

The Effect of Motivational Interviewing on the Life Expectancy of Patients with Chronic Obstructive Pulmonary Disease

Hamid Naderloo,¹ Zohre Vafadar,² Alireza Eslaminejad,³ and Abbas Ebadi^{4,*}

¹Student of Critical Care Nursing, Faculty of Nursing, Baqiyatallah University of Medical Sciences, Tehran, IR Iran

²Assistant Professor, Faculty of Nursing, Baqiyatallah University of Medical Sciences, Tehran, IR Iran

³Assistant Professor of Pulmonary Disease, Chronic Respiratory Diseases Research Center, National Research Institute of Tuberculosis and Lung Diseases (NRITLD), Shahid Beheshti University of Medical Sciences, Tehran, IR Iran

⁴Behavioral Sciences Research Center, Faculty of Nursing, Baqiyatallah University of Medical Sciences, Tehran, IR Iran

*Corresponding author: Abbas Ebadi, Associate Professor of Behavioral Sciences Research Center, Faculty of Nursing, Baqiyatallah University of Medical Sciences, 6th Floor, Tehran, IR Iran. Tel: +98-9122149019, Fax: +98-2182483443, E-mail: ebadi347@bmsu.ac.ir

Received 2017 January 20; Accepted 2017 February 12.

Abstract

Background: Low life expectancy is one of the common problems among patients with chronic obstructive pulmonary disease (COPD).

Objectives: Thus, the present study aimed at evaluating the effect of motivational interviewing (MI) on the life expectancy of these patients.

Methods: After repeatedly subjecting 54 patients to several evaluation techniques in a two-group clinical trial, both MI and lifestyle training were conducted for the 27 individuals in the experimental group receiving the intervention, while only lifestyle training was provided for the 27 individuals in the comparison group. The adult hope scale (AHS) questionnaire was checked 1 and 2 months later.

Results: Life expectancy was meaningless in both groups before the intervention. However, according to the evaluations during the 1 month and 2 months follow up, the average point of life expectancy increased in the intervention group ($P = 0.002$ and $P = 0.008$, respectively).

Conclusions: Performing the MI approach could increase life expectancy in patients with COPD.

Keywords: Life Expectancy, Motivational Interviewing, Chronic Obstructive Pulmonary Disease

1. Background

Pulmonary diseases have become one of the most important causes of illness and death worldwide (1). Chronic obstructive pulmonary disease (COPD) is one of the most common chronic lung diseases. In addition, according to the Global initiative of chronic obstructive lung disease (Gold), this disease will go from being the sixth most widespread cause of death worldwide to being the third by 2020, and will be the fifth most disabling disease (2). Since 2010, COPD has led to 2.1 trillion dollars in economic costs throughout the world, half of which is in developing countries. Of this amount, 1.9 trillion dollars are direct costs like healthcare, whereas indirect costs like job losses only account for 0.2 trillion dollars of the whole amount, which is expected to rise up to 4.8 trillion dollars in 2030 (3). Patients suffering from this disease incurred the most consumer expenditure, making up 51% of the figures mentioned above which were related to the aggravation of their disease (4). Unfortunately, due to the physiology of this disease, regardless of adherence to treatment and other variables, the disease keeps growing day-by-day,

making the affected person weaker than before.

Given the progressive and chronic development of lung dysfunction caused by the disease and the aggravation of the respiratory symptoms, these patients experience the gradual decline of their health status over the years. Moreover, their social life, physical performance, and daily activities are frequently disturbed and they may even start relying on others, especially their family members to satisfy their own personal needs (5). As a result of all these problems, patients become deeply affected by the decline or loss of their social roles and by various psychological problems like fear, depression, seclusion, dependence on others, and anxiety, all of which eventually lead to reduction of quality of life and life expectancy.

Expectancy is a complicated, multidimensional, and potentially powerful factor in improvement and compatibility, which helps the patient to cope with the disease crises both physiologically and emotionally; increased expectancy increases the quality of life of the patients (6).

Life expectancy has been defined as an internal force that helps life enrichment and enables the patients to see beyond the current poor status of their pain and suffering.

Low life expectancy and the absence of a purpose in life diminish life quality and give rise to disheartening beliefs (7).

Those suffering from a chronic disease have different physiological, psychological, and emotional needs; and satisfying these kinds of needs is considered a part of the treatment process. Therefore, whether the patients' recovery or satisfying their needs are considered, the most useful option is to conduct a type of interventions that considers psychological treatments in addition to physical treatments (8).

To date, several ways of increasing life expectancy have been proposed throughout the world. Each model and theory only focuses on a certain part of human's psychological aspects. COPD is among chronic diseases and stays with the person for the rest of his/her life. Thus, to raise the level of life expectancy, we need a model and a pattern to encourage the person to fight the disease and lead his health behaviors to become institutionalized and motivate him to continue the treatment process so that his life expectancy could increase as well. This feature is much stronger and more outstanding in MI compared to other models (9).

To increase the patient's motivation, a method called MI was proposed by Miller back in 1983 to be used as a preliminary treatment to increase motivation for further treatments. MI is a collaborative personalized type of guidance aimed to encourage and strengthen motivation to change. MI places great emphasis on principles like sympathy and expression of the patients' internal conflicts, and uses consulting techniques such as asking open-ended questions, reflective listening, summarization, and making conversation about change to evoke intrinsic motivation (10).

The use of this method has helped the clinical trials to yield positive results in weight loss among fat or overweight individuals (11), lifestyle changes in patients with high blood pressure (12), self-care in oral hygiene (13), adherence to medication in patients suffering from transient ischemic attack (14), adherence to therapy among sufferers of cystic fibrosis (15), and treatment and prevention of HIV infection (16).

Because the efficiency of this model and life expectancy among patients with COPD have not been evaluated yet, this research was conducted with to study the effects of MI on the life expectancy of COPD patients.

2. Objectives

The current study aimed at evaluating the effects of MI on the hope of life among COPD patients.

3. Methods

This was a two-group clinical trial with repeated measures conducted during February 2016 and October 2016 with the aim of evaluating the effects of the independent variable (MI) on the dependent variable (life expectancy) among patients with COPD.

The population included the patients with COPD residing in Tehran province who were hospitalized in the city of Tehran's Dr. Massih Daneshvari hospital.

The inclusion criteria of the study are as follow: confirmation of the disease by a physician; maximum age of 65 years; lack of any other underlying diseases like diabetes or a stroke; the person's availability and the possibility of an 8-week follow up; lack of any history of a psychological diseases and Alzheimer's disease, and literacy at least enough to fill out the questionnaire. The exclusion criteria were the person's affection of any other disabling physical and psychological diseases in the course of the study; and the patient's unresponsiveness in checkups within 1 and 2 months.

In the present study, to estimate the sample size using the Altman nomogram with a statistical power of 0.9 and a significance level of 0.05 and the calculated standard deviation from the study of Karimi Moonaghi et al. (17), the sample size for each group was estimated to be 27. However, considering the 10% drop out rate, the sample size was estimated to be 30 individuals in each group. These patients were divided into intervention and comparison groups by forming the fourfold blocks using a randomized block design.

The tools used for data collection are as follow:

- The Demographic questionnaire gathered data on age, sex, marital status, having insurance, level of financial satisfaction, level of tobacco consumption (pack per year), education, duration and severity of illness, place of residence, and readmission in the past year.

- The Snyder's life expectancy (adult hope scale (AHS) questionnaire): This questionnaire was designed and evaluated by Snyder et al. in 1991. This 12-item questionnaire has a grading method based on a 5-point Likert scale such that the higher the grade, the more the life expectancy (18). The study of Kermani et al. has reported the reliability of the Persian version of this questionnaire to be 0.86 by Cronbach's alpha formula and 0.81 through retesting (19).

After identifying the research samples in the wards, and asking the participants to fill out the informed consent form and the demographic information questionnaire, the pre-examination with the AHS questionnaire was conducted. Then, the samples were divided into a comparison group and an intervention group using random allocation method (fourfold blocks).

In the comparison group, 2 training sessions on lifestyle and consumption of the drugs, each lasting 15 to 45 minutes, were conducted in 1 session based on the patient's need and endurance. One and 2 months later, the patients repeatedly filled out the questionnaires. Meanwhile, several phone calls were made to each person to both address the questions and evaluate the patient to find whether he/she would fit the exclusion criteria.

Moreover, in the intervention group, 5 sessions of MI, each lasting 15 to 45 minutes, were provided to the individuals by the researcher as frequent as 2 sessions a day at the hospital based on the patients' endurance. Then, the researcher provided 2 sessions on lifestyle, consumption of the drugs, and training, which lasted 15 to 45 minutes (The points mentioned about the disease had been confirmed by a pulmonologist and was the same in the comparison and the intervention groups.). Then, the patients repeatedly filled out the questionnaire 1 and 2 months later. Meanwhile, several phone calls were made to each person to both address the questions and evaluate the patient to find whether he/she would fit the exclusion criteria.

The structure and content of the MI sessions were based on the book called MI by William R. Miller, and the interviewing sessions were confirmed by the related specialist in a recorded pilot sample.

The purpose of the first part of MI was to acquaint references with MI and prepare them. The second part helped the patients to move away from the urgency and the sensation of external need and move towards the inner desire to change. The third part focused on the references' ambivalence, the good things, and the things that are not very good about the behavior. The purpose of the fourth part was to evoke an inner desire to change, enhance, and reinforce the process of desiring change and clarification, and to identify, verify, and authenticate reference values. Finally, in the fifth part, the recognition of tempting situations and conclusion were considered.

To implement the ethical considerations, the aims of the study was explained to the participants and they were informed that their participation was voluntary, moreover, they were assured that the private matters pertaining to their medical records and the rest of their information would be kept confidential, and that they could leave the project any time.

This study obtained a license granted by the ethics committee of Baqiyatallah University of Medical Sciences, (IR.BMSU.REC 1394, 220; January 11, 2016).

Data were analyzed using the 22nd version of the SPSS software. Statistical tests included descriptive statistics such as the mean and standard deviation. Moreover, frequency and inferential statistics such as the One-Sample

Kolmogorov-Smirnov test were used to check the normality of the distribution of the quantitative data. Chi-squared test was used to check the homogeneity of the qualitative demographic variables in the 2 groups. Independent t test was used to check the homogeneity of the quantitative demographic variables and to compare the life expectancy grades at each stage in both groups. In addition, the repeated measures analysis of variance (ANOVA) was used to check the changes of life expectancy grades over time in the 2 groups.

4. Results

The results of the present study revealed that the average age was 53.07 years in the intervention and 55.04 years in the comparison groups, respectively. Duration of illness, readmission, and the level of tobacco consumption (pack per year) were 9.07 and 9.52, 2.37 and 1.93, and 10.5 and 15.14 in the intervention and the comparison groups, respectively (Tables 1 and 2).

The above above demonstrates that the pre-examination did not have a meaningful difference between the two groups, and the difference was meaningful in the first and second follow-ups ($P < 0.05$). The repeated measures analysis of variance showed that the changing process of grades between the two groups was meaningful in favor of the intervention group ($P = 0.004$) (Figure 1).

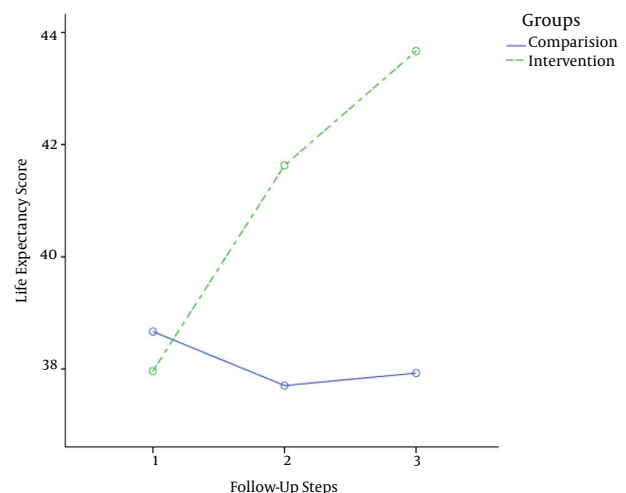


Figure 1. Comparison of the Changing Process of Life Expectancy Between the Two Groups

5. Discussion

The present study was conducted assuming that MI increases life expectancy in patients with COPD. The find-

Table 1. Comparison of the Frequency of the Qualitative Variables Between the Two Groups

Group Characteristics		Intervention	Comparison	P Value	Statistical Test
Gender	Male	14 (51.9)	17 (63)	P = 0.58	Fisher exact
	Female	13 (48.1)	10 (37)		
Educational level	Primary	9 (33.3)	17 (63)	P = 0.08	Chi-square
	Below high school diploma	9 (33.3)	6 (22.2)		
	high school diploma	9 (33.3)	4 (14.8)		
Severity of the disease	Mild	2 (7.4)	4 (14.8)	P = 0.91	Fisher exact
	Moderate	2 (7.4)	2 (7.4)		
	Severe	8 (29.6)	8 (29.6)		
	Very severe	15 (55.6)	13 (48.1)		

Table 2. Comparison of the Frequency of the Changing Process of Life Expectancy Between the Two Groups^a

Group Characteristics		Intervention	Comparison	T Test
Life expectancy	Pretest	37.96 (5.6)	38.67 (5.6)	0.652
	Posttest 1	41.63 (4.9)	37.7 (5.4)	0.008
	Posttest 2	43.67 (7.5)	37.93 (5)	0.002
Repeated measures analysis of variance		P = 0.004	P = 0.004	P = 0.004

^aValues are expressed as mean (SD).

ings revealed that the average point of life expectancy did not have a meaningful statistical difference between the 2 groups at the pre-exam stage, but the difference was meaningful after the first and second exams.

Hamryn et al. in 2016, conducted a study titled "Evaluation of motivational interviewing to improve psychotropic medication adherence in adolescents", in which MI was performed by 4 clinical nurses and 2 senior adolescent psychologists. They reported that this method improved the adherence to medication (20). To show the effects of MI on adherence to treatment, we referred back to the systematic review and meta-analysis articles written in 2016, - after considering the literature from the years 1966 to 2015-, which reported MI to be meaningful and effective in increasing adherence to treatment (9).

While many sources indicate the effectiveness of MI, some researchers have reported a different result: for example, Stenman et al. consider this method weak and ineffectual in their study. In their study, the group receiving the MI did not demonstrate a meaningful statistical difference in degenerative bleeding and platelets compared to the control group even though MI had been lessened in the group (21). However, this might have been due to the fact that the interview was conducted only in one session lasting approximately 44 minutes.

Another research reported the effectiveness of telephone-based MI on adherence to treatment (22). In a study titled "The impact of life skills training on happiness and hopefulness among patients with type 2 diabetes in 2015", Shirkavand et al. used the AHS questionnaire and reported meaningful results gained from using the method of life skills training to raise the level of happiness and hope in patients suffering from Type 2 diabetes (23).

Hojjati et al. conducted a study titled "Comparing Two methods of pray and mentioning on life expectancy in patients hospitalized in ccu ward of the social security Golestan hospitals in 2015". In their study, they used the AHS questionnaire (similar to the questionnaire used by the researcher) recommending the consideration of spiritual care as a guide alongside other forms of care (24).

As demonstrated in Table 2 and Figure 1, life expectancy has been on the decrease in the comparison group in the first and second follow-ups despite the 2 sessions of lifestyle training. This could be justified by stating that Dr. Massih Daneshvari hospital is a university hospital, and these patients have been subjected to lifestyle and drug use training by the student nurses and the medical students, or has received effective cough training and chest physiotherapy by the physiotherapy students time and time again. Thus, they might have already grown indifferent to

such repetitive trainings. Therefore, we needed a method by which the person would have wanted to follow-up with the treatments, moreover, by performing the MI method, the person's tendency to undergo treatment in the best way possible would be fostered as would life expectancy as a result.

With a brief look at the results, one would conclude that using MI method helps raise the life expectancy among patients with COPD.

The main problem of conducting this research was the limited selection of the patients hospitalized in the ward. Thus, It is recommended that matters such as life expectancy, readmission, and life quality be followed within a much longer time.

Acknowledgments

We hereby express our appreciation to all the participants as well as the staff members of the wards 3, 4, and 9 of Dr. Massih Daneshvari hospital for their cooperation.

Footnotes

Authors' Contribution: None declared.

Financial Disclosure: None declared.

References

- Ries AL, Kaplan RM, Myers R, Prewitt LM. Maintenance after pulmonary rehabilitation in chronic lung disease: a randomized trial. *Am J Respir Crit Care Med*. 2003;167(6):880-8. doi: 10.1164/rccm.200204-318OC. [PubMed: 12505859].
- Marc Decramer M, Chair Jorgen Vestbo M, Vice C. Global Strategy for the Diagnosis, Management, and Prevention of Chronic Obstructive Pulmonary Disease. Global Initiative for Chronic Obstructive Lung Disease; 2013.
- Bloom DE, Cafiero ET, Jane-Llopis E, Abrahams-Gessel S, Bloom LR, Fathima S, et al. The Global Economic Burden of Non-communicable Diseases. World Economic Forum; 2011.
- Saleh A, Lopez-Campos JL, Hartl S, Pozo-Rodriguez F, Roberts CM, European CAT. The Effect of Incidental Consolidation on Management and Outcomes in COPD Exacerbations: Data from the European COPD Audit. *PLoS One*. 2015;10(7):e0134004. doi: 10.1371/journal.pone.0134004. [PubMed: 26214175].
- Salik Y, Ozalevli S, Cimrin AH. Cognitive function and its effects on the quality of life status in the patients with chronic obstructive pulmonary disease (COPD). *Arch Gerontol Geriatr*. 2007;45(3):273-80. doi: 10.1016/j.archger.2006.12.002. [PubMed: 17343931].
- Zhang LL, Gong J, Liu CT. Vitamin D with asthma and COPD: not a false hope? A systematic review and meta-analysis. *Genet Mol Res*. 2014;13(3):7607-16. doi: 10.4238/2014.February.13.10. [PubMed: 24615096].
- JCA. Health Psychology. ;2007. pp. 103-5.
- A K. Positive psychology: science of happiness and human's capabilities. Tehran: Sokhan; 2008.
- Palacio A, Garay D, Langer B, Taylor J, Wood BA, Tamariz L. Motivational Interviewing Improves Medication Adherence: a Systematic Review and Meta-analysis. *J Gen Intern Med*. 2016;31(8):929-40. doi: 10.1007/s11606-016-3685-3. [PubMed: 27160414].
- Miller WR. Motivational Interviewing with Problem Drinkers. *Behav Psychother*. 2009;11(02):147. doi: 10.1017/s0141347300006583.
- Navidian A, Abedi MR, Baghban I, Fatehizade MS, Poursharifi H. Effect of motivational interviewing on the weight self-efficacy lifestyle in men suffering from overweight and obesity. *Int J Behav Sci*. 2010;4(2):149-54.
- Navidian A, Abedi MR, Baghban I, Fatehizadeh M, Poorsharifi H. The effects of motivational interviewing on lifestyle modifications of clients suffering from hypertension. *Razi J Med Sci*. 2010;17(71):79-94.
- Mohammadi ZI, Yekaninejad MS, Akaberi A, Pakpour A. The effectiveness of Motivational interviewing (MI) of oral self care behaviors among high school students in Qazvin. *J North Khorasan Univ Med Sci*. 2013;5(1):127-37.
- Hedegaard U, Kjeldsen LJ, Pottegard A, Bak S, Hallas J. Multifaceted intervention including motivational interviewing to support medication adherence after stroke/transient ischemic attack: a randomized trial. *Cerebrovasc Dis Extra*. 2014;4(3):221-34. doi: 10.1159/000369380. [PubMed: 25598772].
- Duff AJ, Latchford GJ. Motivational interviewing for adherence problems in cystic fibrosis; evaluation of training healthcare professionals. *J Clin Med Res*. 2013;5(6):475-80. doi: 10.4021/jocmri603w. [PubMed: 24171060].
- Rollnick S, Miller WR, Butler CC, Aloia MS. Motivational interviewing in health care: helping patients change behavior. Taylor & Francis; 2008.
- Karimi Moonaghi H, Hasanzadeh F, Shamsoddini S, Emami-moghadam Z, Ebrahimzadeh S. A comparison of face to face and video-based education on attitude related to diet and fluids: Adherence in hemodialysis patients. *Iran J Nurs Midwifery Res*. 2012;17(5):360-4. [PubMed: 23853648].
- Snyder CR, Harris C, Anderson JR, Holleran SA, Irving LM, Sigmon ST, et al. The will and the ways: development and validation of an individual-differences measure of hope. *J Pers Soc Psychol*. 1991;60(4):570-85. [PubMed: 2037968].
- Kermani Z, Khodapanahi M, Heidari M. psychometrics features of the Snyder Hope Scale. *J Appl Psychol*. 2011.
- Hamrin V, Iennaco JD. Evaluation of Motivational Interviewing to Improve Psychotropic Medication Adherence in Adolescents. *J Child Adolesc Psychopharmacol*. 2016 doi: 10.1089/cap.2015.0187. [PubMed: 27487472].
- Stenman J, Lundgren J, Wennstrom JL, Ericsson JS, Abrahamsson KH. A single session of motivational interviewing as an additive means to improve adherence in periodontal infection control: a randomized controlled trial. *J Clin Periodontol*. 2012;39(10):947-54. doi: 10.1111/j.1600-051X.2012.01926.x. [PubMed: 22845421].
- Teeter BS, Kavookjian J. Telephone-based motivational interviewing for medication adherence: a systematic review. *Transl Behav Med*. 2014;4(4):372-81. doi: 10.1007/s13142-014-0270-3. [PubMed: 25584086].
- Shirkavand N, Gholami HS, Arab SZ, Ashoori J. The impact of life skills training on happiness and hopefulness among patients with type ii diabetes. *J Diabetes Nurs*. 2015;3(3):8-19.
- Hojjati H. Compare two methods of pray and mentioning on life expectancy i patients hospitalization in CCU Ward Social Security Golestan Hospitals in 1393. *Complement Med J Faculty Nurs Midwifery*. 2016;6(1):1384-94.