

# The Attitude, Knowledge, and Evaluation of Herbal Medicinal Products for Respiratory Diseases in Northern Cyprus among Pharmacists, Patients, and Pulmonologists

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## ABSTRACT

**Background:** The utilization of Complementary and Alternative Medicine (CAM) has grown remarkably over the years as people seek alternative treatment methods to conventional medicine to manage various health conditions. **Aim:** The study aimed to assess the utilization of herbal remedies in treating respiratory disorders, enhance the safe and efficient use of herbal medicinal products, and raise awareness of the effectiveness of CAM in respiratory tract diseases in Northern Cyprus. **Materials and Methods:** The study was conducted on 610 respiratory patients, 10 pulmonologists, and 150 pharmacists, who participated voluntarily in the survey. The data was collected through three tailored questionnaires distributed to the target participants face-to-face and online. The collected data were analyzed using the SPSS software. **Results:** The data obtained from the survey indicated that patients with lower income and educational attainment tend to use herbal medicinal products less frequently compared to those with higher income ( $p=0.026$ ) and educational levels ( $p=0.003$ ). Pharmacists aged under 45 were more knowledgeable about herbal medicinal products than pharmacists over 45 ( $p<0.05$ ). It was observed that a substantial majority (96%) of pharmacists recommend herbal medicinal products to their patients, primarily for preventive purposes. Additionally, pulmonologists lacked knowledge of herbal medicinal compositions, posology, administration, indications, side effects, and usage warnings. **Conclusion:** The study highlights the lack of adequate information among pharmacists, patients and pulmonologists regarding using herbal medicinal products for respiratory diseases. There is a pressing need for seminars and credible resources to address this knowledge deficit.

**Keywords:** Complementary and Alternative Medicine, Pharmacists, Herbal Medicinal Products, Respiratory Diseases.

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## INTRODUCTION

The ongoing Coronavirus disease 2019 (COVID-19) pandemic is a salient reminder of the respiratory system's crucial role in human life. A data review from 1990 to 2017 reveals an 18% rise in mortality rates attributable to respiratory illnesses.<sup>1</sup> Given the growing concerns regarding the prevalence of respiratory diseases; individuals are exploring alternative approaches to maintain their health. Complementary and Alternative Medicine (CAM) has gained significant popularity in Northern Cyprus, mirroring global trends, as a complementary approach

to conventional treatments for respiratory diseases and similar illnesses. CAM is aimed at bolstering immunity, reducing symptoms, and preventing or mitigating the progression of such diseases.<sup>2</sup> This study has observed that the most frequently utilized forms of CAM for treating respiratory diseases are herbal medicinal products in the form of medicinal teas, oils, and drugs, along with breathing techniques and vitamin supplements.<sup>3</sup>

The use of herbal medicinal products continues to expand globally, accompanied by growing consumer recognition. Herbal medicinal products are widely perceived as safe for general consumption, as they are derived from natural sources. However, they do not carry official drug status from the United States Food and Drug Administration (FDA).<sup>4</sup> In Northern Cyprus, herbal medicinal products are readily available in various pharmaceutical forms, including tablets, capsules and syrups. Northern Cyprus legislation permits the sale of these products without a



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prescription at pharmacies. However, the absence of rigorous regulations in Northern Cyprus has allowed for exploitation in the form of misleading claims, which are often made by individuals without expertise, leading to the growth of distrust towards herbal preparations, particularly among healthcare professionals and within scientific communities. Pharmacists, as healthcare professionals, can provide information about the illness and make a differential diagnosis based on their knowledge of drugs. An increasing number of patient consultations about herbal medicinal products have been reported, as evidenced by several studies.<sup>5,6</sup> Consequently, it is imperative that pharmacists possess an in-depth understanding of the active constituents, indications, dosage, side effects, toxicology, and potential herb-drug/herb-food interactions of herbal medicinal products, comparable to their familiarity with conventional drugs.<sup>7</sup>

Numerous studies from various regions around the globe, including the United States, Australia, Singapore, and Nigeria, have demonstrated that pharmacists possess inadequate knowledge and insufficient ability to offer to counsel to patients regarding CAM.<sup>6,8,9</sup> Conversely, it has been noted through various studies that pharmacists engage in continuing education programs to stay abreast of developments in the field of CAM.<sup>10,11</sup> A study examining the knowledge and attitudes of 217 pharmacists towards herbal medicinal products indicated that pharmacists, who received professional education in CAM, are more competent in addressing patient needs. The study found that among the 68% of pharmacists, who worked in a pharmacy, 45.1% had undergone training in herbal medicinal products. The average score on the herbal knowledge test was 6.3 (out of 15), with pharmacists who received education exhibiting significantly higher scores than those who did not.<sup>12</sup> A study revealed that an Eighty-one percent (81%) of pharmacists felt they had inadequate skills and knowledge to counsel patients on herbal medicinal products and 90.5% felt the professional curricula should have more components on CAM.<sup>8</sup>

The present study aims to examine the attitudes and perceptions of the Northern Cyprus population regarding the use of CAMs and herbal medicinal products for the treatment of respiratory diseases, as well as to identify areas for improvement in the relationship between pulmonologists, pharmacists, and patients to ensure the safe and effective utilization of these products. Despite the increasing popularity of herbal medicinal products for respiratory ailments, there is a dearth of data on the availability and utilization of these products within Northern Cyprus and the demographic characteristics of patients and healthcare providers associated with their use.

## MATERIALS AND METHODS

This cross-sectional study evaluated patients, pharmacists, and pulmonologists' knowledge, attitudes, and practices in Northern Cyprus regarding utilizing herbal medicinal products in treating respiratory diseases between January and May of 2022.

### Design of Study and Sample

The study was conducted using a cross-sectional survey design, which included three distinct phases to gather the necessary data.

In the first stage of the study, a survey was conducted among patients undergoing treatment for pulmonary diseases at Nicosia Dr. Burhan Nalbantoglu Hospital and Kyrenia Akcicek Hospital. Participants were voluntarily enrolled and their personal information was kept confidential. A pharmacist administered the questionnaire to eligible respiratory patients who were fit to participate. Out of the 678 patients who consented to participate, 610 completed the questionnaire, and these participants constituted the sample for further analysis. The survey collected data on the demographic characteristics (age, gender, and education level) of the participants as well as their source of information and knowledge about herbal medicinal products.

The second stage of the study targeted pharmacists, for which a list of 327 licensed pharmacies was obtained from the Turkish Cypriot Pharmacists' Association. Only pharmacies that were open for a minimum of one year and operated by the pharmacist were included in the study. 177 pharmacists out of 327 licensed ones met the participation criteria and were voluntarily enrolled after being informed about the study. The participants gave verbal consent to participate and completed the questionnaire in their pharmacies. Out of the 177 pharmacists who participated, 150 completed the questionnaire, and these participants constituted the sample for further analysis.

The third phase of the study aimed to gather information from pulmonologists registered with the Turkish Cypriot Medical Association. Ten of the 22 pulmonologists approached agreed to participate in the study. These pulmonologists completed the questionnaire at their private clinics or hospital workplaces or participated online. The questionnaire collected information about their demographic characteristics, such as age, gender, and education level as a physician. This data was analyzed to understand the attitudes and practices of pulmonologists towards herbal medicinal products and their role in recommending these medicines to patients.

The data obtained from the three phases of the study provides valuable insights into the utilization patterns of herbal medicinal products for treating respiratory diseases among patients and healthcare professionals in Northern Cyprus. Further data analysis will identify gaps in knowledge, attitudes, and practices and provide recommendations for improving the utilization of

herbal medicinal products to treat respiratory diseases in the Northern Cyprus region.

### Questionnaire Design (Data Collection Form)

The questionnaires utilized in the study were created after conducting a comprehensive literature review to ensure their structural and content validity. A panel of experts, comprising 3 pharmacists from Northern Cyprus, 2 academicians (specializing in Phytotherapy and Pharmacy, as well as medicine), 2 pulmonologists, and 2 patients suffering from respiratory diseases, evaluated the questionnaires for validity. Based on the feedback received from the expert panel, modifications were made to the questions.

Each of 3 questionnaires consisted of 4 main sections, the first of which pertained to demographic information such as age, gender, and education level. This information was crucial for understanding the context, in which the participants' attitudes, perceptions, and practices towards herbal medicinal products for respiratory diseases, were shaped. The second section of the questionnaires sought to gauge the participants' perception of herbal medicinal products, including their preferred sources of information and what they valued most in terms of herbal medicinal products. The third section of the questionnaires used a five-point Likert scale to assess the attitudes of patients,

pulmonologists, and pharmacists toward herbal medicinal products. The Likert scale, ranging from (1) Always, (2) Frequently, (3) Occasionally, (4) Rarely, and (5) Never, provided a quantitative measure of the participant's attitudes towards herbal medicinal products. The fourth section of the questionnaires aimed to determine the participants' knowledge about the indications, contraindications, side effects, and interactions of herbal medicinal products.

All questions were presented in Turkish and were closed-ended with the questionnaires taking approximately 15-20 min to complete. A pilot study involved 25 independent pharmacists, 2 pulmonologists, and 15 respiratory patients to assess the questionnaires' clarity, reliability, acceptability, and completion time. The data obtained from the pilot study was not included in the final data analysis.

### Statistical Analysis

The frequency of responses to the questions was depicted by calculating percentage values. To evaluate the relationship between the variables, the Pearson Chi-Square test was employed, with a significance level set at 0.05 ( $p < 0.05$ ) throughout the study. The data collection process was facilitated through the use of the Survey Monkey website. In addition, Microsoft Excel software was employed to create supplemental graphics, while SPSS version

**Table 1: Patient, pharmacist, and pulmonologist demographic information.**

Demographic Information	Patients (n=610)	Pulmonologists (n= 10)	Pharmacists (n= 150)
Age	n (%)	n (%)	n (%)
<18	5 (0.82%)		
18 - 24	36 (5.90%)		2 (1.33%)
25 - 34	138 (22.62%)	1 (10%)	102 (68%)
35 - 44	189 (30.98%)	5 (50%)	18 (12%)
45 - 54	117 (19.18%)	2 (20%)	12 (8%)
55 - 64	72 (11.80%)	1 (10%)	10 (6.67%)
>65	53 (8.69%)	1 (10%)	6 (4%)
Gender			
Female	347 (56.89%)	5 (50%)	102 (68%)
Male	263 (43.11%)	5 (50%)	48 (32%)
Education Level			
Primary	24 (3.93%)		
Secondary	26 (4.26%)		
High School	191 (31.31%)		
Associate Degree	47 (7.70%)		
Graduate	202 (33.11%)		69 (46%)
Post-Graduate	86 (14.1%)	7 (70%)	62 (41.33%)
Doctorate	34 (5.57%)	1 (10%)	19 (12.67%)
Post-Doctorate		2 (20%)	

26.0 for Mac was used as the primary software for conducting the analytical statistics.

## RESULTS

### General Characteristics of Patients, Pharmacists, and Pulmonologists

A cross-sectional study on respiratory patients revealed that out of 678 eligible patients, 610 returned fully completed questionnaires with a response rate of 89.98%. A demographical analysis of the patients revealed that most respondents were females (56.89%), and the largest age group was 35-44 years old (30.98%). In terms of educational attainment, the majority of the patients had a university degree (33.11%).

The demographic information of pharmacists, who participated in the study was also collected, with 150 out of 177 pharmacists returning fully completed questionnaires (response rate of 84.75%). Most pharmacists who participated in the study were female (68%), and the largest age group was between 25-34 years old (68%). In terms of educational attainment, the majority of pharmacists had a university degree (46%).

Out of the 22 pulmonologists who were approached, 10 returned completed questionnaires. The demographic analysis revealed that half of the respondents were female (50%), and the largest age group was between 35-44 years old (50%). The majority of pulmonologists had postgraduate education (70%). Table 1 provides a comprehensive illustration of the demographic information of patients, pharmacists, and pulmonologists who participated in the study.

### Findings among Patients

This study found that most patients (or 75.88%), procured herbal medicinal products from pharmacies. The remaining portion of

patients obtained herbal preparations from herbalists, grocery stores or markets. Results indicated that 65.06% of low-income patients, 49.12% of middle-income patients, and 39.43% of high-income patients rarely or never used herbal medicinal products. Conversely, 27.71% of low-income patients, 36.18% of middle-income patients, and 46.47% of high-income patients reported occasional use of herbal medicinal products. A relatively small proportion of patients in each income group reported frequent or constant use of herbal medicinal products: 7.23% of low-income patients, 14.69% of middle-income patients, and 14.08% of high-income patients ( $p = 0.026$ ). These findings demonstrate a significant positive correlation between income level and herbal medicinal products use ( $p < 0.05$ ). Table 2 compares patients' income levels and herbal medicinal products' use.

Furthermore, the relationship between patients' education level and herbal medicinal products use was analyzed. Results showed that 48.55% of patients with a high school education or earlier reported rarely or never using herbal medicinal products, while 57.42% of patients with an associate or bachelor's degree and 38.33% with a postgraduate degree reported the same. On the other hand, 34.44% of patients with a high school education or earlier, 31.73% with an associate or bachelor's degree, and 47.5% with a postgraduate degree reported occasional use of herbal medicinal products. Finally, 17.01% of patients with a high school education or earlier reported frequent or constant use of herbal medicinal products, whereas 10.84% of patients with an associate or bachelor's degree and 14.17% with a postgraduate degree reported the same ( $p = 0.003$ ). These findings are statistically significant and suggest a significant correlation between education level and herbal medicinal products use ( $p < 0.05$ ). Table 3 illustrates patients' education level and use of herbal medicinal products.

**Table 2: Comparison Between Level of Income and Use of Herbal Medicinal Products in Patients.**

			Use of Herbal Medicinal Products				<i>p</i>
			Never or very rarely	Occasionally	Frequently or always	Total	
Income	Low	n	54	23	6	83	0.026
		%	65.06%	27.71%	7.23%	100%	
	Middle Level	n	224	165	67	456	
		%	49.12%	36.18%	14.69%	100%	
	High	n	28	33	10	71	
		%	39.43%	46.47%	14.08%	100%	
	Total	n	306	221	83	610	
		%	50.16%	36.23%	13.61%	100%	



**Table 3: Comparison Between Level of Education and Use of Herbal medicinal products in patients.**

			Use of Herbal medicinal products				p
			Never or very rarely	Occasionally	Frequently or always	Total	
Education Level	High School or earlier	n	117	83	41	241	0.003
		%	%48.55	%34.44	%17.01	%100	
	Associate's and Bachelor's	n	143	79	27	249	
		%	%57.42	%31.73	%10.84	%100	
	Postgraduate	n	46	57	17	120	
		%	%38.33	%47.5	%14.17	%100	
Total		n	306	219	85	610	
		%	%50.16	%35.90	%13.93	%100	

### Findings among Pharmacists

The results showed that pharmacists most frequently utilized undergraduate education (82.67%), followed by the internet - social media (68.67%), books and magazines (48%), and media (television, radio, and newspaper) (16%) as sources of information.

Furthermore, the study investigated the frequency with which pharmacists recommended herbal medicinal products. A substantial proportion of pharmacists (96%) reported that they made recommendations for herbal medicinal products, and among those, who made such recommendations, 58.78% indicated that they did so to protect patients with a known health risk history. Additionally, 42.57% of pharmacists reported that they recommended herbal medicinal products due to their low or absence of side effects, while 4% of pharmacists who did not recommend herbal medicinal products their cited safety concerns.

The survey findings revealed that pharmacists possessed more excellent knowledge regarding the composition (56.67%), posology (54.67%), administration methods (54.67%), indications (62%), side effects (52%), and usage warnings (54%) of herbal medicinal products compared to other aspects such as contraindications (45.33%). The results showed that pharmacists aged 45 and over were more likely to have limited knowledge of the composition of herbal medicinal products, with 67.86% stating they had little to no knowledge, compared to 37.7% of pharmacists aged 18-44 ( $p = 0.004$ ). A similar trend was observed for the pharmacists' knowledge of herbal medicinal products' side effects, with 78.57% of pharmacists aged 45 and over-reporting little to no knowledge, compared to 40.98% of pharmacists aged 18-44 ( $p = 0.004$ ). Concerning herb contraindications, the study found that a more significant proportion of older pharmacists aged 45 and over (85.71%) declared having little to no knowledge

compared to younger pharmacists aged 18-44 (47.54%) ( $p = 0.001$ ). The results of this analysis are summarized in Table 4.

### Findings among Pulmonologists

According to the survey study, 10 pulmonologists were queried regarding their usage and recommendation of herbal medicinal products for pulmonary diseases. Results indicated that 60% of pulmonologists stated that they either "rarely use" or "never use" herbal medicinal products, while the remaining 40% reported that they "use" herbal medicinal products. However, when questioned regarding the recommendation of herbal medicinal products to their patients during treatment, only 4 out of 10 pulmonologists reported recommending herbal medicinal products.

Furthermore, the survey delved into the knowledge base of pulmonologists regarding the composition, side effects, usage warnings, contraindications, posology, and administration methods of herbal medicinal products that they might recommend to their patients. The results revealed that the pulmonologists possessed insufficient knowledge about composition (55.56%), posology (66.67%), indication (66.67%), side effects (66.67%), usage warnings (66.67%) and contraindications (77.78%) of herbal medicinal products.

## DISCUSSION

The utilization of CAM has been on the rise globally as people look for alternative treatments to conventional medicine to manage various health conditions. The present study focuses on using herbal remedies to treat respiratory disorders in Northern Cyprus. The study found that most patients (52.3%) primarily sought information about herbal medicinal products from pharmacists, followed by physicians (41.91%). The study also found a correlation between the use of herbal medicinal products and the income and education level of the patients, with higher utilization among those with higher income and education.

**Table 4: The Relationship Between Pharmacists' Age and Compositions, Side Effects, and Contraindications of Herbal medicinal products.**

Composition of Herbal Medicine						
			Has no or little knowledge	Has knowledge	Total	<i>p</i>
Age	18-44	n	46	76	122	0.004
		%	37.7%	62.3%	100%	
	45 and over	n	19	9	28	
		%	67.86%	32.14%	100%	
Total		n	65	85	150	
		%	43.33%	56.67%	100%	
Side Effects of Herbal Medicine						
			Has no or little knowledge	Has knowledge	Total	<i>p</i>
Age	18-44	n	50	72	122	0.004
		%	40.98%	59.02%	100%	
	45 and over	n	22	6	28	
		%	78.57%	21.43%	100%	
Total						
		n	72	78	150	
		%	48%	52%	100%	
Contraindivations of Herbal Medicine						
			Has no or little knowledge	Has knowledge	Total	<i>p</i>
Age	18-44	n	58	64	122	0.001
		%	47.54%	52.46%	100%	
	45 and over	n	24	4	28	
		%	85.71%	14.29%	100%	
Total						
		n	82	68	150	
		%	54.67%	45.33%	100%	

The results indicated that patients should prioritize pharmacies as their primary source for obtaining information about herbal medicinal products and seek information from trained pharmacists and physicians. The study also revealed that pharmacists often acquire information about herbal medicinal products through undergraduate education and the internet - social media, but the lack of a scientific evaluation process for the information on these sources raises concerns about potential inaccuracies. It is noteworthy that other studies have revealed that patients frequently obtain information about herbal medicinal products from the Internet, herbalists, friends, media, and neighbors.<sup>13,14</sup>

As previously documented in various studies,<sup>15-17</sup> a significant proportion of patients have reported their preference for herbal

medicinal products due to perceiving them as more dependable and with fewer adverse effects than conventional medications. As a result of this study, it was concluded that the most reliable information about herbal medicinal products should be obtained from trained pharmacists and physicians. The study's findings indicate that respiratory tract patients sought information from the appropriate sources. The pharmacy was the most commonly cited source of obtaining herbal medicinal products, with 75.88% of patients reporting this as their primary source. This result aligns with the findings of a similar study conducted in Bulgaria.<sup>18</sup> The Health System can play a crucial role in enhancing patient awareness and directing them to pharmacies, which are the appropriate sources for obtaining herbal medicinal products, by implementing various public health initiatives.

Furthermore, a comparison between the use of herbal medicinal products and patients' income level demonstrated a significant relationship ( $p=0.026$ ). The results revealed that respiratory tract patients with higher income levels were more likely to use herbal medicinal products than those with lower income levels, concurring with similar findings in an investigation conducted in Iran.<sup>19</sup> This finding contrasts with previous studies that have demonstrated a relationship between herbal medicinal products usage and socioeconomic status, wherein individuals with lower income levels have greater access to CAM.<sup>20</sup>

The utilization of herbal medicinal products has been observed to increase in conjunction with the educational level of patients ( $p=0.003$ ), which aligns with the results of multiple prior studies.<sup>21,22</sup> However, the correlation between increased education level and increased usage of herbal medicinal products does not guarantee the proper and informed utilization of these remedies.

The present study also revealed that a significant proportion of pharmacists acquire information about herbal medicinal products through undergraduate education (82.67%) and the internet - social media (68.67%). Other sources include books and magazines (48%) along with the media (16%). These findings are consistent with previous studies on the same subject.<sup>8,23</sup> Several studies have highlighted the unverified quality and reliability of the information on herbal medicinal products on the internet - social media. The lack of a scientific evaluation process for the information on these websites raises concerns about the potential for pharmacists to provide incorrect information to patients, leading to undesirable outcomes. To mitigate such issues, pharmacists must receive training programs that educate them on the most accurate and efficient methods of obtaining information about herbal medicinal products.<sup>24,25</sup>

The study in Northern Cyprus revealed a higher rate of pharmacists recommending herbal medicinal products compared to previous studies, with 96% of pharmacists advocating for their use and only 4% refraining from doing so. Other studies corroborate these findings.<sup>11,26</sup> The pharmacists who did not recommend herbal medicinal products cited concerns about the reliability of these products as a result of insufficient evidence regarding their efficacy and potential adverse effects. In contrast, another study highlights the controversial nature of herbal medicinal products, which are not subject to FDA approval, and thus, the safety of these products is a matter of debate among pharmacists due to the paucity of clinical research in this area.<sup>27</sup>

The study results indicate that pharmacists, who participated possess a greater understanding of the composition, dosage, administration methods, and indications of herbal medicinal products, while their knowledge of contraindications is comparatively limited. This finding aligns with previous studies.<sup>6,28,29</sup> The level of knowledge regarding herbal medicinal products among pharmacists may vary even within a single

country and it cannot be assumed that different pharmacy programs in universities provide uniform and comprehensive education on herbal medicinal products. To enhance pharmacists' knowledge of herbal medicinal products, it is imperative to standardize the curriculum and increase the coverage of CAM in pharmacy programs across various countries.

Furthermore, the findings suggest a positive correlation between the pharmacists' knowledge of herbal medicinal products and their age with pharmacists between the ages of 18-44 demonstrating a higher level of knowledge than pharmacists over the age of 45 ( $p<0.05$ ). Although there is limited literature on the relationship between age and knowledge of herbal medicinal products, some studies have reported opposing results, with older pharmacists being more knowledgeable about herbal medicinal products. This discrepancy may be attributed to declining or eliminating Pharmacognosy courses from current curricula of the pharmacy faculties.<sup>30,31</sup>

The study aimed to assess pulmonologists' habits, knowledge, attitudes, and evaluations concerning using herbal medicinal products in Northern Cyprus. The small sample size limited the study, as only 10 out of 22 pulmonologists were reached. Despite this constraint, a literature review revealed a dearth of studies focused specifically on pulmonologists, with most studies centering on physicians.

Given the ongoing COVID-19 pandemic and its emphasis on respiratory illnesses, it is crucial to shed light on using herbal medicinal products by pulmonologists. In the study examining the habits, knowledge, attitudes, and evaluations of pulmonologists in Northern Cyprus regarding herbal medicinal products, a sample of 10 pulmonologists was assessed. The sample size was limited by the number of pulmonologists in Northern Cyprus, hindering the feasibility of conducting extensive research in this area. The study was informed by a literature review, which revealed a lack of studies specific to pulmonologists. Despite this, the investigation into pulmonologists' habits and attitudes toward herbal medicinal products is of particular importance in light of the ongoing COVID-19 pandemic and the heightened attention it has brought to pulmonary diseases.

When asked about the pulmonologist prescribing habits, 40% of the pulmonologists reported recommending herbal medicinal products to their patients, while 60% did not. A study conducted by the Rochester Mayo Clinic in the US found that 44% of physicians recommended herbal medicinal products.<sup>32</sup> Another study has also produced comparable results.<sup>33</sup> However, in a study conducted in Germany,<sup>34</sup> more than half (51%) of participating physicians reported recommending herbal medicinal products to their patients. This discrepancy may be attributed to the greater accessibility and promotion of CAM methods, such as homeopathy, aromatherapy, and phytotherapy, in Germany, along with a higher frequency of science-based clinical studies

and educational seminars and conferences on this subject.<sup>35</sup> The low rate of recommendation for herbal medicinal products among pulmonologists in Northern Cyprus may be due to a lack of adequate curriculum on the subject in medical schools, as well as short in-service pieces of training offered by the Ministry of Health of Northern Cyprus and a scarcity of feedback from patients regarding the effectiveness and side effects of herbal medicinal products in their treatment.

The results of the investigation into the pulmonologists' knowledge of herbal medicinal products in the present study revealed an inadequate understanding of contraindications (77.78%), posology (66.67%), side effects (66.67%), indication (66.67%), and ingredients (55.56%). It is consistent with a similar study conducted in Kuwait, which concluded that general practitioners have limited and fragmented information (62.5%) about herbal medicinal products.<sup>36</sup> In contrast, a comprehensive study in Iran indicated that physicians have a poor understanding of herbal medicinal products.<sup>37</sup> This lack of knowledge among physicians impairs their ability to recommend herbal medicinal products as CAM treatment options in conjunction with conventional treatments.

Thus, physicians must engage in regular training programs on herbal medicinal products to update their knowledge and become more informed about their compositions, indications, and side effects, thereby increasing their likelihood of recommending herbal medicinal products in conjunction with conventional treatments.<sup>38</sup> However, poor communication between physicians and pharmacists increases the risk of drug-herb interaction. Strengthening the communication between these healthcare professionals would facilitate patient monitoring and minimize the risk of errors.

## CONCLUSION

The present study aimed to evaluate patients, pharmacists, and pulmonologists' attitudes, approaches, and knowledge regarding using herbal medicinal products in respiratory diseases. This study, conducted in Northern Cyprus, is the first comprehensive national study to address this issue. The results showed that while respiratory patients in Northern Cyprus generally understood where to seek advice and obtain herbal medicinal products, they lacked sufficient knowledge of their potential side effects or hazards and believed that herbal medicinal products are natural and benign. The study found that pharmacists were aware of the potential benefits of using herbal medicinal products in conjunction with conventional medicine in treating respiratory diseases and needed to be updated on the use, composition, dosages, indications, and contraindications of herbal medicinal products through educational programs. Pulmonologists, however, were found to lack good recommendations for herbal medicinal products to their patients due to the limited

scientific data available, the absence of robust studies, and inadequate training on this subject in the undergraduate education of physicians. The findings suggest that there is a need for further research and education on herbal medicinal products in Northern Cyprus to enhance their safe and effective use in treating respiratory diseases, which can be achieved by increasing awareness, strengthening pharmaceutical curricula, and improving the knowledge levels of healthcare providers and patients through training programs.

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## CONFLICT OF INTEREST

The authors declare no conflict of interest.

## ABBREVIATIONS

**CAM:** Complementary and Alternative Medicine; **FDA:** Food and Drug Administration.

## SUMMARY

The study's goal was to evaluate herbal remedies for treating respiratory disorders in Northern Cyprus and improve these medications' safe and efficient use. The survey included 610 respiratory patients, 10 pulmonologists, and 150 pharmacists, who completed three tailored questionnaires. According to the findings, patients with lower income and education levels use herbal medicinal products less frequently than those with higher income and education levels. The data revealed a lack of adequate information regarding the use of herbal medicinal products for respiratory diseases among pharmacists, patients, and pulmonologists, highlighting the need for seminars and credible resources to address this knowledge gap.

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