



## ORIGINALES

### Health promotion behaviors and physical dependence in people with clinical diagnosis of chronic obstructive pulmonary disease

Conductas promotoras de salud y dependencia física en personas con diagnóstico clínico de enfermedad pulmonar obstructiva crónica

Claudia Liliana Valencia Rico <sup>1</sup>  
Olga María Henao Trujillo <sup>2</sup>  
Felipe Antonio Gallego <sup>3</sup>

<sup>1</sup> Nurse, Specialist in Cardiopulmonary Rehabilitation, Magister in Nursing with emphasis on adult and care for the elderly. Nursing Professor at the Faculty of Nursing of the Catholic University of Manizales, Colombia.

<sup>2</sup> Nurse, Specialist in Health Administration. Student of the Master Program in Education. Nursing Professor at the Faculty of Nursing of the Catholic University of Manizales, Colombia.

<sup>3</sup> Mathematician, Magister in Applied Science and Mathematics. Statistician at the Research and Post-graduate Education Direction of the Catholic University of Manizales. Colombia.

E-mail: [cvalencia@ucm.edu.co](mailto:cvalencia@ucm.edu.co)

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#### ABSTRACT:

**Objective:** To describe health promotion behaviors and the degree of physical dependence in people with chronic obstructive pulmonary disease (COPD) diagnosed.

**Methodology:** This study employed a quantitative correlational approach in which a probabilistic sample of 125 people was obtained. A health-promoting lifestyle Profile II Spanish version and the Barthel Index scale were applied.

**Findings:** The 68.8% of the participants were females. The most prevailing diagnostic was unspecified COPD 67.2%. As exposition factors several aspects as tobacco use 35.2%, this factor along with the exposition to the biomass smoke were identified at 32.8%. Regarding the health promotion behaviors, there was evidence of a low average in the dimensions related to physical activity and nutrition; a high average in their spiritual growth, in both, men and women. The 92.8% of the sample population were independent regarding basic activities of their daily life. Some statistically meaningful associations were identified in some dimensions of the health-promoting lifestyle Profile II with: age groups, supplementary oxygen use and biomass smoke exposition.

**Conclusion:** At the end of this study, there was indication of unhealthy behaviors in a population who still presented a good level of physical independence despite their clinical diagnosis and the predominant of exposition factors. The analysis of other factors, which predict health promotion behaviors, is imperative.

**Key words:** Lifestyle; Healthy behaviors; Functional dependence; Chronic obstructive pulmonary disease (COPD).

## RESUMEN:

**Objetivo:** Describir las conductas promotoras de salud y el grado de dependencia física en personas con diagnóstico de Enfermedad Pulmonar Obstructiva Crónica (EPOC).

**Metodología:** Estudio con enfoque cuantitativo, de alcance correlacional, en el que se obtuvo una muestra probabilística de 125 personas. Se aplicó la escala Estilo de Vida Promotor de Salud II (EVPSII) versión en español y el Índice de Barthel.

**Resultados:** El 68,8% de los participantes eran del sexo femenino. El diagnóstico más prevalente fue la EPOC no especificada 67,2%. Como factores de exposición se identificaron, el tabaquismo 35,2%, y este mismo factor combinado con la exposición al humo de biomasa en el 32,8%. En cuanto a las conductas promotoras de salud, se evidenciaron bajos promedios en las dimensiones relacionadas con actividad física y la nutrición; altos promedios en el crecimiento espiritual, tanto en hombres como en mujeres. El 92,8% de las personas eran independientes para las actividades básicas de la vida diaria. Se identificaron asociaciones estadísticamente significativas en algunas dimensiones del EVPSII con: los grupos de edad, la utilización de oxígeno suplementario y la exposición al humo de biomasa.

**Conclusión:** Se encontraron conductas poco saludables en una población que aún presentaba un buen nivel de independencia física a pesar de su diagnóstico clínico y de la prevalencia de factores de exposición. Es importante analizar otros factores que sean predictores de las conductas promotoras de salud.

**Palabras clave:** Estilo de vida; Conductas saludables; Dependencia funcional; Enfermedad pulmonar obstructiva crónica.

## INTRODUCTION

The chronic obstructive pulmonary disease (COPD) is categorized within a group of non-communicable diseases which cause consists mostly in the issues produced by the tobacco consumption <sup>(1)</sup> and for other factors of exposure (second-hand smoke, biomass smoke, history of pulmonary tuberculosis and occupational exposure) as possible promoters of this disease <sup>(2,3)</sup>. For the identification of the disease, a clinical diagnostic must be considered in any person with these exposure factors, as well as symptoms like dyspnea, chronic coughing, or sputum (phlegm) production.

At respiratory level, there is a persistent limitation of airflow, as a unique feature of this pathology (obstructive ventilatory alteration), that can be confirmed with a Spirometry <sup>(4)</sup>. At a systemic level, the COPD produces a gradual loss of physical independence, which impedes a person to perform many instrumental activities of daily living (IADLs) and basic activities, which make part of their daily living <sup>(5,6)</sup>. In addition to this, in advanced stages of the disease, the loss of functional capacity, generates a greater issue in the life of a person, due to the fact that the person must often face progressive symptoms and exacerbations, which requires a regular hospital care <sup>(7-9)</sup> and an increased demand of home care <sup>(10,11)</sup>.

In this sense, the progress of the disease is proportional to a bad prognosis and to the reduction of the quality of life <sup>(12-14)</sup>; and as a consequence, the more symptomatically compromised the person is, the less possibility to assume his condition of morbidity and to self-regulate his health. For these reasons, people suffering from COPD need support networks, which involve the patient's family and the assistance given from his nursing care institution. This aspect will help him to understand the process of his disease and to favor a health-promoting lifestyle (HPL) indispensable for the control of the exposition factors, the symptoms control, and for the improvement of his adherence to the pharmacological and non-pharmacological treatment. All these, with the purpose of promoting conducts for the patient's own care which endeavor for a

better quality of life, to the extent permitted by the developmental process of his disease<sup>(15,16)</sup>.

In this regard, It is important to offer the patient from his primary assistance, the possibility to be supported not only on his clinical matters but also on the support he needs for the identification of more benefits than barriers he might have perceived regarding his health maintenance. This assistance will allow the patient to have a certain commitment with an action plan that can modify his lifestyle and fosters an increased well-being.

In many occasions, the health promotion behaviors are not achieved because the person does not count with a persuadable support network, which helps him to undertake to change his lifestyle; in other cases, individual factors as poor prognosis could be the cause that interferes with his goals for recovery. In this regard, Nola Pender, in her Health Promotion Model (HPM), claims: "Persons are more likely to commit to and engage in health promotion behaviors when significant others model the behavior, expect the behavior to occur, and provide assistance and support to enable the behavior"<sup>(17)</sup>.

Based on the Pender model, the health can be affected by biological, psychological or sociocultural constraining factors, which predict certain conducts and that exert influence in the consideration of the goal for those conducts<sup>(18)</sup>. For the specific case of a person suffering from COPD the biological factors that can be mentioned are those related to his permanent symptomatology and the seriousness of his disease. As for psychological factors, the most important to be considered is the emotional state of the patient, which usually tends to show a depressive attitude caused by his reduced health condition and by his physical disability to perform the IADLs and the BADL, which generates social and family isolation<sup>(19,20)</sup>. As sociocultural factors, we can mention the exposure and behavioral factors in the patient's lifestyle that allows the cause or the progress of the disease. In addition to these constraints, the barriers perceived by the person which impede an appropriate self-management of care, besides the social and family influence that contribute to denying that the exposure factors are harmful, must also be taken into consideration.

In this regard, it is important to foster practices related to healthy lifestyles: physical activity, stress management, balanced diet and adherence to treatment, becoming on essential, encouraging influences that guarantee an action plan for each person, attaining a behavioral outcome which diminishes the progression of the disease and contributes to modify the conducts that can have a negative influence in the health process of the patient.

The aim of this study was to describe health promotion behaviors and the degree of physical dependence and its association with the socio-demographic and clinic characteristics in people with the chronic obstructive pulmonary disease (COPD) diagnosed.

## **MATERIAL AND METHODS**

Qualitative approach study of correlation-scope performed during 2015 at a Social State Company (SSC), which offers low complexity services in the city of Manizales, Colombia. The population was registered in a database, in which a COPD clinical diagnostic is requested. Initially, a pilot test with 43 people chosen randomly was carried out in order to estimate the homogeneity of the data obtained in the scale: A

health-promoting lifestyle Profile II (HPLPII) Spanish version. Considering the resulting average with this instrument, the decision taken was to work with a confidence index of 95%, a margin of error of 5% and a relative error of 3%, thus obtaining a random sample of 125 people from the database aforementioned. People with the following diagnoses were included: unspecified COPD, COPD with an acute infection and acute exacerbation of COPD. The population excluded from this study were the ones who were not able to respond the designed survey personally, due to physical or cognitive disabilities, people who declared themselves as illiterate or those who were not attending to a health care institution. The valued variables were the socio-demographic features, clinical features, health promotion behaviors and the degree of physical dependence.

### Data Collection

For the approach of the population and for the data mining, the intention of this study was explained individually and there was a proper motivation on the subject. Subsequently, an informed consent was read to the population with the purpose of obtaining their authorization to participate in the survey application voluntarily.

The sociodemographic and clinical data were obtained from the participants' medical record and from the interview performed with them.

To identify the health-promotion behaviors, the scale known as Nola Pender's health-promoting lifestyle II (HPLII) Spanish version was applied. To obtain data about the degree of physical dependence, The Barthel Index Scale was applied.

The HPLII scale has shown in its reliability study an internal consistency of 0,87<sup>(21)</sup>. At the level of the Latin America region, in Colombia as in Chile, this instrument has been used in studies with young and adult people assisted in health care services <sup>(22)</sup>. Similarly, there have been studies in which the scaled was applied to university students <sup>(23)</sup>, as well as on peri, post menopausal women <sup>(24)</sup> in whose reliability test reported alpha coefficient ranging from 0,70 to 0,87 respectively.

This instrument consists of 52 items with Likert answer options and of six sub-dimensions: health responsibility, physical activity, nutrition, spiritual growth, interpersonal relationships, and stress management. Each dimension consists of 8 to 9 items to which the person must answer the frequency with which the person performs activities presented in each item. The answer options and the score for each item are: Never (1), Sometimes (2), Often (3), and Always (4).

Regarding the Barthel Index Scale, it keeps being widely used in the last years in elder people with or without chronic disabling diseases <sup>(25-29)</sup>. Its application allows to identify the capacity a person has to perform the basic activities of daily living with or without help as eating, using the toilet, taking a shower, putting on his clothes and caring for themselves (basic self-care), wandering, moving from the chair to the bed, going up and down the stairs (mobility), bladder control and elimination (continence).

To identify the degree of physical dependence the following cut-off points have been taken as reference:  $\geq 85$  independent person, 60-80 mild dependence, 40-55 moderate dependence, 20-35 serious dependence and  $< 20$  total dependence.

## Analysis of the Information

Initially, the information obtained was processed by means of the statistics software IBM® SPSS® v. 22.

The starting point was a description of the sociodemographic and clinical variables through frequencies and central tendency measures.

To describe the health-promoting lifestyle, the HPLII scale global average was calculated, similarly, the average obtained for each dimension to do the analysis, taking into account that the sum of 208 points is interpreted as a healthy life style, being this amount little or no healthy at all for values below this range<sup>(30)</sup>.

The degree of physical dependence was reported according to the cut-off points established at the Barthel index.

To establish an association among the variables related to the socio-demographic aspects, the clinical aspects, the health-promoting lifestyle (health promotion behaviors) and the degree of physical dependence, a bi-variated analysis was performed.

## RESULTS

### Sociodemographic and Clinical Features

The greater percentage of the population consisted of women in 68,8%. 44% of the participants were in ages that could be defined as mature adults (35-59 years old) and the 56% of seniors (> 60 years old). The lowest age recorded was 42 years old and the highest was 95 years old, with an average of 67 years old. In the group of women, the highest age percentage reported (53,4%) was between 60-79 years old; and in the group of men, the highest percentage (41%) was between 70 and 79 years old.

The marital status of the participants is proportionally distributed among single people (25,6%), married people (22,4%) and widowers (24,8%). In a lower proportion, there is a prevalence of people who live under domestic partnership and the ones who are divorced. A greater percentage of people belong to the second social stratum (48%), followed by the ones who belong to the first stratum (36%). Regarding their level of schooling, there is a prevalence of primary school education (75%); in addition to this, there are people who expressed not having any academic background, nevertheless, they were able to read and write (11,2%).

Concerning the clinical characteristics of the participants, 67,2% presented a diagnostic of an unspecified COPD and the remaining 32.8% presented EPOC with acute exacerbation or infection. The tobacco use is the most prevailing exposure factor in both, men and women reporting a 35,2% of the sample. Similarly, this factor combined with biomass smoke exposure was detected in a 32,8% of the population, being more predominant in females. In a lower proportion, there were people who presented one or two factors combined as, the biomass smoke exposure 17,6%, second-hand smoke 3,2%, tobacco use and occupational exposure 2,4%, tobacco use and pulmonary tuberculosis 1,6%.



From the sample population who participated in the survey, 26 out of 28 people who used domiciliary oxygen, were oxygen requiring and 3 of them were oxygen dependent. The lowest time data for oxygen use was 2 hours and the highest of 24 hours, with an average of 9.9 hours per day.

### Health Promotion Behaviors

The Kolmogorov-Smirnov test applied to the results obtained on the scale HPLP II, show homogeneous data with a normal distribution. The analysis of reliability reports a Cronbach's alpha of 0,918.

The results obtained in the HPLP II showed a minimum global score of 82 points and a maximum score of 178 points, with an average of 127,9 points for men and 130,4 for women without meaningful differences by genre to be shown (Table 1).

When analyzing the data obtained in each of the scale dimensions, there is evidence of a high score in the dimension related to the spiritual growth, and the lowest score was observed in the dimensions related to physical activity and nutrition (Table 2).

**Table 1.** Global Dimensional Average obtained with the HPLP II scale differentiated by sex.

Health Promotion Behaviors (Mean)	Genre		P Value
	Male n=39	Female n=86	
Health Responsibility	22,18	23,19	0,275
Physical Activity	14,38	13,17	0,096
Nutrition	20,15	20,26	0,841
Spiritual Growth	26,03	28,09	0,062
Interpersonal Relationships	25,13	25,00	0,893
Stress Management	20,03	20,72	0,348
<b>Average HPLP II</b>	<b>127,9</b>	<b>130,43</b>	<b>0,494</b>

Source: elaborated by the author

**Table 2.** Descriptive table of the dimensions pertaining to the scale HPLP II of the participants of this study.

Health-Promotion Behaviors	N	Theoretical Mi/Max	Minimum	Maximum	Mean	Typ. Deviation	Variation Coeffic
Health Responsibilities	125	9/36	9	33	22,9	4,8	20,8
Physical Activity	125	8/32	8	28	13,6	3,8	27,8
Nutrition	125	9/36	13	28	20,2	2,6	13,0
Spiritual Growth	125	9/36	12	36	27,4	5,8	21,0
Interpersonal Relationships	125	9/36	13	34	25,0	4,9	19,7
Stress Management	125	8/32	11	31	20,5	3,8	18,7

Theoretical Mi/Max= possible minimum and maximum theoretical values in the HPLP II scale.

Source: elaborated by the author.

## Physical Dependence

In regard to the variable related to the degree or level of physical dependence obtained by means of the Barthel Index, the results show that 92,8% were independent for the performance of the IADLs. The minimum data obtained was 20 points and the maximum 100 points.

Concerning self-care basic activities, the results show that the best averages were obtained regarding the capacity to ingest food, get dressed, and go to the bathroom without any help. In contrast, the population with a higher degree of dependence in relation to self-care and activities as taking a shower, require help. Regarding the mobility, the best average observed was about the capacity people had to move without help from a chair to their bed and also to walk around. With regard to the use of stairs, there is evidence of lower scores, which indicates that a higher percentage of people needed some help. Finally, in relation to bladder control, the findings show that the average obtained was high for both, urination control and for defecation, showing that most of the population preserved their continence functions (Table 3).

**Table 3.** Study participants Barthel index descriptive table

Variable	Theoretical Mí/Max	Minimum	Maximum	Media
Feeding	0/10	5	10	10
Bathing	0/5	0	5	5
Clothing	0/10	0	10	10
Grooming	0/5	0	5	5
Toilet use	0/10	0	10	10
Chair-bed Translation	0/15	0	15	15
Stroll	0/15	0	15	14
Stairs	0/10	0	10	9
Urination	0/10	0	10	9
Bowel movement	0/10	5	10	10

*Theoretical Mí/Max= minimum and maximum possible theoretical values in the Barthel Index..*

*Source: elaborated by the author.*

When analyzing the existing associations among the health promoting behaviors (as a dependent variable) through a global score of the health-promoting lifestyle Profile II scale with the socio-demographic and clinical variables, there were statistically significant differences between them. Nevertheless, the analysis of health-promoting lifestyle profile questionnaire which presented the same variables, showed significant differences regarding age group (mature adults and elderly adults), the nutrition dimension ( $p= 0,038$ ), and the stress management ( $p= 0,048$ ); the use of supplementary oxygen, and the dimension of physical activity (O<sub>2</sub> requiring patient  $p= 0,011$  – O<sub>2</sub> dependent patient  $p= 0,037$ ); the exposure to biomass smoke with the dimensions of responsibility and health ( $p= 0,0251$ ); spiritual growth ( $p= 0,0002$ ), interpersonal relationships ( $p= 0,0113$ ), and stress management ( $p= 0,0127$ ) (Table 4). Regarding the physical dependence, there were only statistically significant differences in this variable between this variable with the use of oxygen ( $p= 0,000$ ).

**Table 4.** Health-promoting lifestyle Profile II scale dimensions and their association with the sociodemographic and clinical characteristics.

Variable	Health-promoting lifestyle Profile II scale dimensions (p Value)					
	Health Responsibility	Physical Activity	Nutrition	Spiritual Growth	Interpersonal Relationships	Stress Management
Age Groups	0,194	0,662	0,038**	0,129	0,160	0,048**
O2 Requiring patient	0,495	0,011**	0,289	0,254	0,602	0,372
O2 Dependent patient	0,474	0,037**	0,662	0,875	0,852	0,197
Biomass smoke Exposure	0,0251**	0,4191	0,7707	0,0002**	0,0113**	0,0127**

*P Significant value= < 0,05\*\**

## DISCUSSION

The first significant finding of this study is the fact of having found a sample of people suffering from COPD in which women are predominant, therefore, this aspect must be considered due to the fact that the epidemiological reports have always shown higher prevalence rates in men<sup>(31)</sup>. Consequently, it is important to highlight the fact that although many of the participants of this study do not count with a confirmed diagnostic done through a spirometry, the factors of exposure in all participants accomplish a description of the clinical features that this diagnostic brings into consideration. Nonetheless, this study demonstrated an interaction between the clinical diagnostic and the exposure factors, which could indicate a clinical overvaluation of the population; in addition to this, the records where the initial information of these people is extracted, report as the prevailing diagnostic the unspecified COPD, demonstrating in this case, the lack of confirmation of a diagnostic. Furthermore, people's unawareness of their disease is identified, when they are being addressed in order to collect the information. These findings are consistent with the public health issues known worldwide, where it is epidemiologically shown that the COPD is characterized by a high degree of infra diagnosis, predominant in people aged between 40-80 years old<sup>(32)</sup>.

Another important aspect of this study is the fact of finding exposure to biomass smoke, tobacco use, and passive exposure due to second-hand tobacco use, on the female population. This aspect should be assumed as a relevant fact, considering that at the moment, the causes of the COPD are determined as multifactorial, including genetic factors as well as environmental factors. Specifically for the biomass combustion, current literature reports that the smoke it produces contains more than 250 organic compounds that generate a high level of environmental contamination and particles of matter that can be absorbed through the air, triggering the oxidative stress, which constitutes a risk factor not only for the COPD but also for other types of respiratory diseases. It has been reported that the vulnerable population for this type of exposure predominate in rural areas and on the sociocultural aspect, women and children are more exposed to the biomass smoke because their common activity is related to domestic tasks, in particular, the task of daily firewood cooking<sup>(33)</sup>. The described characteristics coincide with the ones reported in this study, where most of the women are housewives who mention having been exposed to the biomass smoke for long periods of time and also for the evidence of statistically significant differences



among some of the dimensions of the health promoting lifestyle and the factor of exposure to the biomass smoke.

Regarding the health promotion behaviors exists a similar behavior in the average obtained in both men and women, and there is no significant differences by genre. Similarly, there is evidence that both coincide on low scores in the dimension related to physical activity and nutrition; and high scores in the dimension related to the spiritual growth. These results show the reduction of health promoting behaviors in a population in which mature adults and elderly adults are predominant, and most of them belong to low social stratum, with a schooling level of primary school and a high level of unemployment who despite this condition, present independence to perform the activities of daily living (ADL). Nevertheless, when looking for an association of these variables with people's health-promoting lifestyle, there are no statistically significant differences. These data coincide with the ones reported by Patricia Cid<sup>(34)</sup> et al, who evaluated the psychological, biological factors that predict the health promotion lifestyle in a population with people between 15–64 years old, with no evidence of an association between these variables.

As contrasting data, the study of Vidal Gutiérrez<sup>(35)</sup> is taken into consideration. Vidal Gutierrez, who found a significant association within the health-promoting lifestyle with structural determinants as the place of residence, age, sex, the level of education and incomes in an adult population between 20-65 years old who attend to health care centers, while evaluating the existent relationship between the social health determinants and the health-promoting lifestyle. The study made by Vidal Gutiérrez explores associations regarding gender and emphasizing on the significant differences found between men and women in the dimensions related to physical activity, stress management, and spiritual growth. Whereas this study shows that the average in the dimension of physical activity was equally low in both men and women, there is a report of high scores regarding the dimension of spirituality for both genres.

Finally, as highlighted aspects from this study are considered, the significant differences in people who use oxygen (oxygen requiring or oxygen dependent), their physical dependence and the dimension related to physical activity. With regard to the performance of basic activities of daily life, the lowest score reported concerning mobility, has to do specifically with the use of stairs as the most difficult activity to be performed by these people. These findings coincide with the characteristics reported in different studies concerning people suffering COPD<sup>(36,37)</sup>, in which case, as the disease progresses, there is a significant functional capacity loss, which leads to avoiding conducts that generate physical effort, which constrains them to perform only the basic activities of their daily life. In this regard, it can be assumed that the functional capacity loss in people suffering COPD generates in patients the need to cease behaviors that impede them from maintaining their good health condition as in the case of physical activity.

## CONCLUSION

The population found with a COPD clinical diagnostic, considering the exposure factors that develop this condition, has the need to confirm this disease by taking a spirometry test. Regarding the variables analyzed, it can be inferred that there is a prevalence of unhealthy behaviors in a population, which still shows a good level of physical independence despite their clinical condition. For this reason, the analysis of other factors that predict the health-promoting behaviors becomes an essential action.

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