

# Validation of educational material for hospital discharge of patients with prolonged domiciliary oxygen prescription

*Validação de material educativo para alta hospitalar de pacientes com prescrição de oxigenoterapia domiciliar prolongada*

*Validación del material educativo para el alta hospitalaria de pacientes con oxigenoterapia domiciliar prolongada*

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## ABSTRACT

**Objective:** The aim of this study was to validate the content and understandability of the instrument of written communication, complementary educational material to hospital discharge for patients with prolonged home oxygen prescription. **Methods:** This is a descriptive study, in which a quantitative approach was used. In this study we developed an educational material in the form of folder regarding the use of oxygen, which was analyzed by five nurses, who suggested modifications. After completion of the folder changes, it was given to patients receiving Prolonged Home Oxygen therapy (PHO). **Results:** The assessment that patients had regarding the educational material was positive, as 100% of respondents rated themselves between good and excellent (or scores between 7 and 10). **Conclusion:** The role and function of nurses as health educators is confirmed since they need to use verbal and written communication to the healthcare process.

**Keywords:** Communication; Health Education; Nursing; Oxygen Inhalation Therapy.

## RESUMO

O objetivo deste estudo foi validar o conteúdo e a compreensibilidade do instrumento de comunicação escrita, material educativo complementar à alta hospitalar para pacientes com prescrição de oxigenoterapia domiciliar prolongada. **Métodos:** Estudo descritivo, com abordagem quantitativa, no qual se elaborou um material educativo sobre uso de oxigenoterapia, em forma de folder. Este foi analisado por cinco enfermeiros, que sugeriram modificações. Após a realização das alterações no folder, este foi entregue aos pacientes que receberam a prescrição de Oxigenoterapia Domiciliar Prolongada (ODP). **Resultados:** A avaliação que os pacientes tiveram quanto ao material educativo foi positiva, pois 100% das respostas se classificaram entre excelente e bom (ou notas entre 7 e 10). **Conclusão:** Confirma-se o papel e a função do enfermeiro como educador em saúde, que necessita utilizar a comunicação verbal e escrita para o processo de cuidar em saúde.

**Palavras-chave:** Comunicação; Educação em saúde; Enfermagem; Oxigenoterapia.

## RESUMEN

**Objetivo:** Validar el contenido y la comprensibilidad del instrumento de comunicación escrita, material educativo complementario al alta hospitalaria de pacientes con prescripción de oxígeno domiciliario prolongado. **Métodos:** Estudio descriptivo con enfoque cuantitativo, que resultó un material educativo sobre el uso de oxígeno en forma de carpeta. Esto fue analizado por cinco enfermeras, quienes sugirieron modificaciones. Después de efectuarse los cambios de la carpeta, la entregaron a los pacientes que recibieron prescripción de oxígeno domiciliario prolongada (ODP). **Resultados:** La evaluación de los pacientes cuanto al material educativo fue positiva, ya que el 100% de las respuestas se calificaron entre excelente y bueno (notas entre 7 y 10). **Conclusión:** Se confirma el papel y la función de la enfermera como educadora de salud, que necesita la comunicación verbal y escrita para el proceso de atención en salud.

**Palabras-clave:** Comunicación; Educación en Salud; Enfermería; Terapia por Inhalación de Oxígeno.

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## INTRODUCTION

Nurses, for their training and professional practice, have an ethical responsibility in the teaching-learning of individuals and collectivities, and it is their duty to carefully determine what they need to know and find out the moment when these individuals will be ready to learn, as well as to make use of interventions to ensure continuity of self-care<sup>1</sup>.

It is observed in clinical practice that the orientation of the hospital discharge is given to patients when they leave the hospital. On this occasion many guidelines are offered simultaneously, mostly by means of verbal communication, making it difficult for patients to understand them<sup>1,2</sup>.

On patient education, both verbal and written information are important and complementary. It is also possible that the patient does not understand the verbal information or forget it or reject it. The provision of written information has been an effective way to support the verbal guidance on therapies<sup>2</sup>, specifically when it comes to care in chronic conditions, requiring long-term adaptations, among which we can mention the use of prolonged home oxygen therapy (PHO).

The PHO is the only proven treatment modality that alters the course of the chronic obstructive pulmonary disease (COPD), and it was demonstrated that its daily administration for more than 15 hours has benefits such as improvement in hypoxemia at rest, depression, cognitive function, quality of life, physical exercise, capacity and hospitalization frequency. In addition, it stabilizes and sometimes reverses the progression of pulmonary hypertension, and decreases cardiac arrhythmia and electrocardiographic findings indicative of myocardial ischemia<sup>3</sup>.

In the State of São Paulo, a state law standardized the use of home oxygen (SS Resolution-213 of 06/30/92 published in the DOE of 7/1/92)<sup>4</sup>. However, few patients are aware of this program. When they are diagnosed with COPD, pulmonary fibrosis or bronchiectasis, many questions emerge.

To ensure continuity of care at home, it is necessary that the hospital discharge is planned and systematized<sup>1,5</sup>. The discharge plan is to develop an individualized plan for the hospitalized patient who may be discharged at any time<sup>1</sup> and, in which the nurse, fulfilling his educational role, advises the patient/family since his hospitalization until the moment of discharge<sup>6</sup>.

Therefore, one understands the need to validate the content and comprehensiveness of complementary educational material for hospital discharge for patients prescribed with prolonged home oxygen therapy, so that the study will contribute to the dissemination of knowledge about the use of home prolonged oxygen therapy by means of an accessible and comprehensive educational resource for the users of this therapy, also assisting in the quality of nursing care and treatment success.

## LITERATURE REVIEW

Respiratory diseases are a major problem for today's society. According to the World Health Organization (WHO), the five most

common respiratory diseases account for 17.4% of deaths in the world<sup>1</sup>. In Brazil, respiratory diseases are the most common causes of care in emergency rooms and hospitalizations<sup>7,8</sup>.

The latest WHO report (2006) shows that in Brazil there are 15 million people suffering from asthma, 20 million with allergic rhinitis and five million with COPD; therefore, it is estimated that two out of ten Brazilians are affected by a chronic respiratory disease<sup>4,9</sup>.

COPD is a disease characterized by the presence of long-term respiratory symptoms: cough, sputum production and dyspnea (shortness of breath), it is progressive and incurable. Symptoms usually appear after the age of 40, in patients who had a prolonged tobacco use: about 90% of patients with COPD smoke or have smoked and yet 15% of smokers develop this condition<sup>10</sup>.

The effects of hypoxemia in the short term include increasing respiratory distress, vascular dilation with increased heart rate and cardiac output, regional pulmonary vasoconstriction, high levels of erythropoietin, and increased blood viscosity. The long-term effects include pulmonary hypertension, right ventricular failure and polycythemia. Respiratory failure is found only in stage four of the very severe COPD, in which partial arterial pressure of oxygen ( $\text{PaO}_2$ ) is lower than 60 mmHg and may be accompanied by a stressed expiratory volume at 1<sup>st</sup> s (FEB1) 30% smaller than anticipated<sup>10</sup>.

Respiratory failure can lead to secondary effects on the heart, known as *cor pulmonale* or right heart failure. Clinical signs include elevation of the jugular venous pressure and ankle edema. Respiratory failure is classified as type I (hypoxemic); respiratory failure type II (hypercapnic) and; respiratory failure. In hypoxemic respiratory failure,  $\text{PaO}_2$  decreases to less than 60 mmHg, and arterial pressure of carbon dioxide ( $\text{PaCO}_2$ ) is normal or low. The clinical signs of hypoxemia include restlessness, confusion and coma. In type II respiratory failure,  $\text{PaO}_2$  is also low, while  $\text{PaCO}_2$  appears increased. The clinical signs of hypercapnia encompass drowsiness, tremors, warm extremities and headaches. Approximately 10-15% of patients with COPD have respiratory distress type II<sup>10</sup>.

The normal range for  $\text{PaO}_2$  is 80 to 100 mmHg, and the normal range to  $\text{PaCO}_2$  is 35 to 45 mmHg. Typically, the high  $\text{PaCO}_2$  stimulates the respiratory ability to reduce these levels by increasing the respiration. This stimulation is decreased, however, in the type II respiratory failure, and the low  $\text{PaO}_2$  triggers hypoxemia<sup>10</sup>.

The goal in managing the treatment of respiratory failure is to reverse hypoxemia, preventing increases in hypercapnia, which can be fatal in people who retain carbon dioxide ( $\text{CO}_2$ ), and prevent tissue hypoxia<sup>10</sup>.

The PHO is considered an important non-pharmacological treatment for patients with chronic respiratory insufficiency. It is known that oxygen therapy reverses polycythemia secondary to hypoxemia, improves pulmonary hypertension as well as the ejection fraction of the right ventricle, reduces cardiac

arrhythmias, reduces dyspnea, improves neuromuscular and neuropsychic functions, increases exercise tolerance, prevents and/or reduces the number of hospitalizations and improves the quality of life of the patients who dependent on this therapy<sup>11,12</sup>.

According to the Brazilian Society of Pneumology and Tisiology<sup>6</sup> and the Brazilian Council for COPD<sup>15</sup>, continuous PHO (at least 15 hours a day) is indicated when  $\text{PaO}_2 \leq 55$  mmHg or  $\text{SaO}_2 \leq 88\%$  and,  $\text{PaO}_2$  from 56 to 58 mmHg or  $\text{SaO}_2$  89% associated to edema due to heart failure, evidence of *cor pulmonale* or hematocrit  $> 56\%$ <sup>12-14</sup>.

Canadian guidelines state as criteria for the use of PHO  $\text{PaO}_2 \leq 55$  mmHg or  $\text{PaO}_2 < 60$  mmHg (with comorbidities). Patients with persistent hypoxemia ( $\text{PaO}_2$ : 56-60 mmHg), hypoxemia documented limited to exercise and improved by means of supplemental oxygen, or nocturnal hypoxemia, are also eligible for PHO, as well as patients with exertional hypoxemia without hypoxemia at rest<sup>10</sup>.

## OBJECTIVE

Validate content and comprehensibility of the instrument of written communication, complementary educational material for hospital discharge for patients prescribed with prolonged home oxygen therapy.

## METHOD

This is a descriptive cross-sectional study, conducted at the Pulmonary unit of a university hospital in São Paulo, after approval by the Research Ethics Committee<sup>15</sup> of the Federal University of São Paulo, under the number CEP 1663/10, and which data collection was carried out from May to August 2011.

The population of this research consisted of patients prescribed with PHO, admitted to the Inpatient Unit of Pneumology of the hospital, during of data collection.

Patients with PHO prescription were selected according to the inclusion criteria: aged over 18 years, of both sexes, indicating the use of home oxygen therapy and who agreed to participate in the survey duly signing the Instrument of Informed Consent.

The exclusion criteria were: patients with altered level of consciousness; visual disturbances that interfere with reading of the brochure and; illiterate.

Data collection occurred in four phases: 1) the educational leaflet was developed from a literature review; 2) the developed instrument was sent to five nurses who had specialist titles, working in the area for at least two years for reviewing and analysing the educational material; 3) after the modifications suggested by the nurses, the educational brochure in its final version was delivered to patients as soon as they received the prescription of PHO; 4) after a period of two to four days (the time the patients had available for reading, rereading and exploring the educational leaflet) a semi-structured and self-administered questionnaire containing demographic questions and issues related to the evaluation of the educational material on his needs was applied.

The instrument used in the 2<sup>nd</sup> phase of data collection consisted of a questionnaire that was delivered to nurses with five open questions, with the objective of evaluating the educational material developed in the Phase 1 of the research.

The four questions were: 1) Did you find that the language used in the brochure was clear enough for the understanding of patients? Would you suggest changing any word? 2) Do you think that the brochure is visually appealing? Would you suggest any improvement? 3) Do you think that the information contained in the brochure is complete? Would you suggest any improvement for any of the issues? 4) Do you miss any important information in the brochure?

The instrument used in the 4<sup>th</sup> phase of data collection consisted of a self-administered questionnaire with semi-structured questions to the patients. There were inquiries for demographic characteristics and four questions, which are: 1) Did you find it visually appealing? 2) Did it help you understand the aspects of oxygen? 3) Was the information clear and easy to understand? 4) Do you think the brochure lacked information?

The first three questions had as an option of response: Excellent, Good, Fair and Poor, and the questionnaire explained that, for better understanding of this classification by the reader, Excellent grades would amount to 9.0 or 10.0, Good grades would amount to 7.0 or 8.0; Regular grades would amount to 5.0 or 6.0 and; Poor grades would amount to scores lower than 5.0. The question 04, in turn, had the option to answer Yes or No. Furthermore, all questions (01-04) offered the option of adding suggestions for improvements of the brochure.

An Office Excel spreadsheet for Microsoft Windows was created. In this spreadsheet the data collected in the last phase of the research were inserted. Numerical variables were presented with median and variation values with minimum and maximum scores. Categorical variables were expressed as absolute numbers and relative numbers.

## RESULTS

In the first stage of the study the written educational material was prepared in a booklet format on the theme: Prolonged Oxygenotherapy Homecare. The material was prepared in two sulphite sheets A4 size, used on front and back, attached to one another in a book format (folded in half and stapled), totaling eight spaces (half-sheet) for the preparation of the educational material.

Its final structure is given in the following order: Cover; "What is Oxygenotherapy?"; "Why do I need this therapy?"; "How can I do this therapy?"; "Energy Conservation"; "And what do I do when I feel short of breath?"; "Interesting to Know "; "Websites that can help" and; Back-Cover.

The material has been prepared in popular, clear, concise language, relying on figures (images) as attractive features. Still thinking about the visual appeal, in addition to the figures, we used text boxes, colored letters and color printing in the whole material (100%).

The second phase consisted of validation of the brochure, which was made by consulting five nurses with specialist titles, acting in the field of pulmonology at least two years.

In presenting the results, to preserve the anonymity of the nurses, they were referred to as N1, N2, N3, N4 and N5.

For question 1 "Did you find that the language used in the brochure was clear enough for the understanding of patients? Do you suggest changing any word?", nurses N1 and N5 suggested the change of terms "expire" and "inspire" for the terms "pull" and "drop". The other nurses considered the language clear with no suggestions of changes.

Regarding question 2 "Do you think the brochure is visually appealing? Would you suggest any improvement?", N1, N2 and N5 considered the brochure attractive and did not suggest any improvement. N3 suggested that, in the cover of the booklet, in addition to the title "Prolonged Homecare Oxygentherapy" the sentence "Guidelines and recommendations to patients and families" should be added, emphasizing that the family is an important partner in the success of treatment and that it should always be included in the guidance and care programs. N4 suggested that a picture symbolizing that the patient should stay away from heat sources was added.

In the case of Question 3 "Do you think that the information contained in the brochure is complete? Would you suggest any improvement for any of the issues?" N1 suggested that emphasis be given to the fact that patients will continue to have a normal life even using the PHO just respecting their limitations. N2 suggested that the text on energy conservation should be improved, giving more examples such as the organization of food in the fridge. N3 suggested a better elaboration of the sentence under the title "Interesting to Know" regarding the replacement of the nasal cannula. N3 also suggested emphasizing the importance of staying away from heat sources and importance of the appropriate use of the therapy (following medical indication). N5 suggested the number of the Municipal Act, which ensures that patients should receive the necessary equipment PHO for free from the prefecture, to be exposed.

To the last question "Did you miss any important information in the brochure?" the nurses N1, N2, N3 and N4 suggested that emphasis be given to the fact that patients should not alter the level of oxygen on their own. N1 suggested that it should be added to the text under the heading "Interesting to Know" that the patient should not hold the oxygen cylinder by the valve and that one should not approximate the oxygen equipment to heat sources. N2 suggested the emphasis on the fact that, if dyspnea (breathlessness) is constant even with use of the PHO, one should seek medical advice. Finally, N3 also suggested that, in the persistence of the symptoms of the underlying disease, the physician should be seen.

All suggestions described were accepted and the necessary changes were made with two exceptions: no figure (simple line drawing) to symbolize that patients should keep the PHO equipment away from heat sources was found and; it was not added to the text under the heading "How can I do this therapy?"

the number of the law which recognizes patient's right to receive the required equipment for free. It so happens because this is a state law, but the program is municipal, and it was considered that, if they received too much information, it would be more confusing than enlightening.

During the study period, 16 patients who were prescribed PHO received the leaflets. Of these, 10 (62.5%) were female and six (37.5%) were male.

The average age was 65.5 years, ranging from 47 years to 75 years.

The results obtained from the evaluation of the educational brochure, performed by patients who have been prescribed PHO, are shown in Table 1.

The assessment of the educational material developed was positive, as 100% of respondents rated themselves between Excellent and Good (or grades between 7.0 and 10.0), which is why the table does not show all the answer options that patients had in the questionnaire (Excellent, Good, Fair and Poor). There was also no improvement suggestion by the patients.

## DISCUSSION

Educational materials play an important role in the process of health education, as they not only facilitate the mediation of the learning content, but also function as a resource readily available so that patients and their families can refer to it when faced with uncertainty in the development of care. It is noteworthy that the increasing use of educational materials as resources in health education has assumed an important role in the teaching-learning process, especially in the therapeutic intervention of chronic diseases<sup>16</sup>.

Given that the use of home oxygen therapy involves dealing with new knowledge, skills and care for the patient/family; therefore it is of utmost relevance educational practices performed both at the moment of hospital discharge as the primary multidisciplinary teams of health care so that proper care and adherence to therapy can be maximized, thus minimizing possible failures in the treatment goal.

In a study conducted in Botucatu, São Paulo, using home visits to patients on oxygen therapy, the authors found that most patients did not use the treatment as prescribed. In the year prior to the home visits, 38% of the patients had undergone emergency room visits, 32% of the patients reported not sleeping properly, a fact attributed to the noise of the oxygen device and dyspnea<sup>17</sup>.

In England flaws in the prescriptions of home oxygen therapy were also found, highlighting the absence of registration of the doctor who initiated the therapy, lack of information on the time use of home oxygen and lack of information about levels of oxygen saturation and carbon gas<sup>18</sup>.

The choice of the leaflet model, aimed to function as an additional and potential resource for patient compliance to a prolonged home oxygen therapy was given due to the amount of information that would be needed for better understanding of the patient.

**Table 1.** Evaluation of the educational brochure held by patients. São Paulo 2011

Question	Answer	Absolute Nº (n = 16)	Relative Nº (%) (n = 100%)
Visually Appealing	Excellent	14	87.5
	Good	02	12.5
It helped to understand the PHO aspects	Excellent	11	68.75
	Good	05	31.25
Clear and easy to understand information	Excellent	14	87.5
	Good	02	12.5
Lacking information	No	16	100

The written material was prepared in clear and concise language, this being a concern, given that the author of a message should pay attention to the appropriate language in the communication process in health<sup>16</sup>. The scientific language used in the written material hinders the understanding of the reader; therefore, the written text should be brief, direct and present a correct and understandable language to the recipient.

An easy to understand information improves knowledge and the coping of patients suffering from chronic diseases, helps develop attitudes and skills, facilitates autonomy, promotes adhesion and helps patients to understand how their own actions influence health standards<sup>16</sup>.

In a review focusing on the factors related to adherence to prolonged home oxygen therapy, a study found that 55% of patients had not received full written instructions regarding the use of PHO and 63% were not aware of the importance of PHO in the therapeutic management of their diseases, indicating that the lack of explicit guidelines in the prescription and the prescription revision are limiting factors for accession. In addition, poor adherence may suggest that the patients may not receive the clinical benefits that have been described by the continued use of PHO<sup>3</sup>.

It is important that, in the preparation of an educational material, the authors adapt the language needs of the target population, considering the current moment of the society in which this population is located. Thinking about it, it was considered extremely valuable as supplementary information to add sites that could help patients and families/caregivers to better understand the aspects of this therapy.

During the preparation of the booklet (first phase of the methodology of this research), we observed the importance of educational materials in the practice of health education, taking into account that the therapeutic efficacy improves as patients get to know their illness and take part in their treatment.

Based on these concepts we considered the suggestions given by the five nurses participating in this study, very important, since all of them work in the area, deal with the orientation of these patients on daily basis, are the main disseminators of information to patients with prescription of PHO in the process of hospital discharge and know the most frequent questions of these patients and the biggest difficulties they face as educators at the time of health education in the healthcare scenario.

Thus, from the second phase of the methodology of this research (assessment of nurses), it is ratified that in patient education, both verbal and written information are important and complementary. The provision of written information by means of leaflets is a complementary way to support the verbal advice given to patients 2 and can assist in adherence to home treatment using oxygen.

Finally, the positive results found at the end of the fourth and final phase of this research (patient assessment) demonstrates that the educational brochure on PHO was evaluated positively by patients, and this material can be used by nurses from the Pneumology Internment Unit of the hospital locus of the research as a tool to support and complement the guidelines for hospital discharge.

## CONCLUSION

Most patients evaluated satisfactorily the educational material presented, so that it will help to optimize the use of prolonged home oxygen therapy in patients requiring such treatment, helping to reduce crises and complication.

By using the knowledge of nurses that deal with the experience of the hospital discharge plan to individuals who use the prolonged home oxygen therapy, the suggestions presented were reviewed so that the brochure could fulfill its purposes for the main actors of the teaching-learning process (educator and student).

By the nature of the material presented constant revisions are necessary, taking into account that the scientific technical knowledge is constantly updated.

The role and function of nurses as health educators is confirmed, since they need to use verbal and written communication in the healthcare process, with a view to achieving excellency in the health education process.

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