

## Original Article

## Evaluation of Complementary and Alternative Medicine Practices Use in Patients with Chronic Obstructive Pulmonary Disease: Assessment of Beliefs and Medication Adherence

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### Abstract

**Background:** Despite current developments in pharmacological treatments, complementary and alternative medicine practices have been widely used in patients with Chronic Obstructive Pulmonary Disease (COPD). It should be known why and for what purpose complementary and alternative medicine applications, which are accepted by a large part of the society, are used. The aim of this study was to evaluate the use of complementary and alternative medicine (CAM) practices in patients with COPD and factors affecting this condition.

**Methods:** This study designed as a descriptive study research was conducted in 244 patients with COPD. Data were collected using the Beliefs about Medicines Questionnaire [BMQ-Turkish Translation (BMQ-T)] and Morisky Green Levine Medication Adherence Scale (MGLS).

**Results:** It was found that patients with higher scores on the Specific Necessity Subscales of the BMQ-T Scale ( $\beta=0.420$ ,  $p=.03$ ), being unemployed ( $\beta=1.234$ ,  $p=.01$ ), having less income than expenses ( $\beta=1.511$ ,  $p=.02$ ) and having frequent exacerbations in the last year ( $\beta=0.367$ ,  $p=.02$ ) affected the use of CAM according to multivariate regression analysis.

**Conclusion:** It was revealed that having the belief in the necessity of medications, being unemployed, having less income than expenses, and having frequent COPD exacerbations were the most influential factors affecting the use of CAM.

**Keywords:** COPD; Complementary and Alternative Medicine; Belief; Adherence; Treatment; Nursing.

### Introduction

Chronic Obstructive Pulmonary Disease (COPD) involves progressive deterioration of lung function which is characterized by airflow limitation that is not fully reversible. Morbidity and mortality associated with COPD is increasing and it is the third leading cause of death worldwide (Singh et al., 2019).

Over 80% of these deaths occurred in low, and middle-income countries (World Health Organization, 2020). In Turkey, deaths from respiratory diseases are the third leading cause of deaths, and 45.6% of these deaths stem from COPD (Turkish Statistical Institute, 2020).

Complementary and Alternative Medicine (CAM) is defined as “a group of diverse medical health care systems, practices, and products that are not presently considered to be part of conventional medicine” (National Center for Complementary and Integrative Health, 2012). Despite recent advances in pharmacologic treatments, CAM treatments are widely used in patients with COPD (Arguder et al., 2019). In addition to cultural, educational, social, religious, and economic reasons for the widespread use of CAM treatments, a wide range of factors may play a role. Examples of these are cure by end-stage patients and the preference for herbal medicines over chemical medicines (Akan et al., 2012; Elolemy & Al Bedah, 2019).

Compliance with medication use is extremely significant in patients with COPD who have to use bronchodilators for a long period of time. As compliance with medication treatment decreases, exacerbations and accompanying hospitalizations increase (Shrestha et al., 2015). In order to ensure treatment compliance in patients with COPD, it is necessary to clarify the side effects and long-term effects of medications, as well as the beliefs and concerns of patients regarding medications (Falci & Shi, 2016). It has been observed that patients with high beliefs about the necessity of medication and low concerns about medication have higher compliance (Park et al., 2018). Ignoring CAM practices, which are also accepted by a large part of society, would jeopardize rather than protect public health.

Therefore, it is important to know which CAM practices are used in the community to what extent and for what purpose, compliance and belief in drug treatments, and the factors affecting them. In addition, it has been reported that studies investigating the effect of patients with COPD's beliefs about treatment on medication adherence are limited in the literature (Shahin et al., 2020). The aim of this study was to evaluate the use of traditional and complementary medicine in patients with COPD and factors affecting this condition.

## Methods

**Study Design, Sample, and Setting:** This study designed as a descriptive study research was conducted in patients with COPD who applied to Chest Diseases Clinic and

Polyclinic of Gulhane Training and Research Hospital (Ankara) between April 2018 with March 2019. According to the information received from the hospital, it is known that the chest diseases unit in the last year had 665 applications. The sample size was calculated with the formula determined by Salant and Dillman (1994). By using the sample formula, at the 95% confidence interval, with a sampling error of  $\pm 5\%$ , the required sample size for this population, which is not homogeneous, was calculated as  $n = 665 (1.96)^2 (0.5) (0.5) / (0.5)^2 (665 - 1) + (1.96)^2 (0.5) (0.5) = 244$ . The included criteria of the participants were fluent in speaking and writing Turkish, were 18 years or older and diagnosed with COPD. These COPD patients were categorized as stage 1, 2, 3 and 4, according to the current COPD GOLD Guideline (Singh et al., 2019). The participants having concurrent diagnoses of asthma, chronic respiratory disease, dementia, or any condition profoundly affecting cognition (including advanced cases of Parkinson's disease, stroke, or schizophrenia) were excluded. The COPD patients were categorized as CAM user, and non-CAM user according to the CAM use. Consequently, a total of 244 participants with COPD were enrolled in the study.

**Data Collection and Procedure:** The study was conducted in the chest diseases clinic and polyclinic. Interviews were held with participants who voluntarily agreed to participate in the study. The researchers took the volunteers consent before conducting their research on patients with COPD. During this interview, the participants were informed about forms and they were asked to fill out the questionnaires. The entire process took 15 to 20 minutes. The participant assessment form, Morisky-Green-Levine Medication Adherence Scale (MGLS), and Beliefs about Medicines Questionnaire (BMQ-Turkish Translation (BMQ-T) forms were used in this study.

**Participant Assessment Forms:** It includes sociodemographic characteristics of individuals and their opinions about and use of CAM by participants. It consists of 17 questions prepared by the researchers in accordance with the literature. In addition to these methods defined in the regulation on traditional, and complementary medicine practices, the questionnaire also included

practices that are considered to be frequently used in Turkey. Morisky-Green-Levine Medication Adherence Scale (MGLS): This 4-item dichotomous scale was developed by Morisky et al (1986). It was made to determine the adherence of patients to medication regimens (Morisky et al., 1986). The reliability and validity in the Turkish population were realized by Bahar et al. (2014). Each item asks patients whether they exhibit a specific type of non-adherent behaviour. For each item a yes, or no response is assigned a score of 1 or 0 respectively. The score of the MGLS can range from 0 to 4, and higher scores indicate lower adherence to medication. In this study, participants are categorized in two different groups according to their scores: 0=adherent; 1,2,3,4=nonadherent (Khanderia et al., 2008). Beliefs About Medicines Questionnaire (BMQ): This scale was validated for the Turkish population [BMQ Turkish Translation (BMQ-T)] by Cinar et al. (2016) and is used to assess patients' perceptions and expectations about medications. The original BMQ was developed by Horne et al. (1999). It consists of general and specific sections, with two subscales for each. The subscales of the BMQ-General section are General Harm and General Overuse, both consisting of four items. The General Harm subscale assesses patients' beliefs about the degree to which drugs are perceived as essentially harmful, while the General Overuse subscale addresses views on how drugs are used by physicians. The BMQ-Specific consists of two subscales, Specific Necessity and Specific Concern. These subscales have five items each that assess patients' beliefs about the necessity of prescribed medication for controlling their disease, and their concerns about the potential adverse consequences of taking it. The higher scores of each section indicate stronger belief in the concept of that section.

**Data Analysis:** Statistical analysis was performed using the IBM Statistical Package for Social Sciences, Statistics for Windows, Version 24.0 (IBM Corp.; Armonk, NY, USA, Released 2016). Participants were categorized as CAM use, or not CAM use patients. Continuous variables were expressed as mean  $\pm$  standard deviation (SD) (if normally distributed), median [Interquartile Range (IQR) (Q1-Q3)], (if not normally distributed), and categorical variables were

expressed as numbers and percentages. The compatibility of the continuous data with a normal distribution was examined using the Shapiro-Wilk Test. Comparisons between the groups were assessed using the Independent Samples T test, Mann-Whitney U test, and Pearson's Chi-Square Test. To evaluate potential risk factors for non-adherence binary logistic regression method was used. For all the analysis, a p value of less than 0.05 was considered to be statistically significant.

**Ethical Considerations:** This study was approved by the Institutional Review Board (IRB) of the University (Session No:2018/124). All of the participants in the study provided written informed consent in accordance with the principles of the Declaration of Helsinki. Participants were provided with information about the objective of the study, privacy, and confidentiality.

## Results

It was revealed that 73.4 % of the 244 patients who participated in the study used at least one of the CAM methods. The mean age of the patients was  $65.95 \pm 10.76$  years, and 82.8% of them were male, and 35.2% of them were stage 2 COPD. Statistically significant differences were found between the participants CAM-user and non-CAM user in the terms of male gender ( $p < 0.008$ ), not working ( $p < 0.009$ ), having frequent exacerbations in the last year ( $p < 0.009$ ), having frequent hospitalizations in the last year ( $p < 0.005$ ), and patients with lower income than expenses ( $p < 0.005$ ). A comparison of the participants according to the sociodemographic and, disease-related findings is presented in Table 1.

Evaluating the reasons of CAM use of participants, the reasons were listed as reducing cough, and wheezing (37.4%), reducing shortness of breath (22.9%), facilitating expectoration (19%), and preventing diseases such as influenza and pneumonia (14%). It was reported that 32.8% of those who recommended CAM use to patients were relatives, 26.9% were friends, and 20.9% were healthcare professionals. The reasons of CAM use and the distribution of characteristics for those who recommend it are shown in Table 2.

Considering the frequency of CAM use methods, the frequency lists were praying,

herbal products, and respiratory therapy with the percentages of 86.0%, 42.4%, and 13.4% respectively. The CAM methods use and status of benefiting are shown in Table 3. In addition, the most frequently used herbal products by patients are stated as linden tea (n=14), carob molasses (n=9), oat straw water (n=9) and ginger honey mixture (n=9) (Not shown in the table).

When CAM use, and beliefs about medicines were compared, it was found that there was a statistically significant difference between CAM use, and BMQ-T-Specific Necessity. Those with higher necessity scores used CAM more (p=0.002). It was found that there was not a statistically significant difference between CAM use and compliance with treatment (p>0.05) (Table 3).

The results of the binary logistic regression analysis performed to identify the factors effective on CAM Use of the patients are shown in Table 5. The risk of CAM use for treatment was found to be 1.522 times higher in BMQ-Specific Necessity higher score (95% CI [1.046, 2.214], p= 0.028). The CAM use was found to be 3.434 times higher in working status (unemployed) higher score (95% CI [1.328, 8.884], p = 0.011), the CAM use was found to be 4.530 times higher in income and expense status (income less than expense) higher score (95% CI [1.251-16.409], p = 0.021). The CAM use was found to be 1.443 times higher in number of exacerbations in the past year, which was a higher score (95% CI [1.068-1.949], p = 0.017) (Table 4).

**Table 1. Comparison of Sociodemographic and Clinical Characteristics of the Patients (N=244)**

Characteristics	Overall 244 (100.0)	CAM user 179 (73.4)	Non-CAM User 65 (26.6)	Statistics	p-value
Age (years) (Mean±SD)	65.95±10.76	66.66±10.10	64.15±12.30	-1.584 †	.11
<b>Gender</b>					
Male	202 (82.8)	143 (70.8)	59 (29.2)	1.986‡	<b>.04</b>
Female	42 (17.2)	36 (85.7)	6 (14.3)		
<b>Marital status</b>					
Married	196 (80.3)	144 (73.5)	52 (26.5)	0.077‡	.94
Single	48 (19.7)	35 (72.9)	13 (27.1)		
<b>Educational Status</b>					
Illiterate	12 (4.9)	10 (83.3)	2 (16.7)	1.101‡	.27
Primary school	166 (68.1)	124 (74.6)	42 (25.4)		
High school	38 (15.6)	24 (63.2)	14 (36.8)		
University and over	28 (11.5)	21 (75.0)	7 (25.0)		
<b>Working status</b>					
Employed	19 (7.8)	9 (47.4)	10 (52.6)	-2.663‡	<b>.008</b>
Unemployed	225 (92.2)	170 (75.6)	55 (24.4)		
<b>Income and expense status</b>					
Income more than expense	20 (8.2)	12 (60.0)	8 (40.0)	-2.802‡	<b>.005</b>
Equal income and expense	160 (65.6)	112 (70.0)	48 (30.0)		
Income less than expense	64 (26.2)	55 (85.9)	9 (14.1)		
<b>COPD STAGE</b>					
Stage 1	66 (27)	45 (68.2)	21 (31.8)	-1.271‡	.21
Stage 2	86 (35.2)	64 (74.4)	22 (25.6)		
Stage 3	61 (25.1)	44 (72.1)	17 (27.9)		
Stage 4	31 (12.7)	26 (83.9)	5 (16.1)		
<b>Number of exacerbations in the past year (Mean±SD)</b>	2.98±6.46	3.05±6.01	2.80±7.61	-2.627 †	<b>.009</b>

<b>Number of hospitalizations in the past year (Mean±SD)</b>	1.09±2.99	2.20±1.72	1.58±0.96	-2.798 <sup>†</sup>	<b>.005</b>
<b>Additional disease</b>					
Yes*	175 (71.7)	131 (74.9)	44 (25.1)	0.840 <sup>‡</sup>	.40
No	69 (28.3)	48 (69.6)	21 (30.4)		
<b>Smoking status</b>					
Yes	85 (34.8)	56 (65.9)	29 (34.1)		
No	25 (10.2)	23 (92.0)	2 (8.0)	-1.118 <sup>‡</sup>	.26
Quit smoking	134 (55)	100 (74.6)	34 (25.4)		
<b>Experiencing drug-related adverse events</b>					
Yes**	138 (56.6)	106 (76.8)	32 (23.2)	1.388 <sup>‡</sup>	.12
No	106 (43.4)	73 (68.9)	33 (31.1)		

Values are presented as n(%), unless specified otherwise. †: Independent samples t test, ‡: Pearson Chi-Square test, Note. COPD = chronic obstructive pulmonary disease \* Sleep disorder, diabetes mellitus, rhythm disorder, edema, osteoporosis \*\* Hoarseness, rash, thrush in the mouth, cataract, increase in intraocular pressure

**Table 2. Reasons of CAM Use and Distribution of Those Who Recommend (N=179)**

<b>Reason of CAM Use*</b>	<b>n (%)</b>
I used it because it reduced my coughing and wheezing	67 (37.4)
I used it because it helped my shortness of breath	41 (22.9)
I used it because it made it easier for me to expectorate	34 (19.0)
I used it because it prevented me from getting diseases (influenza, pneumonia, etc.)	25 (14.0)
I used it because I believed it would fight/defeat/cure COPD	18 (10.0)
I used it because it made me move more easily and increased my activity	14 (7.8)
I used it because it made me sleep more comfortably	7 (3.9)
I used it because other users were satisfied	4 (2.2)
<b>Those who recommend the use of CAM *</b>	<b>n (%)</b>
Family	22 (32.8)
Friends, neighbors	18 (26.9)
Health care professionals	14 (20.9)
Other patients with the same disease	7 (10.4)
Others (TV, radio, newspaper and magazine, internet..)	6 (9.0)

\* Patients reported more than 1 answer. Note. CAM= complementary and alternative medicine

**Table 3. Comparison of Beliefs about Medicines Questionnaire Scale and Morisky Green Levine Scale Scores of Patients According to the Use of CAM (N=244)**

BMQ-T	Overall (n=244)	CAM User (n=179)	CAM Non-User (n=65)	Z	p-value
	Median (Q1-Q3)	Median (Q1-Q3)	Median (Q1-Q3)		
BMQ-T-Specific Necessity	3.6 (3.0-4.2)	3.6 (3.0-4.2)	3.2 (2.6-4.0)	-3.066	< .001
BMQ-T-Specific Concerns	2.8 (2.2-3.2)	2.8 (2.2-3.2)	3.0 (2.4-3.2)	-1.044	.29
BMQ-T-General Overuse	3.0 (2.7-3.5)	3.0 (2.7-3.5)	3.0 (2.7-3.2)	-0.302	.76
BMQ-T-General Harm	3.0 (2.7-3.5)	3.0 (2.5-3.5)	3.0 (2.7-3.5)	-0.013	.98

  

Morisky Green Levine Scale					
	n (%)	n (%)	n (%)	$\chi^2$	p-value
Adherence	24 (9.8)	18 (10.1)	6 (9.3)	0.037	.85
Non-adherence	220 (90.2)	161 (73.1)	59 (26.9)		

Data represented either as median (Q1-Q3), or as the frequency. Note. Z: Mann Whitney U;  $\chi^2$ : Pearson Chi Square test; CAM= complementary and alternative medicine; BMQ-T= Beliefs About Medicines Questionnaire Turkish Translation.

**Table 4. Potential Risk Factors Associated with Cam Use a Binary Logistic Regression Analysis**

Covariate	$\beta$	Odds ratio*	95% CI	p
BMQ-T-Specific Necessity	0.420	1.522	1.046-2.214	.03
Working status (Unemployed)	1.234	3.434	1.328-8.884	.01
Income and expense status (Income less than expense)	1.511	4.530	1.251-16.409	.02
Number of exacerbations in the past year	0.367	1.443	1.068-1.949	.02

Note. BMQ-T= Beliefs About Medicines Questionnaire Turkish Translation; C.I=confidence interval;  $\beta$ = coefficient of predictor variables. \*Enter method was used. P = .26

## Discussion

In this study, it was found that 73.4% of patients with COPD used at least one CAM method. The most frequently used CAM methods were praying, and herbal products. A large proportion of patients reported that they used CAM in order to provide their symptom controls of COPD. According to the results of regression analysis, low-income level, not working in any job, had an increased rate in the number of hospital admissions due to exacerbation in the last year. A high belief in the necessity of medications were determined

as the most influential factors affecting CAM use in patients with COPD.

The prevalence of CAM use in the general population varies between 24% and 71.3% when studies were conducted and analysed between 2010 and 2019 (Lee et al., 2022). However, CAM use may be more common in people with chronic diseases and the methods used may differ (Helms, 2006). In patients with COPD, the prevalence of CAM use can vary between 41% and 71.2% (George et al., 2004; Sahin & Sahin, 2013). According to the results of this study, it can be said that CAM

methods are widely used in COPD patients in Turkey. In addition, in this study, patients stated that they used CAM to alleviate the symptoms they experienced due to COPD. Studies have reported that when the symptoms of patients that are poor (George et al., 2005; Ward & Baptist, 2016). Apart from the symptoms experienced due to the disease, many factors such as the cultural environment in which the patient lives, and accessibility to alternative treatments are also stated as influential factors in CAM use (Fouladbakhsh & Stommel, 2007). It has been reported that CAM use is more common in large and multicultural countries (Kemppainen et al., 2018). The fact that Turkey is a country with strong and rich cultural traditions is thought to be one of the factors affecting CAM use.

It has been reported that patients suffering from chronic diseases are more willing to try different treatment options, and that the belief in the safety of CAM due to its organic appeal to patients (George et al., 2004). It has been reported that the most commonly used CAM methods are praying and herbal treatment using (Araz et al., 2007; Ni et al., 2002). In this study, the most frequently used CAM methods were also praying and the use of herbal products. It was reported that there are researches reporting evidence that religion improves physical and mental health (Coruh et al., 2005). In particular, religious activity has been reported to improve physical and mental health, and the possible mechanism for this effect may be related to reduced stress hormone secretion through psychoneuroendocrinology. It has also been explained that religious people may be associated with increased communication within a wider social network which leads to a healthier lifestyle, which in turn leads to taking part in activities organized by religious communities (Pargament et al., 2001). In their studies, Abadoglu et al. 2008 demonstrated that 70.1% of patients with COPD who practiced CAM used herbal products, and 38.8% of them evaluated the method as useful. However, the effectiveness of herbal remedies for treating COPD has not been established (Guo et al., 2006). It may be recommended to evaluate some herbal products frequently used in patients with COPD and to elucidate the underlying mechanisms.

It is stated that the majority of information about CAM methods is obtained from mass media, and to a lesser extent from relatives who used these methods (Algier et al., 2005). Studies have reported that patients who are not employed, retired, and housewives use CAM at a higher rate (Krauskopf et al., 2015; Yavuz et al., 2007). In this study, it was observed that being unemployed in any job influenced CAM use. It is assumed that the fact that the non-working group in our study were housewives, unemployed, and retired, frequently communicated with groups of friends. These groups of individuals spent most of their time in

front of the television influenced CAM use. Furthermore, it has been reported that having a lower income affects CAM use in individuals with chronic diseases. It shows that these individuals show more positive attitudes towards CAM (Cui et al., 2012; Ozer et al., 2020). In this study, it was found that those whose income was less than their expenses used CAM more frequently. It is thought that low admission opportunity to hospitals and medicines for individuals with low income may affect CAM use.

Studies have shown that patients admitted to hospitals with COPD exacerbation within the last year used CAM more than those who did not (Abadoglu et al., 2008). Similarly, Akinci et al. (2011) reported that patients with more exacerbations, more frequent hospitalizations and severe symptoms had higher CAM use (Akinci et al., 2011). In this study, the number of hospital admissions due to exacerbation in the last year were found to be one of the important factors affecting CAM use. Despite optimal treatment, it is thought that frequent exacerbations, increased the number of hospital admissions, and thus efforts to alleviate symptoms may increase the use of CAM.

Studies have shown that CAM use is associated with treatment beliefs (Bishop et al., 2010). In their study it is examined the factors leading to CAM use, Welz et al. (2018), found that treatment concerns were the most important cause of CAM use. However, a different study showed that there was not any association between satisfaction with treatment and CAM use (Sanvisens et al., 2020). In our study, it was observed that CAM

use increased as the belief in the necessity of medicines increased. In this study, it is thought that interventions to reduce symptoms such as cough, wheezing and shortness of breath, which were detected as the most common reasons for CAM use, and to maintain well-being affect the belief in the necessity of medications.

Negative beliefs about medicines have been reported to be a strong barrier to medication compliance (Sirey et al., 2013; Sweileh et al., 2014). In addition, a meta-analysis of 94 different studies conducted between 1999 and 2015 that examined the relationship between medication compliance and beliefs about medicines reported a positive relationship between medication compliance and beliefs about the necessity of medicines and a negative relationship between medication concerns and beliefs about medicines (Murphy et al., 2014). In this study, it was observed that more than 90% of the patients did not comply with the treatment. In the study that George et al. (2005) examined the factors affecting medication non-compliance in patients with COPD, it was found that one third of the patients used CAM, while patients with a preference for natural medicines had low treatment compliance. Similarly, Krauskopf et al. (2015) found that patients with COPD who had a preference for natural medicines had a high medication non-compliance. In our study, treatment compliance was found to be low, however, CAM use had no effect on it.

**Conclusion:** As a conclusion, it was revealed that having the belief in the necessity of medications, having frequent COPD exacerbations, being unemployed, and having less income than expenses were the most influential factors affecting the use of CAM.

**Acknowledgments:** We thank the patients for taking the time to fill in the questionnaires and for contributing to the study.

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