SLOBOZHANSKYI HERALD OF SCIENCE AND SPORT

UDK 615.825:612.746:[612.2]

ISSN (English ed. Online) 2311-6374
2019, Vol. 7 No. 5(73), pp. 52-58
DOI: 10.5281/zenodo. 3675383

Self-management strategy in training programs for patients with chronic obstructive pulmonary disease

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The aim of modern therapy for chronic obstructive pulmonary disease (COPD) is to reduce the severity of symptoms and prevent the development of relapse exacerbations, maintain pulmonary function at an optimal level and improve the quality of life of patients. The solution to these problems is pulmonary rehabilitation. Search for effective ways of providing an educational component, assessing the impact of various training programs and implementing a self-management strategy continues.

Purpose: *to analyze modern approaches, advantages and disadvantages of educational programs on self-management of people with COPD and establish the role of a physical therapy specialist in providing them.*

Material & Methods: *the search was conducted on the resource of the US National Center for Biotechnological Information PubMed and in the database of scientific evidence on physical therapy PEDro. According to the results of the search in the databases, 329 links were obtained, of which, after excluding those that did NOT meet the necessary criteria, 14 publications were selected for subsequent analysis.*

Results: *29 educational topics related to self-management education were identified, which in different combinations are recommended for study in educational programs for patients with COPD. Training topics were grouped into four training modules that took into account the goals and objectives of the self-management strategy and ensure their solution. The most often competent in implementing educational programs for patients with COPD are a pulmonologist, physical therapist, nurse, pharmacist, occupational therapist, and social worker. The content, results, advantages and limitations of various self-management training programs are analyzed.*

Conclusions: *today there are not enough practical recommendations and clear criteria that training programs on self-management for patients with COPD should meet. The analysis of modern clinical studies on the introduction of self-management training is the basis for the development of Ukrainian-language training programs.*

Keywords: *physical therapist, physical therapy, pulmonary rehabilitation, education, COPD, self-control.*

Introduction

It is important for the patient to understand the characteristics of his disease, the available options for its treatment and control. In the case of a chronic disease requiring constant treatment and rehabilitation, significant efforts, and constant measures to prevent deterioration, such knowledge is vital. The implementation of an integrated approach to pulmonary rehabilitation of patients with chronic obstructive pulmonary disease (COPD) provides for the implementation of the educational component; it is within its framework that the patient is helped to form and develop skills that are the basis for effective self-management [36].

The first publication, which was published in 1986, was close to self-management issues and focused on self-monitoring and stress management in patients with chronic diseases, in particular, with COPD [1]. Today, the attention of scientists and specialists in pulmonary rehabilitation is much more often focused on the problems of self-management of patients, assessment of its advantages and effectiveness, in particular, in combination with other components of pulmonary rehabilitation programs.

Intervention for the implementation of self-management for people with COPD has a certain structure, is personalized, and often multi-component. They aim to motivate, attract and support patients in the process of adapting behavior and developing skills to manage the disease better [14].

The self-management concept contains self-control, management of symptoms, emotional, psychosocial, and functional consequences of the disease, provides for cooperation with family, society, and medical workers [32].

The self-management strategy, which has separated from the educational component, is more comprehensive today, covers a wide range of tasks, aims to increase the level of self-efficacy and disease control, relying on a high level of patient knowledge, well-formed skills, well-established cooperation with health professionals [35].

Approaches aimed at developing self-management are primarily based on providing patients with the necessary information, as well as formulating an individual goal and strategy, focusing on supporting motivation, achievements and a high level of mental health [8].

In Ukraine, the education of patients with COPD and informing them about the disease, changing the way necessary daily actions are undoubtedly present in the process of treatment and rehabilitation. However, such enlightenment is not sys-

temic; there is no didactic and methodological support. Usually, the recommendations of leading professional societies and clinical guidelines are not taken into account; they do not attract specialists of various specialties in a team and interconnected work. However, thoughtless copying of the world's leading approaches for the rehabilitation and education of patients with COPD in Ukraine is not possible and appropriate. It should take into account the peculiarities of the Ukrainian health care system, material and technical and staffing, the willingness of patients to spend additional resources on the measures provided during treatment and rehabilitation. An essential step in introducing the educational component of pulmonary rehabilitation and self-management, in particular, with the involvement of physical therapy specialists, is the analysis of modern approaches, advantages and disadvantages of existing educational programs.

Purpose of the study was to analyze modern approaches, advantages and disadvantages of educational programs on self-management of people with COPD and establish the role of a physical therapy specialist in providing them.

Material and Methods of the research

The search was conducted on the resource of the National Center for Biotechnology Information of the USA PubMed and in the database of scientific evidence on physical therapy PEDro. The database was searched for a number of keywords (for PubMed – "COPD", "Chronic Obstructive Pulmonary Disease," "Physical Therapy," "Physical Therapy," "Physiotherapy," "Self-management," "Self management," for PEDro – "Chronic Obstructive Pulmonary Disease," "Self-management") using the Boolean logical operators "AND" and "OR".

The inclusion criteria for the analysis were as follows:

1) publication addresses self-management issues in individuals with COPD;
2) scientific work concerns the meaning, ways of implementing the self-management strategy, its effectiveness and content as a separate activity, or part of pulmonary rehabilitation programs or physical therapy
3)published during June 2014 – June 2019.

The following exclusion criteria were used:

1) do not match the selected search period June 2014 – June 2019;
2) protocols of incomplete clinical trials, pilot studies, methodological substantiation of future clinical studies;
3) publications regarding other diseases of the respiratory system, or if the patient simultaneously had COPD and another disease / other diseases;
4) studies are devoted to the use of self-management in pharmacotherapy or to control the emotional state;
5) there is no access to a full-text article;
6) language of publication is not English.

Search conducted in June 2019.

Based on the search results, 329 links were received in the databases (Fig. 1), in particular, 232 from the PubMed database and 97 from the PEDro database. At the screening stage, duplication of links (n=19) was detected and articles meeting the exclusion criteria (n=249) was removed. At the stage of analysis and selection of full-text articles, 47 publications were additionally withdrawn that met the exclusion criteria. Subsequently, the work analyzed the content of 14 publications that met all the search requirements.

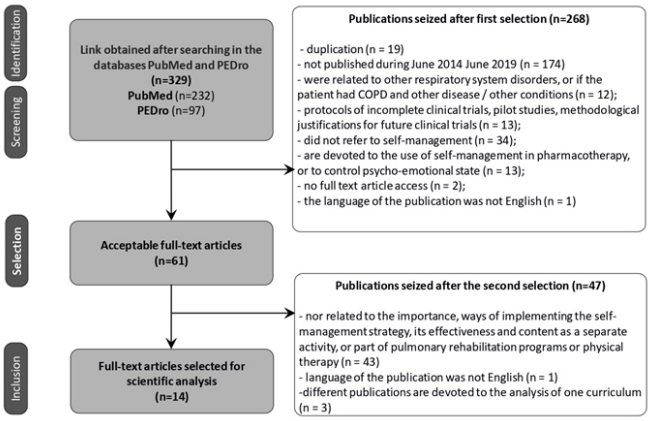

Fig. 1. PRISMA flowchart for selecting publications for analysis

Results of the research

According to the analysis of 14 scientific works, 29 educational topics were identified related to education on self-management issues and in different combinations are recommended for study in training programs (Table 1).

The training modules that take into account the goals and objectives of the self-management strategy and provide their solutions are:

– management of symptoms;
– self-control;
– management of the consequences of the disease (emotional, psychosocial, functional);
– cooperation with family, society, and healthcare professionals.

To implement the proposed training topics attract specialists of various specialties. In particular, the most often competent in the implementation of educational programs for patients with COPD are a pulmonologist, physical therapist, nurse, pharmacist, occupational therapist, and social worker. Educational topics, to the presentation of which it was recommended to involve physical therapists, are also indicated in the Table 1.

Despite the similarities between the components of patient education and self-management education, they have a number of important differences [7], namely, self-management education is based on the patient's commitment to the proposed curriculum and its active participation; problems, goals and objectives are formulated by the patient, not a health professional; the information provided and the formation of skills is problem-oriented rather than nosological in nature; behavioral changes occur due to the patient's confidence in the opportunity to participate in self-management, and not only due to an increase in the level of knowledge. In general, self-management education aims to encourage the patient to control the disease and its consequences [20]. The component "patient education" in pulmonary rehabilitation programs is not effective enough since it does not change the patient's behavior to a sufficient extent and does not allow the forma-

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Table 1

Content of educational programs on self-management

Module	Topics	Scientific work													
		1	2	3	4	5	6	7	8	9	10	11	12	13	14
Symptom management	Diseases of the lungs and treatment of COPD	+	+	+	+P	+P	NS	+	+	–	–	NS	–	+	+
	Medicines	+	+	+	+	+P	+	–	+	+	+	+	–	+	–
	Oxygen therapy	+	+	–	–	–	NS	–	NS	–	–	–	–	–	–
	Disease control (in particular, symptoms and exacerbations)	+	+	±	+P	+P	+	+	+	–	+	+	–	+	+
	Shortness of breath control	+P	+	±	+P	+P	+	+	+	+	+	+	–	+	+
	Airway cleansing	+P	+	+	± P	NS	NS	NS	+	+	–	+	–	NS	+
Self-control	Respiratory Function Tests	+	+	–	–	–	NS	–	–	+	+	–	–	–	–
	Economical use of own forces	+	+	–	–	–	NS	+	+	–	–	+	–	–	–
	Nutrition	+	+	+	+	+P	NS	+	+	–	–	–	–	–	–
	Defining your own goal, tasks, action plan	–	+	–	+	–	NS	–	+	–	+	+	+	–	–
	Lifestyle (habits)	–	–	–	–	+P	+	+	+	–	+	+	+	–	+
	Practical skills for using inhalers	–	–	–	–	–	–	–	–	+	+	–	–	–	–
	Limitations and COPD	+P	+	±	–	–	–	–	–	–	–	–	+	NS	+
	Travels	–	+	–	–	–	–	–	–	–	–	–	–	–	–
	Free time and hobbies	–	+	–	–	+P	–	–	–	–	–	+	–	–	–
	Determination of walking speed	–	+	–	–	–	–	–	–	–	–	–	–	–	–
Management of the consequences of the disease (emotional, psychosocial, functional)	Exercise and activity	+P	+	+	+P	+P	+	+	+	+	+	+	+	+	+
	Stress and anxiety	+	+	–	+	+P	+	+	+	–	–	+	–	+	+
	Cognitive function management	–	–	–	+	–	NS	–	–	–	–	–	–	–	–
	Sleep	–	–	–	–	+P	–	NS	–	–	–	–	–	–	–
	Relaxation	–	–	–	–	–	–	–	–	–	–	–	–	–	+
	Swallowing and COPD	+	–	–	–	–	–	–	–	–	–	–	–	–	–
	Swallowing screening	+	–	–	–	–	–	–	–	–	–	–	–	–	–
Family life, cooperation with society, healthcare professionals	Resources provided by society	+	–	–	+	–	+	–	–	–	–	–	–	–	–
	Help for guardians	–	+	–	–	–	–	–	–	–	–	–	–	–	–
	Relations	–	+	–	–	–	–	–	–	–	–	–	–	–	–
	Sexuality and intimacy	+	+	–	–	+P	NS	–	–	–	–	–	–	–	–
	Communication	–	–	–	+	–	NS	–	–	–	–	–	–	–	–
	Influence of partner, family, friends and colleagues on behavior	–	–	–	–	–	–	–	–	–	–	–	+	+	–

Remark: *1 – Blackstock, F. C. [4]; 2 – Chaplin, E. [1; 11]; 3 – Blбnquez Moreno, C. et al. [5]; 4 – Cameron-Tucker, H. L. [9]; 5 – Carron, T. [10]; 6 – Chen, K. H. et al. [12]; 7 – Lopez-Lopez, L. et al. [23]; 8 – Nyberg, A. et al. [30]; 9 – Bhattacharyya, P. et al. [3]; 10 – Jolly, K. et al. [18]; 11 – Marquis, N. et al. [25]; 12 – Voncken-Brewster, V. [37]; 13 – Jonsdottir, H. [19]; 14 – Howard, C. [16]; P – training topics that are supposed to be conducted by a physical therapist, NS – not specified; ± – topic partially disclosed.*

tion of the necessary self-help skills at a high level [31]. According to Sohanpal, R. et al. [34], patient education should be considered as part of the self-management education component.

Self-management education is aimed at solving two main tasks: 1) adjust patient behavior to further support health; 2) teach patients how to influence and manage diseases.

Changing the patient's behavior to maintain his health involves increasing the level of physical activity, performing physical exercises, quitting smoking, and is also aimed at increasing the patient's adherence to drug treatment, mastering the correct inhalation technique.

The impact and management of diseases includes the following:

– avoidance of factors worsening the patient's condition (smoking, dust);
– management of dyspnea (taking medication, mastering the breathing technique through compressed lips);

– the use of methods of economical use of own forces (for example, the choice of pace of walking);
– concluding an exacerbation management strategy (an action plan containing key components to facilitate exacerbation management);
– use of stress management techniques (exercises for relaxation).

Self-management education for people with COPD aims to master these skill groups [13]:
– prevention, control and management of the consequences of COPD and respiratory symptoms;
– control and management of daily activity;
– overcoming sleep problems;
– control of exacerbations and their management;
– management of mental state and overcoming emotional discomfort;
– management of social spheres of life;
– collaboration with healthcare institutions;
– self-care.

The most common options for implementing a self-management program for patients with COPD are face-to-face sessions, web resources, and printed materials.

Kruijssen, V. et al. [22] recommends using an online diary to effectively implement self-management education, mastering self-control skills, and establishing feedback with health professionals. Patients with COPD who used such an instrument felt more confident, noted that they better control the disease itself; obstacles to the introduction of this technique into regular practice is the low level of patient commitment and poor Internet skills in this particular category of patients. The proposed approaches may have a number of obstacles when implemented in Ukraine – it can be difficult to implement due to the age-related characteristics of patients with COPD, their level of Internet literacy, inability to use mobile and web applications, problems with access to the Internet. Also, a limited number of Ukrainian-language Internet resources dedicated to supporting people with COPD, primarily aimed at the patient, should be considered a problem for the Ukrainian patient. This limits the use of some training material options.

Conclusions / Discussion

Self-management education provides a number of benefits for people with COPD – it improves the functional level and overall health status [27], helps reduce hospitalization, helps build and further develop skills that help control diseases [29].

According to patients with COPD, self-management is a complex and variable process, the main components of which should be self-regulation and the choice of appropriate health-saving behavior [12]. It is affected by the duration of the disease and the experience of the disease, mental state, and social support. Accordingly, training programs on self-management should be developed taking into account the characteristics, experience, and condition of the patient. Interviewing patients revealed four main, significant topics in which patients were interested: relationships with medical workers, patient awareness, support and access to the healthcare system [2].

To date, there is no single assessment of the effectiveness of educational programs on self-management. So, the evaluation of such programs revealed their positive impact on such areas of self-management as “Constructive attitudes and approaches,” “Acquisition of skills and techniques,” “Self-control and understanding”) [8], and the improvement of the quality of life [17; 28], an increase in the level of knowledge about diseases [26], a decrease in hospitalization, and the frequency of visits to a doctor [33; 38], an increase in time to the first exacerbation [17]. In a cohort study, Khan, A. et al. [21] patients who had developed a self-management plan were more likely to attend a training course or consult on physical activity, had a higher level of knowledge of COPD, and better adherence to treatment. However, in Harrison, S. L. [15], self-management training programs did not affect the quality of life, physical performance, or psycho-emotional state. Blackstock, F. C. [4] proposed an 8-week program that included sixteen classes lasting 45 minutes and consisted of physical exercises and training modules on self-management issues; this program was not more effective for improving the quality of life and the results of the 6-minute walk test compared to a program consisting solely of exercise. Participants who attended additional training sessions had a higher level of knowledge about the disease than patients who only performed physical exercises, but did not observe a statistically significant decrease in the number of visits to a doctor or medication. This study revealed certain limitations associated with the organization of a multidisciplinary approach to the implementation of the experimental program, in particular, the low patient commitment to the program – only 60% of the participants took part in it and attended 70% of the planned classes. The self-management strategy and the corresponding educational component can be implemented, implemented and supervised by various specialists, within their competence, they are responsible for their part of the curriculum and further patient support. In the case of the Blackstock program [4], the need to attract specialists from ten specialties can be attributed to the shortcomings of the program. Similar results were obtained when studying the impact of the educational web application on self-management, the main goals of the program remained unattained – increasing physical activity and quitting smoking/ limiting the number of cigarettes smoked [37].

Blбnquez Moreno, C. et al. [5] proposed a short and smaller curriculum. This allowed an increase in the number of patients completing their studies (78,2%). It was possible to reduce the duration of the educational program by reducing the training topics that were discussed in the classroom. In addition, a nurse was involved in the training. Such decisions contributed to a statistically significant improvement in the quality of life, the results of a 6-minute walk test, and a decrease in shortness of breath. Thus, if there are restrictions on staffing, it is difficult for the patient to attend more classes or sessions of long duration, it is advisable to use just such a variant of the curriculum, even though the minimum number of program sessions does not comply with the recommendations of the British Thoracic Society [6].

It is the search for the optimal curriculum that is the reason for the testing of programs of various durations, volumes, number of sessions, and semantic content. One of the options for implementing the program was to conduct training in the camps, which consisted of four intensive days with a 6-week break. Such an approach, which had proven effectiveness, made it possible to organize a full-fledged assessment at each

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meeting, to repeat what was learned, to absorb the necessary material deeper [3]. Another option for the implementation of self-management training programs was specially organized telephone conversations that were previously agreed with the patient [18]. Despite the fact that this approach did not improve the quality of life and physical performance of the patient compared to traditional pulmonary rehabilitation programs, positive changes in behavior were noted. For example, the number of patients who had life-saving first-aid kits increased, the number of requests to doctors increased to check the technique of using the inhaler and to agree on an action plan for exacerbation.

The use of printed materials is sufficient. Howard, C. used a brochure that consisted of six sections. This approach demonstrated clinical and economic efficiency, and was acceptable for participants; it can be applied both at the primary and secondary levels of treatment [16]. Also, printed materials remain the most accessible for use in Ukraine, where older adults have limited access to modern Internet and computer technologies and a low level of knowledge to use them.

Today, programs on online platforms are considered as an addition to the main curriculum or an alternative to it. Chaplin, E. et al. [11] showed high patient adherence to the SPACE for COPD web-based training program but did not find significant differences in the results of physical performance and quality of life compared with the classical pulmonary rehabilitation program and the educational component. Similar results were had by the self-management training program hosted on a web platform [30]. The adherence of people with COPD to this program and the attendance of the developed site was 77% of the patients in the experimental group; this result is comparable to the level of patient commitment to type training.

Most self-management training programs are part of pulmonary rehabilitation, which is recommended to begin within the first month after hospitalization. However, according to some data [23], the inclusion of self-management sessions for patients with COPD hospitalized due to an exacerbation has a positive effect on the quality of life and functionality, in particular, the effectiveness of the exposure is better compared to physical therapy alone.

The study and practical development of self-management as part of the educational component of pulmonary rehabilitation programs is vital for managing the disease and reducing its impact on life, and, accordingly, improving the quality of life of patients with COPD.

Search for optimal options for the implementation of self-management training programs, their meaningful content and duration requires careful analysis and testing. Today, there are not enough practical recommendations and clear criteria for what criteria self-management training programs should meet. Physical therapy specialists are active developers of training programs and are involved in their implementation.

Based on the analysis of modern scientific data on the management of patients with COPD, 29 separate educational topics were identified, which are grouped into four substantive modules (symptom management; self-control, management of the consequences of the disease, family life, cooperation with society, healthcare specialists) and three main options were identified their implementation (full-time classes, web resources, and printed materials).

Conflict of interests. The authors declare that no conflict of interest.
Financing sources. This article didn't get the financial support from the state, public or commercial organization.

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Received: 01.11.2019.
Published: 30.12.2019.

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