



## Natural Remedies in the Management of Pneumonia and COVID-19

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DOI: [10.53762/grjnst.03.04.16](https://doi.org/10.53762/grjnst.03.04.16)

### Abstract

Pneumonia and COVID-19 are serious respiratory diseases that result in considerable global morbidity and mortality. Alongside conventional treatments, herbal medicines and homeopathic solutions are extensively utilized for alleviating symptoms and bolstering immune function. The aim of current study is to study the role of natural remedies in pneumonia and COVID management. This study was conducted by questionnaire survey of pneumonia and COVID patients, to investigate their different gender and their dosage regimen therapeutic effect, side effect and use of plants included *Artemisia annua*, *Glycyrrhiza radix*, *Olea europaea*, *Zingiber officinale*, *Mentha piperitum* and *Nigella sativa* in Karachi. These plants have significant antiviral, antibacterial and anti-inflammatory effects. These bioactive chemicals function by obstructing viral entry and replication, diminishing inflammatory cytokines and altering immunological responses. Prevalent cures encompass herbal infusions, ginger, turmeric and steam inhalation. Although advantageous as adjunctive care, they cannot supplant pharmacological interventions in severe instances, underscoring the necessity for additional clinical validation.

**Keywords:** *Pneumonia, COVID-19, Medicinal plants, Home remedies, Phytochemicals, Antiviral activity, Antibacterial activity, Integrative medicine.*

### Introduction

Pneumonia and COVID-19 are respiratory conditions that pose significant global health risks. Pneumonia, an infection of the lungs caused by numerous pathogens including bacteria,

viruses and fungi, induces inflammation, fluid accumulation in the lungs, leading to respiratory difficulties and in extreme instances, mortality. COVID-19 has led to millions of infections and fatalities globally, with the disease being caused by the SARS-CoV-2 (Severe Acute Respiratory Syndrome Coronavirus 2) virus (Lai et al., 2020). Both diseases necessitate swift, efficient management and although pharmaceutical interventions like antibiotics and antiviral medications are frequently employed, there is increasing interest in complementary and alternative therapies, including medicinal botanicals and home remedies, to alleviate symptoms and enhance recovery outcomes. In the research we conducted of 80 participants, 56.25% were female and 43.75% were male. 43.75% utilized herbal teas for COVID-19, whereas 25% employed ginger and turmeric tea, herbal teas and steam inhalation for pneumonia. Furthermore, 21.25% of persons deemed these remedies effective for COVID-19 and 25% for pneumonia, illustrating the persistent application of supportive strategies.

For decades, medicinal herbs have been utilized in several traditional medicine systems for treating respiratory disorders. Numerous plants like *Artemisinin annua*, *Glycyrrhiza glabra*, *Olea europaea*, *Zingiber officinale* etc. possess bioactive chemicals that demonstrate antibacterial, antiviral, anti-inflammatory and immunomodulatory properties, potentially aiding the body in combating respiratory illnesses such as pneumonia and COVID-19 (Chakotiya et al., 2018). Alongside medicinal plants, consumers frequently employ home remedies such as herb teas, steam inhalation of holy basil, lemon, ginger, kalonji and various alternative remedies to mitigate symptoms and promote recovery. These therapies are thought to enhance immunity, diminish inflammation and alleviate symptoms (Banerjee et al., 2023).

This literature review seeks to examine the impact of medicinal plants and home remedies on the treatment of pneumonia and COVID-19. This study will analyze the potential mechanisms of action of these medicinal plants, their effectiveness, safety and the possibilities for their incorporation into conventional medical care.

## **Methodology**

A systematic, self-conducted survey was developed to evaluate the consumption of medicinal plants and home medicines for the treatment of pneumonia and COVID-19. The survey comprised closed and open-ended questions, concentrating on treatment, use of home remedies, symptoms severity, perceived efficacy and demographic data. The poll was disseminated online via platforms like Google Forms, aimed at persons with experience of

medicinal herbs or home treatments for pneumonia or COVID-19. Descriptive statistics were employed to analyze the quantitative data, encompassing frequencies and percentages. Thematic analysis was conducted on qualitative replies to identify prevalent trends.

## **Result**

A total of 80 participants completed the survey, including 45 females (56.25%) and 35 males (43.75%), with the majority belonging to the 20–30 years age group. Among participants, 35 individuals (43.75%) reported using home remedies for managing COVID-19 symptoms, with herbal teas being the most frequently used intervention. Fever or chills were reported by 26 participants (32.5%), cough by 26 participants (32.5%) and shortness of breath by 29 participants (36.25%), while fatigue, headache and loss of taste were also frequently experienced. In terms of severity, 20 participants (25%) reported severe illness, 17 (21.25%) moderate and 10 (12.5%) mild symptoms. The duration of symptoms lasted 1–2 weeks for 20 respondents (25%), with some reporting prolonged recovery. Regarding medications, 20 participants (25%) were prescribed antiviral drugs, 18 (22.5%) received over-the-counter (OTC) medications and 12 (15%) were treated with antibiotics. A total of 40 participants (50%) were fully vaccinated against COVID-19, while 25 (31.25%) were partially vaccinated. In terms of preventive measures, the majority reported wearing masks (58 participants, 72.5%), followed by regular hand washing or sanitizing (50 participants, 62.5%), social distancing (45 participants, 56.25%), avoiding crowded places and working or studying from home. Perceived effectiveness of home remedies was reported by 17 participants (21.25%) who indicated improvement in their symptoms after using traditional interventions.

For pneumonia management, 20 participants (25%) used home remedies, with ginger and turmeric tea, herbal teas and steam inhalation being the most common choices. The most reported symptoms were cough (27 participants, 33.75%), shortness of breath (26 participants, 32.5%) and fever or chills (21 participants, 26.25%), alongside chest pain, fatigue, headache and rapid breathing in several cases. In terms of symptom severity, 15 participants (18.75%) experienced severe illness, 10 (12.5%) moderate and 7 (8.75%) mild symptoms. Symptoms lasted 1–2 weeks for 19 respondents (23.75%). In terms of prescribed medications, 19 participants (23.75%) used antibiotics such as azithromycin, amoxicillin and levofloxacin, alongside 14 (17.5%) receiving oxygen therapy and other supportive

medications including expectorants, analgesics and steroids. A total of 16 participants (20%) had received a pneumococcal vaccine.

Regarding preventive measures, 20 participants (25%) reported taking precautions to prevent the spread of pneumonia, 16 (20%) were unaware of such measures and 18 (22.5%) took no precautions. Effectiveness of home remedies for pneumonia was reported by 20 participants (25%), who indicated that these interventions provided symptomatic relief. Post-infection, 15 participants (18.75%) reported chronic fatigue or weakness, while 16 (20%) experienced sleep disturbances as long-term complications following recovery from COVID-19 or pneumonia.

## **Discussion**

### **Reliance on Home Remedies and Medicinal Plants**

Findings underscore the persistent reliance on home remedies despite availability of conventional therapies, including pneumonia and COVID-19. Notwithstanding the extensive accessibility of traditional medical therapies, numerous individuals persist in seeking natural remedies for alleviation of symptoms and support in recovery. The survey indicated that herbal teas and steam inhalation were frequently utilized for COVID-19, whereas therapies such as ginger, turmeric tea and herbal teas were widespread for pneumonia. These findings correspond with the current literature, which underscores the ongoing utilization of medicinal herbs for their purported therapeutic advantages in addressing respiratory ailments (De-Oliveira et al., 2022; Mesri et al., 2021).

### **Effectiveness of Medicinal Plants**

Numerous medicinal herbs exhibited notable bioactive qualities that may aid in the management of pneumonia and COVID-19 symptoms. Ginger (*Zingiber officinale*), recognized for its antiviral characteristics, has demonstrated efficacy against numerous respiratory viruses, rendering it a significant adjunct in symptom management (De-Oliveira et al., 2022). The antibacterial efficacy is substantiated by scientific research, particularly against pneumonia-inducing pathogens such as *K. pneumoniae* via methanolic extract. A clinical investigation demonstrated the significant impact of a daily 300mg dose in diminishing inflammatory markers such as procalcitonin and NLR in pneumonia patients, highlighting its efficacy as an adjunctive therapy. *Pseudomonas aeruginosa* lung infection was assessed in Swiss albino mice for the antibacterial efficacy of *Zingiber officinale*,

demonstrating a remarkable reduction in bacterial load and count, as well as an improvement in lung histology (Chakraborty et al., 2022). A clinical trial demonstrated that patients receiving a combination of ginger and Echinacea alongside standard treatment did not exhibit significant changes in hospitalization rates; however, the intervention alleviated certain clinical symptoms, including coughing, shortness of breath and muscle pain, in the subjects. This indicates that ginger cannot be utilized directly as a treatment; rather, it possesses significant potential as an adjunctive therapy for COVID-19 (Sujana et al., 2013).

Similarly, turmeric (*Curcuma longa*), known for its anti-inflammatory properties, is frequently utilized to alleviate lung inflammation and enhance respiratory function (Mesri et al., 2021). These herbs including *Artemisia annua* (Artemisinin) and *Olea europaea* (olive leaf), exhibit significant anti-inflammatory, antiviral and antibacterial properties, corroborating their traditional application in respiratory therapies (Fouka et al., 2021; Chakotiya et al., 2018). *Nigella sativa* possesses potent antibacterial and anti-inflammatory effects. Research indicates that *N. sativa* possesses bioactive substances, including thymoquinone, carvacrol, thymol and alpha hederine, which facilitate bronchiolar dilatation, particularly in COPD patients. The extract diminishes inflammation and oxidative stress in the lungs in a dose-dependent manner, reflecting its immunomodulatory, anti-inflammatory, antioxidant and antibacterial effects (Xie et al., 2020). Essential oils of *Mentha piperita* (peppermint) comprise many bioactive components, such as menthone and menthanol, which possess the capability to prevent the replication of certain viruses, including the COVID-19 virus (Sattar et al., 2024).

The extract of *Mentha piperita* (peppermint) roots exhibits notable antibacterial activity, with inhibition zones measuring 3-6 mm against *Bacillus subtilis* and *Streptococcus pneumoniae*. Research indicates that the ethyl acetate leaf extract exhibits superior antibacterial activity (5.8- 14.7 mm inhibition zone) compared to traditional antibiotics such as penicillin and tetracycline, hence enhancing its efficacy as a natural antimicrobial (Ufuk et al., 2024).

Table 3 demonstrates that various medicinal herbs, such as *Artemisia annua*, *Sambucus javanica*, *Lonicera japonica*, *Glycyrrhiza radix* and *Olea europaea*, display notable antiviral efficacy against SARS-CoV-2 and associated virus strains. These extracts function through mechanisms including the prevention of viral replication, the suppression of viral entry via ACE2 receptor binding and the decrease of inflammatory cytokines such as TNF- $\alpha$ . *Zingiber officinale* and *Mentha piperita* exhibit significant efficacy against bacterial pathogens such as

*Pseudomonas aeruginosa* and *Klebsiella pneumoniae*, which are implicated in subsequent pneumonia following viral infections. Their capacity to diminish bacterial load and inflammation in the lungs underscores their potential function in addressing consequences of viral pneumonia linked to COVID-19.

### **Challenges in Severe Cases and the Role of Pharmaceutical Treatments**

In severe cases of both COVID-19 and pneumonia, dependence on home cures or herbal treatments proves inadequate, underscoring the essential requirement for evidence-based pharmaceutical interventions. Severe COVID-19 can swiftly advance to consequences including acute respiratory distress syndrome (ARDS), systemic inflammatory response, multi-organ failure and coagulopathy, frequently necessitating hospitalization, oxygen treatment, corticosteroids and antivirals (Ufuk and Savaş, 2022; Aiyegbusi et al., 2021). Likewise, acute bacterial pneumonia, especially when induced by organisms such as *Streptococcus pneumoniae*, *Klebsiella pneumoniae*, or *Pseudomonas aeruginosa*, may result in pleural effusion, septicemia or respiratory failure if not swiftly addressed with suitable antibiotics (Lopez-Leon et al., 2021). The survey indicated that 25% of respondents with COVID-19 and 18.75% of those with pneumonia experienced severe sickness, with many reporting the utilization of prescription medications such as antivirals, antibiotics, steroids and oxygen support. Although herbal medicines may mitigate minor symptoms and enhance recovery through their immunomodulatory and anti-inflammatory properties, they cannot replace focused pharmaceutical interventions in advanced instances. Clinical recommendations generally advocate for the prompt use of antimicrobials, corticosteroids and oxygen therapy in instances exhibiting respiratory distress or radiographic indications of pulmonary involvement (Baskaran et al., 2021). This highlights the necessity for integrative treatment strategies in which herbal and supportive therapies augment but do not supplant conventional medical care for severe respiratory infections.

### **Post-Infection Complications and Long-Term Recovery**

Post-infection problems are commonly reported in both COVID-19 and pneumonia cases, frequently prolonging the recovery process beyond the acute phase. Individuals recovered from COVID-19 frequently experience chronic restlessness, dyspnea, sleep irregularities and cognitive impairment symptoms that may last for weeks or even months (Li et al., 2025; Calder, 2020). Multidisciplinary groups are essential for formulating preventive interventions, rehabilitation approaches and clinical management techniques that use a

holistic approach to long COVID-19 care (Vindegard et al., 2020). Individuals who have survived pneumonia may experience persistent symptoms, including diminished lung capacity, chronic cough or increased susceptibility to reinfection (Weng et al., 2019). In the survey, 18.75% of patients indicated persistent exhaustion, whereas 20% encountered sleep-related problems following recovery from either disease.

These findings indicate that complete healing is not always instantaneous and may necessitate ongoing medical intervention and supportive care. Pulmonary rehabilitation, balanced nutrition and psychological counseling can help restore health and quality of life following COVID-19 or pneumonia infection. COVID-19 survivors with persistent respiratory damage benefit from pulmonary rehabilitation programs in exercise capacity, lung function and discomfort (Gao et al., 2023; Weng et al., 2019). A balanced, nutrient-dense diet can facilitate healing by enhancing immune function, mitigating inflammation and encouraging tissue repair (Abdelgawad et al., 2022). Furthermore, psychological counseling and support might mitigate the mental health repercussions of severe respiratory infections including anxiety, despair and post-traumatic stress disorder (Sousa et al., 2023).

### **Preventive Measures and Vaccination**

The survey results highlighted the significance of preventive strategies in mitigating the transmission of COVID-19 and pneumonia. A considerable percentage of individuals complied with guidelines, including mask-wearing (72.5%) and social separation (56.25%), demonstrating robust adherence to public health recommendations. The significance of vaccination was unequivocally illustrated, as 50% of subjects were fully immunized against COVID-19. These findings correspond with international health guidelines, emphasizing the efficacy of immunization in mitigating infection severity and limiting the transmission of respiratory disorders.

### **Conclusion**

Medicinal plants and home medicines have potential supporting functions in the management of pneumonia and COVID-19 because to their antiviral, antibacterial and anti-inflammatory activities. Conventional methods such herbal teas, ginger, turmeric and steam inhalation may alleviate symptoms and facilitate healing. Nevertheless, they cannot supplant medicinal interventions in severe instances. A comprehensive strategy that merges conventional treatment with proven herbal medicines may yield superior results. Additional clinical trials are required to validate safety, effectiveness and standardized application.

**Table 1: Demographic Characteristics, Vaccination Status and Preventive Measures**

Characteristics	Category	Count	Percentage (%)
Age	20-Nov	25	68.75%
	20-50	55	31.25%
Gender	Female	45	56.25%
	Male	35	43.75%
Vaccination status	Fully Vaccinated (COVID-19)	40	50%
	Partially Vaccinated (COVID-19)	25	31.25%
	Pneumococcal Vaccine	16	20%
Preventive Measures	Mask Wearing	58	72.50%
	Handwashing/Sanitizing	50	62.50%
	Social Distancing	45	56.25%

**Table 2: Clinical Characteristics and Herbal Remedy %**

Category	Count	Percentage (%)
Used Home Remedies (COVID-19)	35	43.75%
Used Home Remedies (Pneumonia)	20	25%
Severe COVID-19	20	25%
Moderate COVID-19	17	21.25%
Mild COVID-19	10	12.50%
Severe Pneumonia	15	18.75%
Moderate Pneumonia	10	12.50%
Mild Pneumonia	7	8.75%

Table 3: Medicinal Plants, Phytochemicals their Antiviral and Antibacterial Efficacy

Plant Name	Chemical Constituents	Solvent Used	Strain, Subtype	Conc. \ Dose	Bioactivity	Ref.
<i>Artemisinin annua, Artemisinin afra</i>	Artemisinin, sesquiterpene lactone, flavanoids, phenol	DMSO (Dimethyl Sulfoxide)	SARS-CoV-2 FCoV	0.0004 mg/mL not < 1mg/mL	Antiviral effects, no plaque formation, ↓ FCoV replication.	(Nie 2021)
<i>Sambucus javanica</i>	Caffeic acid, chlorogenic acid, gallic acid	Ethanol	HCoV-NL63	1.17 to 15.75 µg/ml	↓ viral yield, plaque formation and virus attachment	(Weng 2019)
<i>Lonicerae japonicae</i>	Flavonoids, organic acids, volatile oil, triterpenoids	Distilled water, ethanol	SARS-COV-2	100 mg/ml	SARS-COV-2 spike protein's ↓ capacity to attach to ACE2, ↓ ACE2	(Gao 2023)
<i>Glycyrrhiza Radix et Rhizome</i>	Glycyrrhizin, glycyrrhetic acid, acetamido derivative	Distilled water	SARS-COV-2	0.44 mg/ml	↑ nitric oxide production, ↓ viral replication and cell signaling pathways	(Banerjee 2023)
<i>Olea europaea</i>	Oleanolic acid, ursolic acid, quercetin, phenol	Methanol, distilled water	SARS-COV-2	10.6 µg/ml, 100 µmol/L	↓ viral replication, ↓ TNF-α production, ↓ platelet aggregation	(Abdelgawad 2022)
<i>Zingiber officinale</i>	Gingerol, shogoal, α-curcumene, borneol	Methanol, water	P.aeruginosa	10 µg/mL	↓ biofilms development, ↓ efflux movement, ↓ bacterial load, ↓ lungs inflammation	(Chakotiya 2018)
<i>Mentha piperita</i>	Menthol, menthone, isomenthone, pulegone	Ethanol, methanol, chloroform, hexane	B.subtilis, S.pneumoni a, S.aureus, E. coli	50 µl - 100 µl	Ethyl acetate ↑ antibacterial activity	(Sujan a 2013)

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