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Knowledge And Opinions Of Individuals With Chronic Obstructive Pulmonary Disease About Long-Term Oxygen Therapy

Uzun Süreli Oksijen Tedavisi Uygulanan Kronik Obstrüktif Akciğer Hastalığı Olan Bireylerin Oksijen Tedavisi Hakkındaki Düşünceleri ve Bilgi Düzeyleri

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ABSTRACT

Aim: The aim of the study was to determine the feelings and thoughts of patients who have received long-term oxygen, the problems they experience, and their level of knowledge about oxygen use.

Material and methods: In the study, in-depth interviews were conducted with 12 patients who were treated in a training and research hospital and underwent long-term oxygen therapy. It was a qualitative study and the data were recorded on a voice recorder using a patient information form and a semi-structured interview form. After the data were analyzed, content analysis was conducted and reported.

Results: Three main themes and seven sub-themes were found through the analysis of the data. The main themes are reactions to long-term oxygen use, what is known about the issues to be considered in long-term oxygen use, and the effects of long-term oxygen use on patients. Conclusion. As a result of our study, it was found that patients with COPD who were on long-term oxygen therapy had limited knowledge about long-term oxygen use, oxygen use had positive effects on dyspnea and home activity management, made them feel good, but they had difficulties due to reasons related to the transportation of oxygen outside the home.

Keywords. COPD, knowledge level, long-term oxygen use, nursing, qualitative research.

ÖZ

Amaç: Araştırmanın amacı, uzun süreli oksijen kullanan hastaların oksijen kullanımı hakkında duygu ve düşünceleri, yaşadıkları sorunlar ve bilgi düzeylerinin belirlenmesidir.

Yöntem: Araştırmada bir eğitim ve araştırma hastanesinde tedavi gören ve uzun süreli oksijen tedavisi uygulanan 12 hasta ile derinlemesine görüşme yapıldı. Nitel bir araştırma olup, veriler hasta bilgi formu ve yarı yapılandırılmış görüşme formu kullanılarak, ses kayıt cihazına kayıt edildi. Veriler incelendikten sonra içerik analizi yapıldı ve raporlandırıldı.

Bulgular: Verilerin analizi ile üç ana tema ve yedi alt tema bulundu. Ana temalar; uzun süreli oksijen kullanımına verilen tepkiler, uzun süreli oksijen kullanımında dikkat edilmesi gereken hususlar hakkında bilinenler, uzun süreli oksijen kullanımının hastalar üzerindeki etkileri şeklindedir.

Sonuç: Yaptığımız çalışma sonucunda KOAH olan ve uzun süreli oksijen tedavisi uygulanan hastaların uzun süreli oksijen kullanımı konusunda kısıtlı düzeyde bilgilerinin olduğu, oksijen kullanımının dispne ve ev içi aktivite yönetiminde olumlu etkilerinin olduğu, kendilerini iyi hissetmelerini sağladığı, ancak ev dışında oksijenin taşınması ile ilişkili nedenlerden dolayı sıkıntı yaşadıkları saptandı.

Anahtar kelimeler: KOAH, bilgi düzeyi, uzun süreli oksijen kullanımı, hemşirelik, nitel araştırma.

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Introduction

Chronic Obstructive Pulmonary Disease (COPD) is a common, treatable, and preventable condition characterized by chronic airflow limitations and progressive respiratory symptoms (1). In COPD, long-term oxygen therapy (LTOT) is the most commonly used treatment method for acute and chronic respiratory failure (2). LTOT is recommended to be used for more than 15 hours a day (3,4). Oxygen therapy prevents pulmonary vasoconstriction, stabilizes or reduces pulmonary arterial pressure, improves pulmonary hemodynamics, increases exercise tolerance, improves sleep quality and profile, reduces dyspnea, polycythemia, and nocturnal arrhythmias (5,6), and decreases morbidity and hospitalizations (4,7).

Patients undergoing LTOT should be informed about issues such as concentrator cleaning and maintenance, use of a humidifier, and length of the connection hose (8). Especially when used in high concentration and for a long time, oxygen; It should not be forgotten that it may cause toxic effects such as hypoventilation, atelectasis, pulmonary oxygen toxicity, irritation, oxidative stress, and peripheral vasoconstriction (6,9). In oxygen therapy, accidents and fires associated with transportation, filling, and use of oxygen devices present the greatest risk (10). A distance of at least 1.5 m must be maintained between oxygen cylinders and heat sources and electrical appliances. Patients should be advised not to use oxygen therapy while smoking due to the risk of fire and explosion (11). To prevent facial and upper respiratory tract burns, it should be recommended not to have a beard and not to use hair care products containing alcohol and oil (12).

LTOT is a distressing treatment that restricts daily activities, and treatment compliance has been shown to be around 17%–70% (13). In a study by Anar et al. (2012), anxiety, and depression levels were found to be high in patients receiving LTOT and the reason for this was defined as the almost complete loss of functionality of patients receiving LTOT, dependence on people around them and oxygen concentrator, and inadequate family and community support (14).

In a study by Godoy et al. (8), it was found that patients who underwent LTOT did not comply with the recommended daily amount of oxygen use and flow meter setting, continued to smoke, and were exposed to cigarette smoke despite not smoking (8). Moreover, in a study by Gediktaş et al. (15), it was found that patients did not have sufficient knowledge about oxygen use and therefore received irregular and ineffective oxygen therapy (15).

By determining the thoughts and knowledge levels of individuals with COPD who undergo LTOT regarding oxygen use, training and approaches tailored to the needs of individuals can be provided. The aim of this study was to determine the feelings and thoughts, problems experienced and knowledge levels of individuals, who underwent LTOT, about oxygen use.

Material and Methods

The research was carried out in a phenomenological design with a qualitative research method. In line with this aim, the following questions were sought to be answered: (1) What are the perspectives of individuals diagnosed with COPD on home-based LTOT? (2) Do individuals diagnosed with COPD have sufficient knowledge about the process of applying LTOT at home? (3) What are the problems experienced by individuals diagnosed with COPD during the LTOT application process?

Population and Sample of the Study

The study was conducted with individuals diagnosed with COPD and who received LTOT in a hospital between October and November 2022. Patients to be interviewed in the study were selected by a non-probability-based, purposive, and homogeneous sampling method. Twelve patients who had been receiving oxygen therapy for at least 6 months, had no hearing and speech problems, were over 35 years of age, were inpatients in the chest diseases department, and agreed to participate in the study were interviewed. Patients who did not want to participate in the study, who had hearing-speech disabilities, who could not communicate due to speaking different languages, and who were diagnosed with major psychiatric illnesses (dementia, schizophrenia, etc.) were excluded from the study.

In qualitative research, there is no definite rule for the number of people to be included in the research. The sample size is determined mostly in line with the research question and its purpose. It is stated that it will be sufficient to continue the interviews until no new information emerges (16). For this reason, data collection was continued until the point where concepts and processes that could answer the research question started to repeat (saturation point). In this study, with 12 patients, the data collection process was completed with the feeling that the data was now repeating itself.

Data Collection Tools

The "patient information form" and "semi-structured interview form" created by the researchers were used as data collection tools. The patient information form includes questions about the patient's age, gender, how many hours a day they use oxygen, and information about oxygen use. There are three questions in the semi-structured interview form: (1) What were your feelings and thoughts when you learned that you needed to apply oxygen therapy at home? (2) How should be the use of oxygen at home, what should be considered? (3) How did your long-term use of home oxygen therapy affect your daily life? What kind of problems did you have? How has oxygen therapy made your life more comfortable?

Data Collection

The interview was conducted by an experienced female nurse who completed her master's degree. The researchers had no affiliation with the participants before the study began. During the interview, there was no one in the room except the participants and the researcher. The interviews were conducted in quiet, well-lit, single-person patient rooms where individuals could express themselves uninterruptedly. Patients were informed that their identity would remain confidential and that the information they provided would not be used for purposes other than scientific research. The patient was informed about the purpose of the interview and that a voice recorder would be used during the interview. Written and verbal consent was obtained before the interview. The researcher asked the patients the questions in the interview form and the interview was recorded on a voice recorder. The interviews lasted about 20 min. A second interview was not conducted with the patients.

Analysis of Data

Thematic analysis was used in data analysis. The interviews recorded with the tape recorder by the researcher were turned into written documents. The data turned into written documents were coded. The documented data were examined repeatedly and codes suitable for the purpose were obtained. Each code was a descriptive tag with a specific meaning in accordance with the research purpose. These codes and themes were then evaluated by the other researcher. After all the documents were coded, the codes obtained were evaluated together according to their similarities and sub-themes and themes were created. Documents were not provided to patients

for comment or correction. No feedback was requested from the patients about the codes obtained. A consensus was reached by the researchers about the codes and themes. Afterwards, all data were analysed and made into a report.

Measures Taken for Validity and Reliability

The validity of qualitative research is the observation of the subject as objectively as possible. For this, methods such as participant confirmation, peer confirmation, and expert review should be used. The collected data should be presented directly with a descriptive approach. To ensure the internal reliability (consistency) of the research, the collected data should be presented directly with a descriptive approach (17). Interviews were conducted without any guiding behaviour or subjective judgments. To ensure the internal validity of the study, the patient information form and semi-structured interview questions were created and the literature on LTOT and patients using this treatment was reviewed. To ensure the internal reliability of the research, all the findings were given directly without comment. After the interview, patients were asked if there were any issues they would like to add or remove.

Ethical Aspect of Research

Ethics committee approval was received from Istanbul University-Cerrahpaşa Social and Humanities Research Ethics Committee (approval dated 27/05/2022 and numbered 2022/150). All participants gave their informed consent before participating in the study. The study was conducted in accordance with the Declaration of Helsinki.

Results

The data obtained from 12 patients with COPD who underwent LTOT in the study are shown in Table 1.

Three main themes and seven sub-themes were identified from the reported data. The distribution of main themes and sub-themes is shown in Table 2.

Main Theme 1. Responses to long-term oxygen use

In line with the information provided by the patients, two sub-themes were created under the main theme of "responses to long-term oxygen use".

Sub-theme 1.1. Positive responses to long-term oxygen use

It was determined that the patients expected to use oxygen for a long time, felt that oxygen use would be good for them, and were satisfied with this situation.Patients stated that they were happy and delighted when they learned that they would be using oxygen for a long time.

"I did it willingly. I felt nothing. I was not surprised. Because I knew it would happen. I had COPD for 8-9 years before, so I knew it was coming." (Patient 2)

"Well, it was very nice" (Patient 7)

"I wanted to feel fine at that moment. I felt that I would be fine" (Patient 8)

Sub-theme 1.2. Negative responses to long-term oxygen use

It was determined that patients' learning that they would continue their lives with a device they did not know caused them to develop negative feelings towards oxygen use. Patients stated that they were worried and upset when they learned that they would be using oxygen for a long time. It was found that they developed a positive perspective after they were informed about the use of oxygen and felt that oxygen therapy was good for them.

"When I found out, I was hesitant at first. I will continue my life dependent on oxygen. This is the case. So I was afraid. I am now informed. We need oxygen care every week because I know." (Patient 1)

"At first I felt very bad. I felt like I could live connected to the machine. But when I saw its benefits, of course, I learned it on my own and I'm trying it right now. Inevitably, it throws you off balance because something that you are not used to comes across and you do not know what to do. But we must get used to it in time." (Patient 5)

"They already gave it to me in the hospital. I said, I guess I will have a machine next to me from now on. That's all. I mean, I was upset about something else." (Patient 3)

"I hesitated. How to use it. I learned how to use the machine after being hospitalized here after learning it. Then I thought it would be to my benefit." (Patient 4)

"At first I was afraid of the machine. It is not easy to live with them. It's hard to get used to. I couldn't get used to it at first. But then, you get used to it. So it's not possible without them anymore. Because it is superb when you get used to it." (Patient 11)

"I just felt bad. You feel that you are falling behind in healthy living. That's the first thing. You get used to it. You're going where life isn't that bad. A new life enters the life that oxygen enters. It becomes your life companion. Without it, you have a hard time." (Patient 12)

Main Theme 2. What is known about the points to be considered in long-term oxygen use?

In line with the information provided by the patients, three sub-themes were created under the main theme of "What is known about the issues to be considered in long-term oxygen use".

Sub-theme 2.1. Moisturizing

It was determined that the patients paid attention to the issues of filling the water tank to the maximum and washing and drying the water tank during long-term oxygen use.

"Now I must change the water, wash the jar and add water again." (Patient 1)

"We check if there is water in the bottle." (Patient 2)

"There is water in this big machine. I'll take that one, it's the same one. So this is a bit over the level. Over the level." (Patient 4)

"We were told to change the water daily, that it should be at the bottom of the maximum, so we leave it there." (Patient 6)

"We check the water level. It must not run out of water. Water must be" (Patient 8)

"You must change the water in five days." (Patient 9)

"Yes, I was putting some (water) at home. It was good for me." (Patient 11)

"We always use with water. It has indicators. As soon as it goes below the mark, you must put the water in." (Patient 12)

Sub Theme 2.2. Flowmeter adjustment.

It was found that the patients knew the need for flowmeter adjustment in oxygen use. The patients' have explained that they made adjustment of flowmeter by their as taught.

"The doctor already determines it, adjusts it according to the doctor's thing, we use it." (Patient 1)

"When we looked at its ball, there was this bead. If that bead

Table 1. Patient information form data

Patients	Gender	Age	Oxygen use time at home	Daily oxygen usage time (hours)	Oxygen flowmeter setting (lt/min)	Status of traininig about the use of oxygen
Patient 1	Male	62	1 year	1	2	No
Patient 2	Male	75	6 mount	24	4	No
Patient 3	Male	46	6 mount	24	3	Yes
Patient 4	Male	67	3year	16	3	Yes
Patient 5	Female	39	6 mount	10	5	Yes
Patient 6	Female	75	1 year	24	2.5	Yes
Patient 7	Male	76	8 mount	24	5	No
Patient 8	Female	64	6 year	20	1.5	Yes
Patient 9	Male	70	1 year	20	3	Yes
Patient 10	Male	68	3 year	15	3	Yes
Patient 11	Female	42	1 year	20	5	Yes
Patient 12	Male	63	13 year	10	2.5	Yes

Tablo 2. Main themes and sub-themes

Main Theme	Sub-theme	n (declaration)
Responses to long-term oxygen use	Positive responses to long-term oxygen use	3
	Negative responses to long-term oxygen use	6
What is known about the points to be considered in long-term oxygen use?	Moisturizing	7
	Flowmeter adjustment	8
	Maintenance of the device	5
Effects of long-term oxygen use on patients	Making feel fine	7
		7

goes up, you adjust accordingly. So you can do it there. The one at home will be at 3 at the most. Maybe at 4." (Patient 4)

"I must use the flowmeter between 5 and 6. I use an average of 5.5." (Patient 5)

"We were told that the standard should be used at 2.5." (Patient 6)

"It will be in the same setting, as I just said (flowmeter) it will not be too much. 1.5." (Patient 8)

"I know there is a setting. It needs to go from 3." (Patient 9)

"They adjusted it from where we got it (flowmeter). We use it accordingly. It goes from 5-6." (Patient 11)

"Well, as I said, from the highest to the lowest, of course. At 2.5" (Patient 12).

Sub Theme 2.3. Maintenance of the device

It was determined that patients were knowledgeable about device maintenance. The patients stated that device maintenance and filter changes were made at certain intervals.

"There is a certain time to change the filters." (Patient 1)

"It takes 2 years to change the filter and I changed it in one year." (Patient 6)

"When the 5 months are up, I will take it to the service. Well will do maintenance." (Patient 9)

"Device is serviced. We have it serviced every two years." (Patient 11)

"Even mechanics say that. When it goes to the maintenance." (Patient 12)

Main theme 3. Effects of long-term oxygen use on patients

In line with the patients' explanations, two sub-themes were created under the main theme of "The effects of long-term oxygen use on patients".

Sub Theme 3.1. Making feel fine

It was determined that long-term oxygen use had positive contributions to the patients' treatments, improved their current health levels and made them feel good because it enabled them to do indoor activities more comfortably. Patients stated that LTOT was good for them, that it eased their breathing, and that they felt bad if they did not use oxygen.

"If you don't use it, you can't sustain your life. When you put it on, the oxygen gives a comfort. In short, it saves lives and gives breath." (Patient 1)

"Oxygen has its benefits. It made my breathing easier." (Patient 2)

"But when you use it regularly, I see the benefits very well. I got better." (Patient 5)

"No, it didn't cause any problems. No, it's comforting. It did me good to be well." (Patient 7)

"Well, it felt very good for us to get this oxygen. I feel bad when I don't use it. I couldn't walk properly. You can't go down the stairs, you can't breathe, so this relaxes your body." (Patient 4)

"So far so good. It's a good day for us. It relaxes me." (Patient 9)

"I could never walk, I couldn't do any work. There was some

strength when there was oxygen." (Patient 11)

Sub-theme 3.2. Restrictions on daily activities

It was determined that the patients' experienced restrictions in daily activities due to their dependence on the device both inside and outside the home. Patients stated that they experienced restrictions in daily activities due to dependence on the device, restriction of movement within the home, transportation of the device, and difficulty in accessing electricity outside the home.

"When you want to go somewhere, you can't go because it is plugged into the electricity. It is not clear when it (shortness of breath) will come, whether you are stuck in the evening or during the day, I wear it when I am stuck." (Patient 1)

"If we want to go out and look for something, we can't. Because you will constantly transfer the tube to the chair, you will put the tube on and then you will go." (Patient 2)

"You can't cook, you can't do your work, it affects everything. You are connected to a machine." (Patient 5)

"I can't say anything. I can't go to the restroom. I can't take a bath comfortably, so..." (Patient 3)

"There are many ways in which it makes life difficult. You can't go anywhere. When you go to your hometown, you'll carry it back and forth. That's the way it is. You are having difficulties." (Patient 10)

"I cannot take my son to school as he wants. His grandmother brings him. I can't do the hustle and bustle. I was very active in the house, I was not like that." (Patient 11)

"When you start using oxygen, you can no longer move on your own. You've got a man with you. On the way to and from the hospital. You wear oxygen all the time. Yes, you start to depend on someone." (Patient 12)

Discussion

Psychosocial responses to the disease are all cognitive, emotional, and behavioral responses that occur to protect the psychological integrity of the patient (18). The most common emotional reactions that generally occur in patients are anxiety, fear, anger, powerlessness, sadness, inadequacy, failure, shame, guilt, hope-despair, and relief. Ellis and Nowlis (19) defined the disease process in patients with physical illness in five stages after the onset of the disease: disbelief and denial, irritability and anger, attempt to gain control, depression, acceptance, and cooperation (19). In the sub-theme of "Positive responses to long-term oxygen use" in this study, patients stated that they were happy and delighted when they learned that they would use long-term oxygen. In the sub-theme "Negative responses to long-term oxygen use", it was determined that patients were worried and upset when they learned that they would use long-term oxygen, but developed a positive perspective after they were informed about oxygen use and felt that oxygen therapy was good for them. The patients' statements are similar to the psychosocial reactions to the disease encountered in the literature.

The application of LTOT is decided by arterial blood gas values (20,21) and should be applied at a certain flow rate (22). Oxygen therapy given at high concentrations for a long time and without humidification causes drying and irritation in mucous membranes (23,24). To prevent drying and irritation of the mucous membranes, if the oxygen flow is above 4lt/min, oxygen should be used by humidifying it (8,22,25,26). In a study, it was found that 97% of patients used oxygen by humidifying (8). In this study, under the main theme of "What is known about the issues to be considered in long-term oxygen use", in the sub-theme of "Humidification", it was determined that patients had knowledge about humidification in long-term oxygen use. In the sub-theme "Flowmeter adjustment", it was found that patients were informed about the need for flowmeter adjustment. The data obtained are similar to those reported in the literature.

Device maintenance and adjustments are important for optimal benefit from the devices (27). The filters of the devices should be cleaned regularly and replaced according to the manufacturer's instructions (28). In a study, it was reported that 34.2% of patients had regular device maintenance and 65.8% did not have regular maintenance (27). In this study, in the sub-theme of "Device Maintenance", patients stated that they had device maintenance and filter replacement at certain intervals. It was determined that the patients had knowledge about device maintenance in the use of oxygen.

Dyspnea is a common and uncomfortable symptom for patients with COPD. Dyspnea management includes optimized COPD treatment with bronchodilators, pulmonary rehabilitation, regular use of low-dose opioids, and home oxygen therapy (29). Although it has been reported that LTOT may help to improve respiratory and general health-related quality of life (5), there are also studies reporting that long-term supplemental oxygen does not reduce dyspnea in daily activities, does not affect health-related quality of life (30,31,32) and does not have a consistent benefit in relation to depression, anxiety or functional status measures (33). In a study, 85.5% of patients receiving LTOT stated that they benefited from oxygen use, whereas 11.8% stated that they did not benefit (27). In this study, there is a sub-theme of "feeling good" under the main theme of "The effects of long-term oxygen use on patients". When the literature is reviewed, it is reported that there is no consistent benefit of long-term oxygen therapy in terms of decreased dyspnea level, quality of life, depression, anxiety, or functional status measurements in patients using oxygen. Yet, in this study, patients stated that LTOT was good for them, that it relieved their breathing, and that they felt bad if they did not use oxygen.

Caregivers of oxygen-using patients play an important role in the management of oxygen equipment outside the home (28). n a study conducted with patients using portable oxygen, it was reported that patients were afraid that the oxygen would run out of the cylinder when they were away from home and that the cylinder was heavy to carry (33). Tanrıverdi and Hasanoğlu (34) reported that patients experienced problems related to the restriction of movement (34). Moreover, in another study, it was reported that oxygen use restricted patients' travel (30%) and socialization (22%) (35). In this study, regarding the sub-theme of "restriction in daily activities", patients reported dependence on the device because they needed to use oxygen continuously, restriction in daily activities due to limitations of movement within the house, the transportation of the device, difficulty in accessing electricity outside the house, and problems when going out of the house. Patients' statements about the restriction of movement are similar to the findings in the literature.

Conclusion

LTOT is among the preferred methods in the management of COPD. Based on the results of the study, it was found that LTOT application had positive effects on dyspnea and in-home activity management in patients with COPD, and made the patients feel better, but they experienced difficulties due to reasons related to the transportation of oxygen outside the home. It is crucial for the patients who have undergone LTOT to have knowledge about the use of oxygen to maintain the treatment effectively and reliably. Based on the results of the study, it has been determined that patients have a partial understanding of the uses of oxygen. It is recommended that patients should be

trained to maintain LTOT effectively and reliably and that the training should be repeated according to patient needs.

It is recommended that the study be conducted with larger sample groups.

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Conflicts of interest

The author(s) declare no competing interests.

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