rates between the three-month group. Ten patients in the control group were re hospitalized within 30 days, while five patients in the intervention group (P0.05). The results of exercise tolerance and chronic respiratory questionnaire (CRQ-SR) were significantly improved in both groups. The differences of CRQ-dyspnea and CRQ-mood between the two groups were close to statistical significance, which was conducive to intervention. Prepare to Go Home Survey showed that the patients who received the intervention reported feeling better able to manage their lives to cope with COPD, knowing when to seek help to relieve discomfort, and taking prescribed medications more often than regular care (P, 0.05).	7
Vatnøy TK, Thygesen E and Dale B 2016 Norway	This study investigated how the patients experienced follow-up using a TM intervention, and the extent to which it supported and improved coping resources and independence.	The theme derives from participants' positive attitudes toward handling and understanding technology, as well as from their positive and negative emotions related to the use of technology: "Telemedicine solutions are experiencing comprehensibility and manageability and provide meaning in everyday life." The importance of providing trusted and confident telemedicine services, the impact of interventions on independence and self-management, and the ability to intervene to support integrity and meaning of life spawned the theme: "Telemedicine interventions help reduce stress. Life is as normal as possible due to disease burden.	8
Nissen L, T	The aim of this	Participants reported that Net-COPD brings increased well-being and security, knowing that	9

Lindhardt 2017 Denmark	study was to illuminate stable COPD patients' experience of participating in a 6 month telemedicine intervention substituting visits to the outpatient clinic.	nurses are watching them closely and initiating appropriate interventions in patients with changing conditions. This is the lifeblood of the respiratory clinic, and can be contacted when necessary. In addition, through monitoring, patients' awareness and self-management of diseases have been improved. Compared with Department of respiration outpatient service, patients also experienced more focused and less stressful meetings through video consultation. Nonetheless it was important that it was the same health staff patient met in the video consultations.	
Barken TL, Thygesen E, U Söderhamn 2017 Norway	The aim of this study was to describe the lived experiences of quality of life among a group of patients living with COPD who were included in a telemedical intervention after	COPD patients' life experience is the result of physical and mental limitations, as well as the increased identity of patients, leading to a decline in the quality of life. The inclusion of TM intervention increased accessibility of health care services and TM nurses' support. Self-measurement of health data increased participants' clinical insight and created a common clinical language in their conversations with TM nurses, thereby improving the quality of life. However, receiving nursing through TM has also undergone double housework.	10

	hospitalization for disease exacerbation.		
Laue J, Melbye H and Risør MB 2017 Norway	This study aims to get insight into the patients' perspective on self-treatment of acute exacerbations of COPD, focusing specifically on how patients decide for the right moment to start treatment with antibiotics and/or oral corticosteroids, what they consider important when making this decision and aspects which might interfere with	Patients have good experience in understanding and timely coping with worsening symptoms of COPD. Concerns about the potential adverse effects of antibiotics and oral glucocorticoids play an important role in deciding to start treatment and may lead to hesitation to start treatment. Although self-treatment represents a practical and appreciative model and predictable choice of symptomatic treatment for some patients, all patients favor assistance from the medical profession when their perception reaches its limits. However, a sense of responsibility with self-treatment or distrust of the success of their doctor or health care system can prompt patients to seek help.	11

	successful implementation.		
Apps LD, Mitchell KE, Harrison SL, Sewell L, Williams JE, Young HM, Steiner M, Morgan M, Singh SJ 2013 UK	This paper describes the development and preliminary testing of a self-management manual (the Self-management Programme of Activity, Coping and Education for Chronic Obstructive Pulmonary Disease [SPACE for COPD] manual, or SPACE manual) designed to be introduced to patients through the vehicle of a	The pilot study observed significant improvements in self-reported chronic respiratory questionnaire and ESWT dyspnea. The mean change of dyspnea was 0.67 (95% CI 0.23 to 1.11, P = 0.005). The ESWT score increased by 302.25 seconds (95% CI 161.47 to 443.03, P, 0.001).	12

	motivational interview.		