

Original Research

## Evaluation of Adjunctive Homoeopathy Treatment in COVID-19 Hospitalised Patients at the Gujarat State's Dedicated COVID-19 Hospitals and Covid-Care Clinics During the First Wave of COVID-19 Pandemic: A Multicentric, Single-Arm Retrospective Data Analysis Study

Deepti Singh Chalia <sup>1,\*</sup>, Anil Khurana <sup>2</sup>, Mehul Trivedi <sup>3</sup>, Pinakin Trivedi <sup>4</sup>, Sarita Gola <sup>1</sup>, Parul Singh <sup>1</sup>

1. Department of Clinical Research, Central Council for Research in Homoeopathy, Ministry of AYUSH, Govt of India, 61-65, Institutional Area, 110058, Janakpuri, New Delhi, India; E-Mails: [dr.deepti.2821@gmail.com](mailto:dr.deepti.2821@gmail.com); [golasarita@gmail.com](mailto:golasarita@gmail.com); [drparul35@gmail.com](mailto:drparul35@gmail.com)
2. Former Director General, Central Council for Research in Homoeopathy, Chairperson, National Commission for Homoeopathy, Govt. of India, 61-65, Institutional Area, 110058, Janakpuri, New Delhi, India; E-Mail: [anilnaman@rediffmail.com](mailto:anilnaman@rediffmail.com)
3. Government Homoeopathic Medical College, Dethali, Siddhpur, Dist. Patan-384151, Gujarat, India; E-Mail: [drmctrivedi\\_7479@yahoo.co.in](mailto:drmctrivedi_7479@yahoo.co.in)
4. President, Board of Ethics and Registration for Homoeopathy, National Commission of Homoeopathy, Govt of India, 61-65, Institutional Area, 110058, Janakpuri, New Delhi, India; E-Mail: [drptrivedi@hotmail.com](mailto:drptrivedi@hotmail.com)

\* **Correspondence:** Deepti Singh Chalia; E-Mail: [dr.deepti.2821@gmail.com](mailto:dr.deepti.2821@gmail.com)

**Academic Editor:** Bernard Poitevin

**Special Issue:** [Homeopathy](#)

*OBM Integrative and Complementary Medicine*  
2023, volume 8, issue 2  
doi:10.21926/obm.icm.2302025

**Received:** February 20, 2023

**Accepted:** June 11, 2023

**Published:** June 28, 2023

### Abstract

This retrospective data analysis study aims to analyze the data collected during adjunctive homeopathy treatment of COVID-19 patients by the Homoeopathic medical officers (HMO) in Gujarat state-dedicated COVID-19 hospitals (DCH) during the first wave of the pandemic. The HMOs used the standard data collection forms/sheets to record each patient's demographic information, clinical symptoms, homoeopathic management, and outcome data. Data of all



© 2023 by the author. This is an open access article distributed under the conditions of the [Creative Commons by Attribution License](#), which permits unrestricted use, distribution, and reproduction in any medium or format, provided the original work is correctly cited.

cases hospitalized with COVID-19 of any age, and both genders were included, and entries with missing values or incomplete/ incorrect information were excluded from the analysis. The outcome measure is the recovery duration, time to clinical improvement, worsening symptoms, and indicated homeopathic medicines. Data from 2581 cases analyzed showed clinical recovery time after adjunctive homeopathy as 05 days (IQR: 3-7); the Mean was 5.19 days (SD:4.62), with 80% of patients (2063 out of 2581) discharged between 0-7 days out of which more than 20.4% patients (419 out of 2063) having at least one of the comorbidities. Only 03 deaths of male patients above 50 years with comorbidities and 67 cases (2.6%) with worsening symptoms were reported. The homeopathic medicines used were *Arsenic album* in 73.0% and *Bryonia alba* in 17.6% of cases. Adjunctive Homoeopathy and standard care in COVID-19 patients had a promising role in the early relief of clinical symptoms and less progression into severity in the risk group of elderly patients with comorbidities. There were no reported adverse effects of taking the adjunctive Homoeopathy, making it a potential choice for integrated use in managing COVID-19 patients.

### Keywords

Arsenic album; COVID-19; comorbidities; Gujarat; Homoeopathy; retrospective

## 1. Background

Since the outbreak of a novel coronavirus (SARS-CoV-2) at the end of 2019, there has been significant morbidity and mortality worldwide. Coronavirus disease 2019 (COVID-19) continues to affect thousands of individuals as it not only infects the respiratory tract but the ensuing viral replication and immune response also affect other organs, which can lead to a risk of heart, renal, and liver injury in addition to an acute systemic inflammatory response and accompanying shock [1]. Early seeking medical care by people with exposure and symptoms, especially the most vulnerable, could substantially reduce the spread of infection, severity, and fatality due to this disease and produce a better clinical outcome [2].

During the first wave, therapeutic strategies to deal with COVID-19 were only supportive, focusing more on preventive efforts to reduce transmission in the community [3]. World Health Organization (WHO) reported that some Western, traditional, or home remedies might provide comfort and alleviate symptoms of mild COVID-19 [4]. Several published articles on the integrative approach of modern and traditional Chinese medicine (TCM) have shown encouraging outcomes [5]. Simple and safe remedies from AYUSH systems [6] were widely used in India. It is reported that during the initial phase, the cases presenting as mild can be controlled, so they may not progress to severity [7]. The strengths and benefits of traditional systems like Homoeopathy must be evaluated and used to combat this disease. Historically, Homoeopathy has gained tremendous popularity by contributing to the prevention and treatment of some epidemic and pandemic diseases like Spanish flu [8], cholera, yellow fever, swine flu [9, 10], etc. There are clinical studies undertaken with Homoeopathy as an adjunctive to usual care in Dengue [11], Acute encephalitis syndrome [12] indicating a beneficial role.

Gujarat, a state along the western coast of India, reported its first two cases on March 19, 2020. By the first half of April 2020, the COVID-19 cases were doubling in 3 to 4 days, and Gujarat became the second major hotspot in the country during the first wave [13]. The state government established dedicated COVID-19 hospitals and care centers, ensuring every district had at least one hospital to treat COVID-19-affected patients. Appropriate utilization of AYUSH doctors (trained to offer COVID-19 care through the government of India's online platform <https://igot.gov.in>) during this pandemic ensured that the health system was not burdened, and the benefits of different alternative streams could also be used. However, with all the measures in place, Gujarat had the highest burden of COVID-19, especially in districts like Ahmedabad, Surat, and Vadodara [14].

The Ministry of Ayush, Government of India, released an advisory for using homeopathic medicines to prophylaxis and management COVID-19 [15]. The state of Gujarat was the first to adopt this and, through its AYUSH Department, allowed the use of Homoeopathy in an integrated manner as an adjunctive to standard care for hospitalized COVID-19 patients of mild to moderate categories [16]. Therefore, this study aimed to retrospectively analyze the clinical data of hospitalized COVID-19 patients receiving adjunctive homeopathy treatment in dedicated COVID-19 Hospitals (DCH) and Covid-19 Care Centres (CCC) during the first wave of the COVID-19 pandemic in Gujarat, India.

## **2. Material and Methods**

### **2.1 Study Design**

This was a retrospective data analysis study designed to evaluate the effect of Adjunctive Homoeopathy in hospitalized COVID-19 patients at COVID-19 treatment Centres of Gujarat State using the data collected during the treatment.

### **2.2 Study Population**

COVID-19-positive patients, as confirmed using RT-PCR or Rapid Antigen test with mild to moderate severity defined as per the COVID-19 guidelines issued by the Ministry of Health and family welfare of disease severity, undertaking adjunctive Homoeopathy along with the standard of care of allopathy treatment in the DCH and CCC in the State.

### **2.3 Inclusion Criteria**

Patients of any age or gender with a confirmed diagnosis of COVID-19 (through RT-PCR or Rapid Antigen test, based on the State guidelines of testing) or probable/suspected and admitted at the DCH and CCC of Asymptomatic, mild to moderate severity at the time of admission were included in the study. The admitted patients also provided written consent to receive the adjunctive Homoeopathy medicine and to use the data for analysis.

### **2.4 Exclusion Criteria**

The cases with missed and incomplete/ incorrect information were excluded from the analysis. The patients under the severe clinical category admitted to ICU were not given adjunctive Homoeopathy medicines.

## **2.5 Study Locations**

The State AYUSH department deputed homeopathic medical officers to district Civil Hospitals designated as DCH and special CCC.

Dedicated COVID-19 Centers in Gujarat from where the data was received were 1200 Bed COVID-19 Care Civil Hospital; General Hospital, Bharuch; Sir Takhatsinhji Government Hospital, Bhavnagar; GMERS Civil Hospital, Gandhinagar; Civil Hospital, Surat; General Hospital, Jamkhambhaliya, Devbhumi Dwarka; General Hospital, Vyara; GMERS Hospital, Gotri; SAMRAS COVID-19 Care Centre; Sola Civil Hospital; Sardar Vallabhbhai Patel Institute of Medical Sciences and Research (SVPIMSR); Surat Municipal Institute of Medical Education & Research (SMIMER); Pandit Deen Dayal Upadhyay Medical College, Rajkot; Civil Hospital, Kheda.

## **2.6 Testing Guidelines**

The suspected patients were tested following the state government guidelines based on the Indian Council of Medical Research (ICMR's) strategy for COVID-19 testing in India [17].

## **2.7 Discharge Policy**

The state government discharge policy during the reported time was followed for the patients. The patients who were fever-free, clinically stable for 48 hours, and did not require Oxygen support were discharged and kept under home isolation with daily surveillance from health workers. Those released may watch for warning signals and should report to designated hospitals in case of positive warning signals.

## **2.8 Adjunctive Homoeopathy Guidelines**

Ministry of Ayush published useful guidelines for qualified Homoeopathic practitioners to manage the COVID-19 pandemic [18]. The Homoeopathic physician prescribed the homeopathic medicines in 30 CH/200 CH/1M potency based on the symptom totality following the Homoeopathic principles [19]. The AYUSH department provided a list of commonly indicated homeopathic medicines as a quick reference guide [16]. Medications were continued until the patient was discharged.

## **2.9 Ethical Approval**

Patients were briefed about the possible role of Homoeopathy medicines in disease management, and written consent was taken to record the data and use it anonymously for analysis. The current retrospective data analysis was approved by the Central Ethical Committee of the Central Council for Research in Homoeopathy, Ministry of Ayush, Government of India, vide 1-3/2019-2020/24.05(s)/Dt25.8.2020.

## **2.10 Study Procedures and Outcomes**

In this study, we retrospectively reviewed and collected information on hospitalized patients with COVID-19 who have received adjunctive homeopathy treatment by Homeopathic medical officers and standard medical care at Gujarat state's DCH and CCC.

The primary outcome was the duration of clinical recovery, i.e., relief of symptoms after taking adjunctive homeopathy. The clinical recovery was also evaluated in high-risk patients, i.e., cases with comorbidities and above 60 years of age. Secondary outcomes were determining the clinical characteristics of the patients who have received adjunctive Homoeopathy, Clinical course of specific symptoms, Symptom worsening or Progression into complications and most prescribed homeopathic medicines.

### **2.11 Study Period**

The study's time frame was not pre-determined, and this retrospective analysis represents the data of patients received between May-December 2020. The data of time, mid-July-December 2020, was found to be appropriately captured. Thus, it was used for the analysis.

### **2.12 Data Sources**

The standardized Excel sheet and Homoeopathic COVID-19 case record form developed in line with the WHO COVID-19 case records form were used by the Homoeopathic Medical officer (HMO) to record the demographic information, clinical symptoms, homeopathic management, and outcome data from each patient, which was saved with AYUSH directorate office, Health Department, Gujarat State Government and were sourced retrospectively for the analysis.

The data was scrutinized for missing values, duplicate entries, and typographical mistakes, especially in the date format. Quality information was checked at the second level by random checking for calibration and consistency. Further, in case of any conflicting data, the treating physicians, i.e., Homoeopathic Medical officers, were interviewed, and issues were resolved. The final data included demographic features, history of exposure, pre-existing co-morbidities, homeopathic management, and outcome.

The clinical categories have been defined as per the COVID-19 guidelines issued by the Ministry of Health and family welfare [20] of disease severity as mild for cases having any symptoms (fever, cough, sore throat, nasal congestion, malaise, headache) with no evidence of breathlessness or hypoxia; moderate with the presence of clinical features of dyspnoea and or hypoxia, cough, fever including SpO<sub>2</sub> between 90 to 94% on room air, a respiratory rate more than or equals to 24 per minutes; Severe with clinical signs of Pneumonia including respiratory rate >30 breaths/min, severe respiratory distress, SpO<sub>2</sub> <90% on room air.

### **2.13 Data Variables and Outcome Parameters**

Clinical recovery was defined as relief from COVID-19-related symptoms and discharge from the hospital. We described the recovery time for adjunctive Homoeopathy from the start of adjunctive Homoeopathy to clinical recovery and discharge. The patients' outcome concerning release from the hospital or recovery, transfer/migration to other COVID-19 centers and Death was captured and used to evaluate the cases.

### **2.14 Statistical Analysis**

As the data is retrospective, comprising cases that received adjunctive Homoeopathy only with no control group or data of the patients who did not receive adjunctive Homeopathy, only

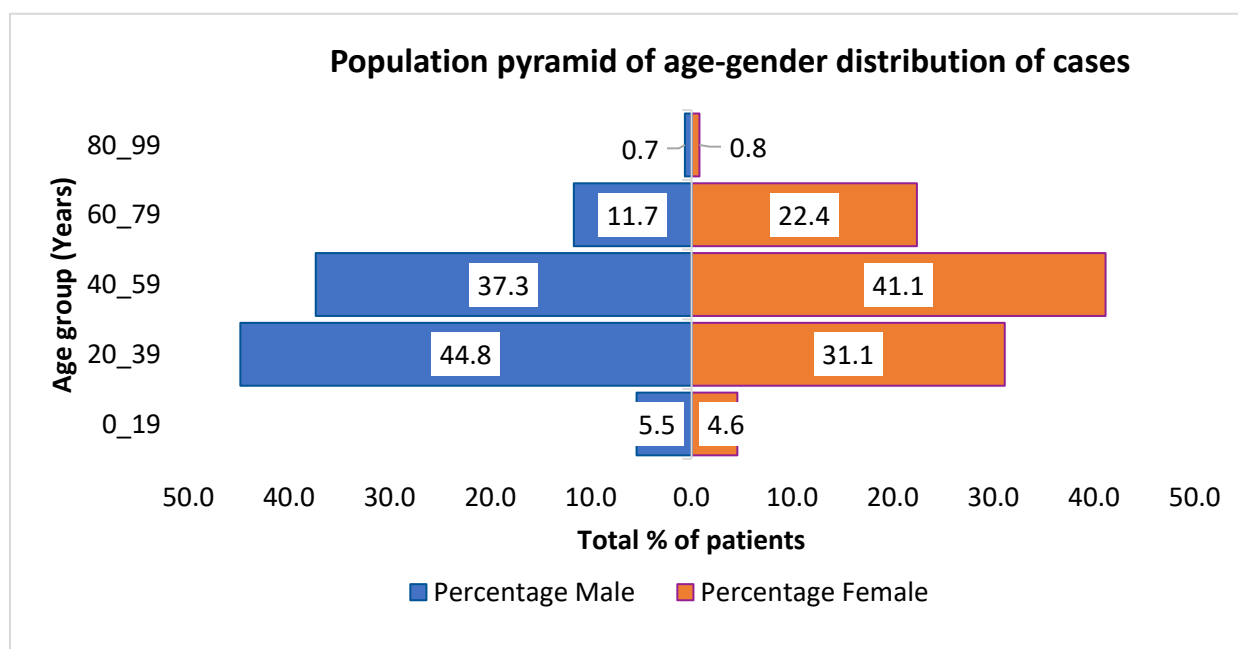
descriptive statistics can be used for the analysis and data presentation. Depending on the data distribution, the categorical variables were described as frequency rates and percentages, and continuous variables were defined with mean, standard deviation or median, and interquartile range values. Kaplan- Meier estimates were used to examine the median time to relieve symptoms/ clinical improvement. Proportions for Categorical variables were analyzed using the chi-squared test. Logistic regression analysis was applied wherever appropriate. Analysis was performed using SPSS statistics (IBM et al.) and Microsoft Excel for graphs & charts.

### 3. Result

Information on 6868 COVID-19 patients was collected from Gujarat state DCH and CCC between May 2020 and December 2020. Although the number of patients who have received adjunctive homeopathic treatment could be more than this, the data might not have been listed due to limited resources and management. For accurate analysis, the data of 4287 (62.4%) patients were excluded due to lack of discharge date and date of discontinuation of Homoeopathic medicine, missing information about symptoms relieved or worsened and suspected and non-confirmed cases. Finally, the data of 2581 (37.6 %) patients were analyzed from mid-July-December 2020 only.

#### 3.1 Patients' Characteristics

The median age of patients in the study was 41 years (interquartile range IQR, 29:53 years). The youngest patients were two infants 11 months of age hospitalized with their family members under the asymptomatic category. And the maximum age of the patient in the study was 89 years. The risk group population, i.e., over 60 years old, was 15.6%. Of 2581 cases, 1813 (70.2%) were male, and 768 (29.7%) were female (Figure 1).

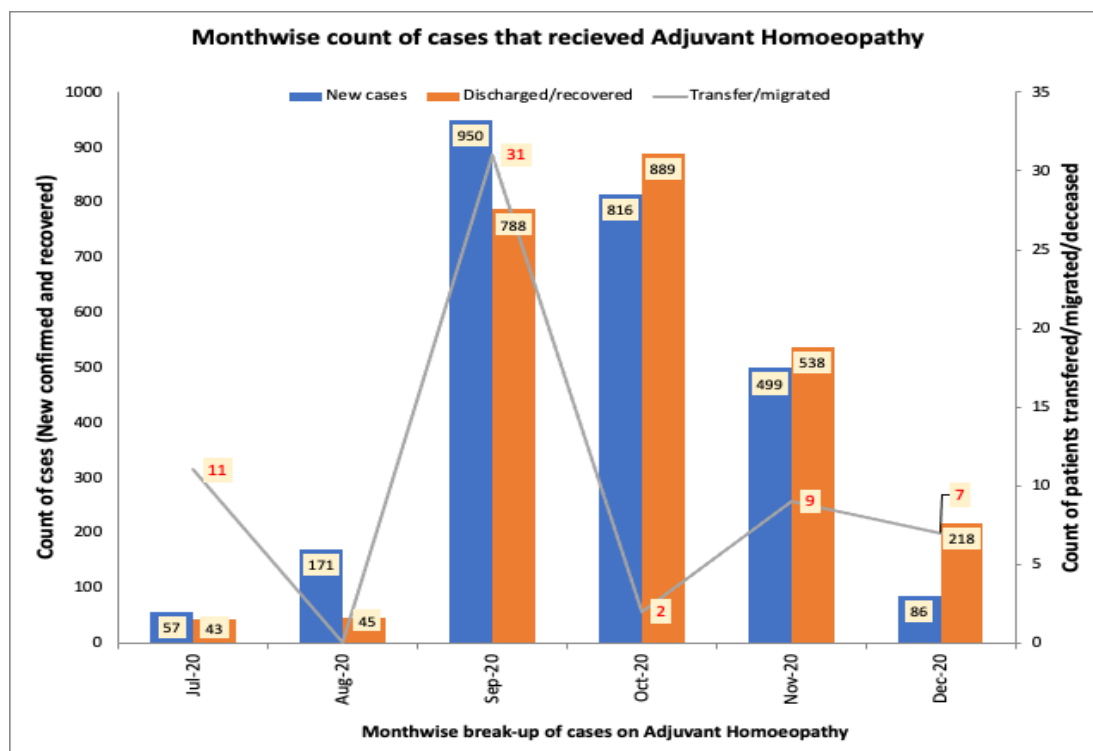


**Figure 1** Population pyramid of age-gender distribution of cases received Adjunctive homoeopathy.

The presence of any comorbidity or history of a pre-existing condition was reported in 20.7% (533/2581) cases, with a significantly higher proportion of patients in the age group 40-89 years. The most common comorbidity among the hospitalized COVID-19 patients was Hypertension (12.6%) and Diabetes Mellitus (9.4%); 4.3% had other conditions like Anaemia, COPD/Asthma, cardiac diseases other than hypertension, Dyslipidaemia, Thyroid diseases, etc. The demographic and clinical characteristics of the patients/subjects are presented in Table 1, and the month-wise break-up of cases that received adjunctive Homoeopathy is illustrated in Figure 2.

**Table 1** Demographics and patients characteristics.

Characteristics	N (N%)
Age in years, median	41 years (IQR: 29,53)
	0-19 134 (5%)
	20-39 1052 (41%)
Age groups, n (%)	40-59 993 (38%)
	60-79 384 (15%)
	80-99 18 (1%)
Sex	
Male	1813 (70%)
Female	768 (30%)
Pre-existing conditions/ Co-morbidities	
No	2048 (79.3%)
Yes	533 (20.7%)
Hypertension	325 (12.6%)
Diabetes Mellitus	242 (9.4%)
Chronic Kidney Diseases	6 (0.2%)
Thyroid Diseases	15 (0.6%)
Cardiac Diseases	24 (0.9%)
Smoking	5 (0.2%)
Other (Anaemia, Cancer, Dyslipidaemia, etc.)	160 (2.3%)
Clinical Category	
Asymptomatic	294 (11.4%)
Mild	2201 (85.2%)
Moderate	81 (3.1%)
Severe	5 (0.2%)
Outcome	
Discharged/Recovered	2521 (97.68%)
Transfer/Migrated	57 (2.21%)
Death/Deceased	3 (0.12%)



**Figure 2** Month-wise count of new confirmed, recovered and transferred/migrated case.

Out of the total 2581 patients, the majority, i.e., 1498 (58.0%), were in the middle age group 30-59 years, followed by the younger age group of 0-29 years (681, 26.4%) and 402 (15.6%) patients were the high-risk elderly population of 60 years and above. There was no significant association between the age group of patients and their respective outcomes ( $p = 0.437$ ) (Table 2). However, the age group was significantly associated with the clinical category of the patients. Most mild cases (1328 out of 2581, 60.3%) were middle-aged, between 30-59 years old. The proportions of moderate patients in age groups 0-29 years, 30-59 years and 60 years & above were 16.0%, 64.2% and 19.8%, respectively (Compared using the Chi-square test,  $p < 0.001$ ) (Table 3).

**Table 2** Age-wise Outcome of the patients.

Age group (years)	N	Outcome of Patients			P-value
		Recovered/Discharged	Transferred	Death	
0-19	134	132	2	0	0.437
20-39	1052	1026	26	0	
40-59	993	971	21	1	
60-79	384	374	8	2	
80-99	18	18	0	0	
Total	2581	2521 (97.7%)	57 (2.2%)	3 (0.1%)	



**Table 3** Age-wise distribution of cases under the clinical category.

Age (years)	N	Clinical Category				P <
		Asymptomatic	Mild	Moderate	Severe	
0-29	681	150	518	13	0	0.001*
30-59	1498	117	1328	52	1	
60-79	402	27	355	16	4	
<b>Total</b>	<b>2521</b>	<b>294 (11.4%)</b>	<b>2201 (85.3%)</b>	<b>81 (3.1%)</b>	<b>5 (0.2%)</b>	

\*Compared using the Chi-Square test

### 3.2 Clinical Symptoms at Presentation

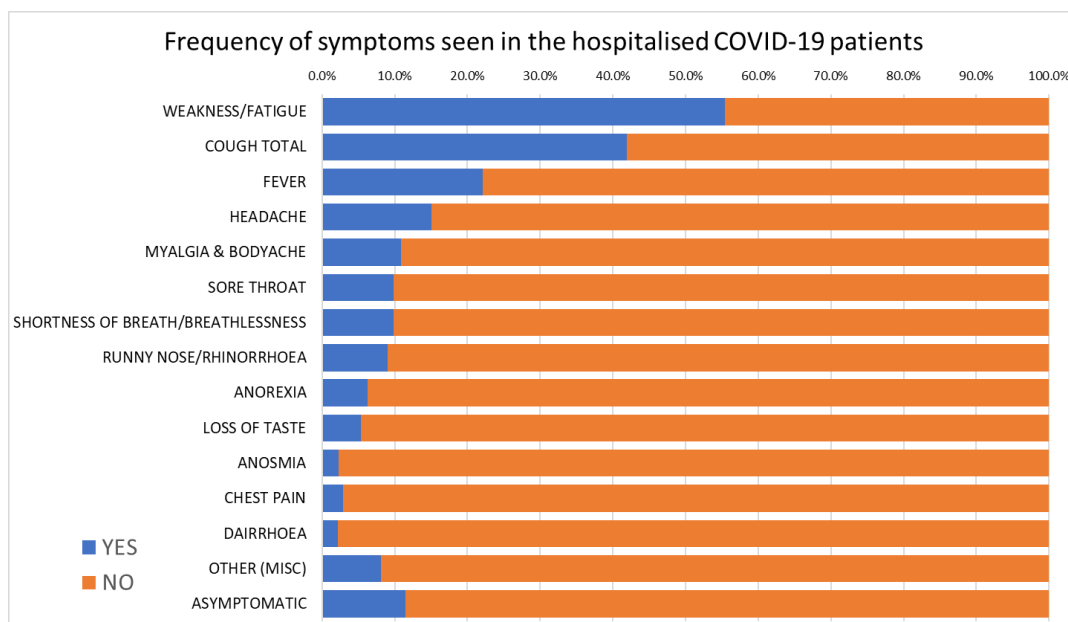
The symptomatic presentation of COVID-19 on the day of hospitalization was found in 88.6% of patients in the current data, out of which 33.6% (866/2581) patients presented with only one clinical symptom and 22.7% (585/2581) reported two symptoms. The remaining 17.1% (442/2581) presented with 3 and 15.3% (394/2581) with four and more symptoms. The difference by age is highly significant ( $p < 0.001$ , compared using the Chi-square test) for the total number of clinical signs present in the hospitalized patients, i.e., more cases in the younger age group are asymptomatic. At the same time, the elderly population had a more significant number of clinical symptoms (Table 4).

**Table 4** Age-wise distribution of cases by the number of symptoms.

Age group (years)	N = 2581	Number of Clinical Symptoms					p-value
		0 (n = 294)	1 (n = 866)	2 (n = 585)	3 (n = 442)	4& more (n = 394)	
0-19	134 (5.2%)	41 (13.9%)	55 (6.4%)	18 (3.1%)	10 (2.3%)	10 (2.5%)	< 0.001*
20-39	1052 (40.8%)	161 (54.8%)	337 (38.9%)	245 (41.9%)	166 (37.6%)	143 (36.3%)	
40-59	993 (38.5%)	65 (22.1%)	324 (37.4%)	234 (40.0%)	192 (43.4%)	178 (45.2%)	
60-79	384 (14.9%)	26 (8.8%)	143 (16.5%)	85 (14.5%)	71 (16.1%)	59 (15.0%)	
80-99	18 (0.7%)	1 (0.3%)	7 (0.8%)	3 (0.5%)	3 (0.7%)	4 (1.10%)	

\*Compared using the chi-square test

Under the type of symptoms, the most common was weakness/fatigue, reported by 55.4% of patients (Figure 3), while 41.9% reported Cough, out of which dry cough was reported by 18.0% and productive cough by 12.4%. Fever was reported in around 22.1% of patients, followed by headache in 15.1%. Myalgia/body ache in 10.9%, sore throat and shortness of breath/dyspnoea in 9.8%, runny nose/rhinorrhoea in 9.0%, anorexia in 6.2%, loss of taste in 5.4%, chest pain in 2.9%, anosmia in 2.3% patients. Other complaints like diarrhea, chills, nausea & vomiting, anxiety, etc., reported by 10.2% of patients were grouped as miscellaneous.



**Figure 3** Frequency of symptoms seen in hospitalised patients who received adjunctive homoeopathy treatment.

### 3.3 Duration of Recovery/Improvement of Clinical Symptoms of COVID-19

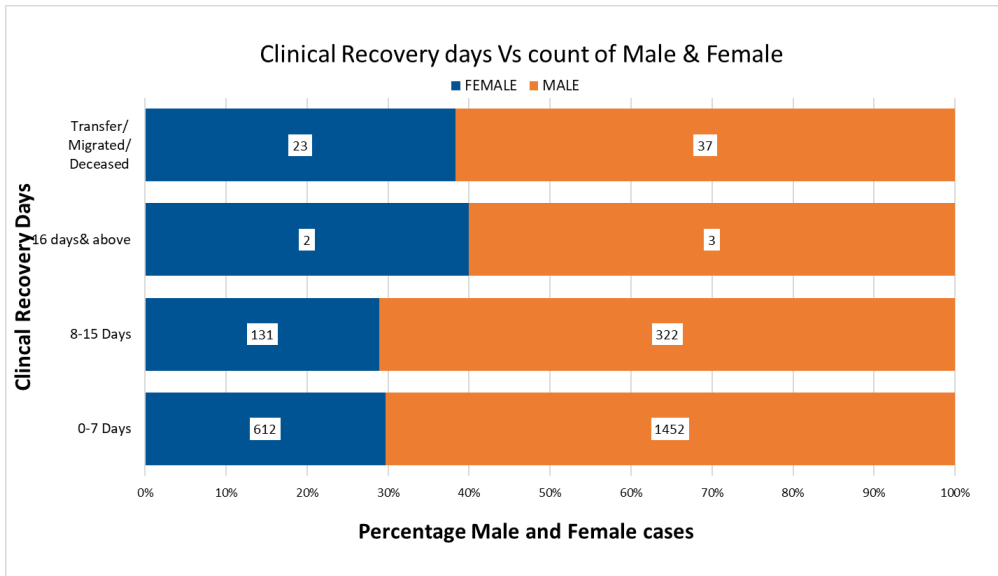
The study’s primary outcome is the duration of relief of symptoms of COVID-19 or time to clinical improvement and discharge of the patients. It was found that the overall time to clinical improvement after adjunctive Homoeopathy treatment was five days, interquartile range of 3:7 days. The summary of the duration of relief of symptoms/clinical recovery of 2521 cases out of 2581 is detailed in Table 5 (Age and Sex), 6 (Clinical Category) & 7 (High-Risk group) and Figure 4, Figure 5 & Figure 6 (Comorbidities).

**Table 5** Clinical Recovery Days of COVID-19 concerning Sex and Age of the Recovered Patients.

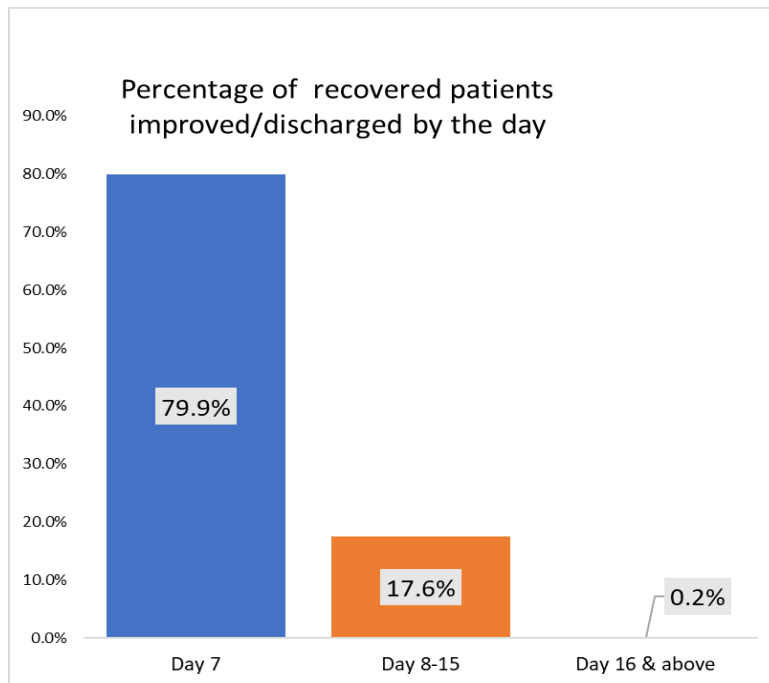
	N	Mean (In days)	Std. Error	Std. Deviation	95% Confidence Interval		P-value
					Lower	Upper	
<b>Sex</b>							
Male	1776	5.27	0.063	2.667	5.15	5.40	P = 0.010*
Female	745	4.99	0.102	2.787	4.79	5.19	
<b>Age</b>							
Young (0-29 years)	663	5.19	0.096	2.46	5.00	5.38	P = 0.108#
Middle Aged (30-59 years)	1466	5.12	0.071	2.72	4.98	5.26	
Elderly (60-99 years)	391	5.44	0.153	3.03	5.14	5.74	

**Total recovered patients**      **2521**   **5.19**      **0.054**   **2.71**      **5.08**      **5.29**

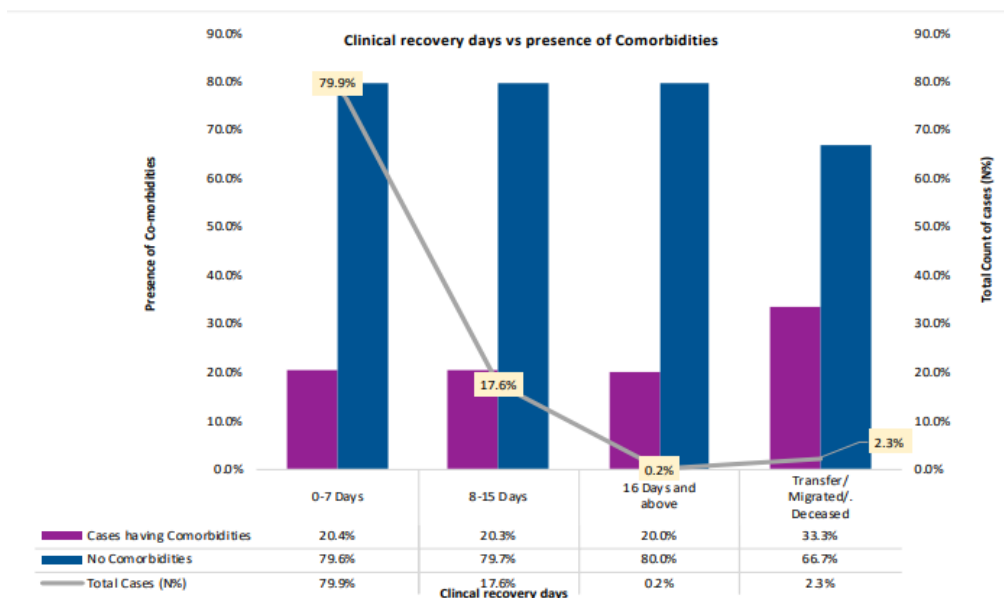
\*Compared using Independent T-Test; #Compared using One-way Anova



**Figure 4** Clinical recovery days for count of male and female patients.



**Figure 5** Percentage of recovered patients improved/discharged by day.



**Figure 6** Clinical Recovery Vs presence of Comorbidities.

The majority of recovered patients, i.e., 81.8% (2063 out of 2521), had a duration of relief between 0-7 days following the start of adjunctive homeopathy medicine (Figure 5), among which the proportion of patients under the mild category was significantly higher, 85.12% (2146/2521). Further, recovery duration is significantly associated with a category of severity (since it is statistically significant < 0.001 using the chi-square test) (Table 6).

**Table 6** Recovery duration vs clinical category of the recovered/discharged patients.

Recovery duration	N (N%)	CATEGORY				P-value
		Asymptomatic	Mild	Moderate	Severe	
0-7 days	2063 (81.8%)	255 (87.0%)	1743 (81.2%)	65 (80.2%)	0 (0%)	<0.001 *
8-15 days	453 (18.0%)	37 (12.6%)	401 (18.7%)	14 (17.3%)	1 (100.0%)	
16 and more days	5 (0.2%)	1 (0.3%)	2 (0.1%)	2 (2.5%)	0 (0.0%)	
<b>Total Recovered</b>	<b>2521</b>	<b>293</b>	<b>2146</b>	<b>81</b>	<b>1</b>	

\*Compared using the Chi-Square test

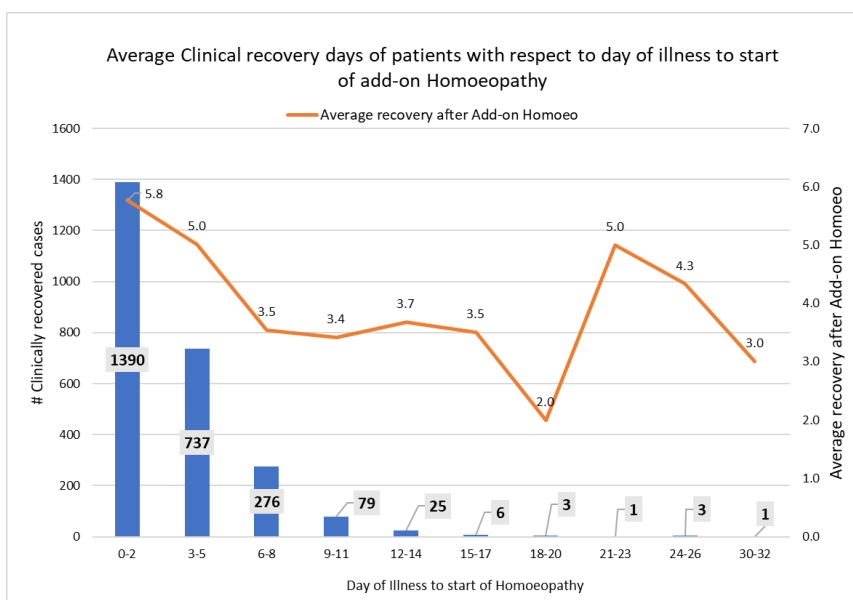
There was a statistically significant association between the age group of the patients and time to clinical improvement (p < 0.001), with 76.5% of the high-risk elderly age group getting relieved and discharged within 0-7 days. The young and adult population fared better, with almost 83% of cases below 60 years of age having clinical recovery between 0-7 days with adjunctive homeopathy (Table 7). Further, it was also found that from 2063 patients relieved within 0-7 days of adjunctive Homoeopathy, 420 (20.4%) patients had comorbidities (Figure 6).

**Table 7** Recovery Duration in the High-risk Age Group of the Recovered/Discharged Patients.

Recovery Days	Total	Age group		P-value
		Less than 60 years	More than 60 years	
0-7	2063 (81.8%)	1763 (82.8%)	300 (76.5%)	P < 0.006*
8-15	453 (18.0%)	361 (17.0%)	92 (23.5%)	
16 and more	5 (0.2%)	5 (0.2%)	0 (0.0%)	
<b>Total</b>	<b>2521</b>	<b>2129</b>	<b>392</b>	

### 3.3.1 Clinical Recovery to the Day of Illness to Start of Adjunctive Homoeopathy

The recovered cases with assessed from the day of illness, i.e., from the date of confirmation to the start of adjunctive homeopathy and average days of clinical recovery. More than half of patients, i.e., 1390 out of 2521 recovered patients, were administered adjunctive Homoeopathy within 0-2 days of illness, with an average recovery duration of 5.8 days. The breakup of the count of clinically recovered cases from the day of sickness and their respective average is presented in the chart Figure 7.



**Figure 7** Average clinical recovery days of patients.

Our study found lower mortality in patients with adjunctive Homoeopathy, with only 03 deaths reported. Still, the cohort of patients includes mainly pre-symptomatic, mild to moderate cases. However, it can be seen that even in 21% of patients with comorbidities, the rate of progression to any clinical complications or severity was still low, i.e., 4.0% with the outcome, i.e., recovery/ discharge of these patients not found to be associated with the presence of comorbidities. (Statistically insignificant  $p > 0.05$  using Chi-Square test).

### 3.3.2 Comparison with Outcome of General Population

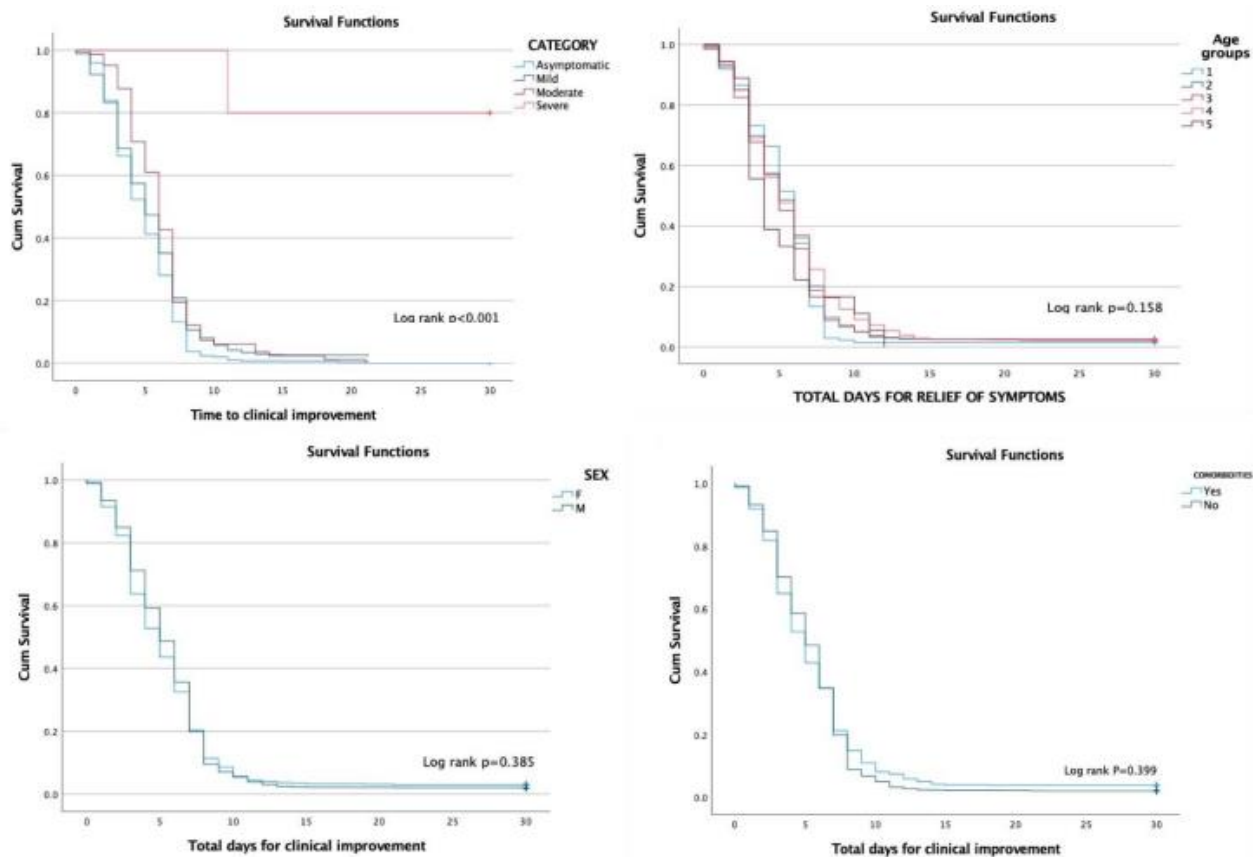
It is known from studies that have assessed the recovery of COVID-19 cases based on the community-level data by N George *et al.* 2021 that Gujarat had a recovery of 9 days (CI = 6.16–9.52). Based on this population estimate, the clinical recovery of the patients in this data was compared using the one-sample T-test method, which was found to be statistically significant (Table 8).

**Table 8** The population estimates the clinical recovery of the patients compared to the current data.

One-Sample Test									
Test Value = 9									
	N	Mean (days)	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		Mean Difference	t	P-value
					Lower	Upper			
Total Days for Relief of Symptoms	2521	5.19	2.706	0.054	-3.92	-3.71	3.815	-70.786	P=0.000

### 3.4 Time to Clinical Improvement Probability

The probability of time to outcome or event, i.e., clinical improvement or recovery, was estimated using the Kaplan-Meier method, and differences in time to clinical recovery due to factors like age, sex, presence of comorbidities and the clinical category were compared using the log-rank test and Cox proportional hazard regression models. The survival curves from the KM estimator for Sex (male and female), age group, and presence of comorbidities were almost the same, with the Log Rank test (Mantel-cox) having non-significant results of  $p = 0.385$ ,  $p = 0.399$  and  $p = 0.158$  respectively (Figure 8). The adjunctive homeopathy treatment has no remarkable statistical difference in terms of the patient’s age, sex, or presence of any co-morbidity, thereby indicating potential benefits across all the patients presenting with COVID-19.



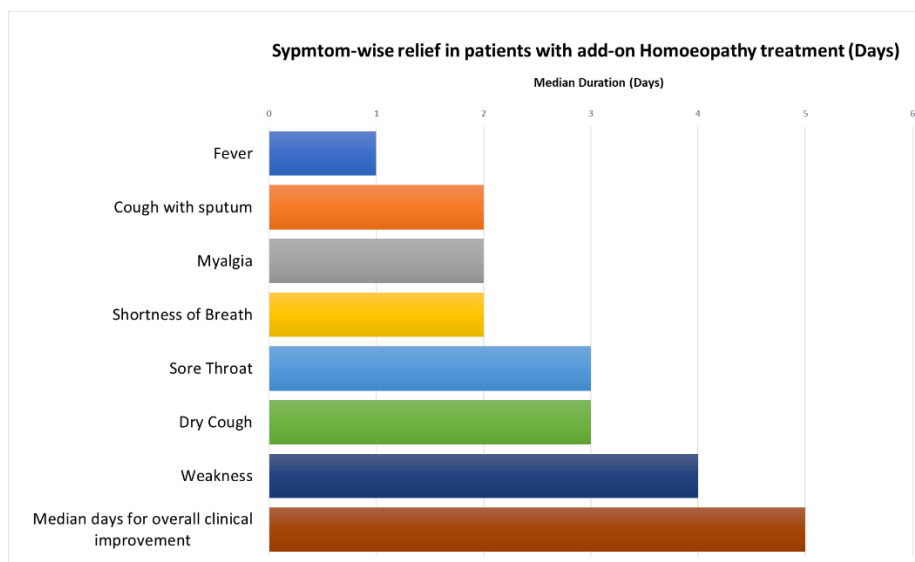
**Figure 8** Kaplan-Meier graphs showing the probability of time to clinical improvement (event) due to factors: clinical category, Age group, Gender, and Comorbidities.

There were statistically significant results found in survival estimates for the event (Clinical recovery) in association with the clinical category only.

Cox proportional hazard regression model was also used to identify predictors of cumulative survival with age ( $\geq 60$  years versus below), gender, and presence of comorbidities (overall or hypertension, diabetes, chronic lung disease) as Covariates. It found no significant association of factors age, gender and company of comorbidities in time to clinical improvement.

### 3.5 The Clinical Course of Specific Symptoms

We found that recipients of Adjunctive Homoeopathy in this study had the shortest time to clinical improvement for fever, with a median of one day (IQR, 1.0-2.0 days, 95%CI), followed by cough with sputum in Median 2 days (IQR, 2.0-4.0 days, 95% CI), Myalgia in median two days (IQR 1.0-3.0 days), shortness of breath in median two days (IQR, 2.0-4.0 days, 95%CI), sore throat in median three days (IQR, 2.0-6.0 days, 95%CI), dry cough in 3days (IQR, 2.0-5.0 days) and weakness which lasted longer for four days (IQR, 2.0-7.0 days) (Figure 9).



**Figure 9** Median duration of relief of specific symptoms (days).

### 3.6 Symptoms Worsening or Progression into Complications

In this study, the clinical progression of 96.6% of COVID-19 hospitalized cases remained in the mild/asymptomatic category. Of 2581 cases, the worsening of symptoms was reported only in 67 points, i.e., in around 2.6%. Of these 67 patients, nine (09) were discharged even after reporting clinical worsening symptoms, 55 were transferred, and three died.

### 3.7 Frequently Prescribed Homoeopathic Medicines

In this study, we found that the most indicated medicines were *Arsenic Album* at 73.0%, *Bryonia Alba* at 17.6%, *Belladonna* at 1.5%, *Allium Cepa* at 1.6%, *Gelsemium* at 1.4%, *Pulsatilla* in 1.2%, and other medicine like *Phosphorus Rhus tox*, *Merc sol*, *Sulphur*, etc. in 3.5% of cases. The homeopathic medical officers prescribed the medication based on the symptoms and clinical presentation in 30CH, 200CH and 1M potencies, with 30CH being the most common potency. The frequency of homeopathic medicine used is described in Table 9. The homeopathic medicine *Arsenic album* 30 was found to be significantly associated with early clinical improvement and discharge as the outcome ( $p < 0.001$ ), as compared using the Chi-square test (see Table 9).

**Table 9** Frequency of Homoeopathic medicines prescribed (to indicate the group of most prescribed medicines) Vs time to improvement.

Homoeopathy Medicine (Potency)	Time to Improvement (days)				Total N (N%)	P-value
	0-7 N (N%)	8-15 N (N%)	16-23 N (N%)	Transfer/death N (N%)		
Arsenic album (30, 200)	1498 (72.6%)	354 (78.1%)	3 (60.0%)	28 (46.7%)	1883 (73.0%)	$p < 0.001^*$
Bryonia alba (30, 200, 1M)	351 (17.0%)	72 (15.0%)	1 (20.0%)	18 (30.0%)	442 (17.1%)	



Belladonna (30, 200)	35 (1.7%)	3 (0.7%)	0	2 (3.3%)	40 (1.5%)
Allium cepa (30, 200)	31 (1.5%)	9 (2.0%)	1 (20.0%)	0	41 (1.6%)
Pulsatilla (30, 200)	26 (1.3%)	4 (0.9%)	0	0	30 (1.2%)
Gelsemium (30, 200)	27 (1.3%)	5 (1.1%)	0	4 (6.7%)	36 (1.4%)
Other (s)	95 (4.6%)	6 (1.3%)	0	8 (13.3%)	109 (4.2%)
Total	2063 (100%)	453 (100%)	5	60 (100%)	2581 (100%)

\*Compared using the chi-square test

#### 4. Discussion

There are many studies on COVID-19 where epidemiological characteristics have been reported in the different setups of hospitals based on specific age groups or comorbid conditions [21-24]. Likewise, many studies have reported the treatment effect of various therapeutic agents like anti-viral/Favipiravir [25], Remdesivir [26] and steroids [27]. In India, where the overall recovery rate was higher than in many other countries, it is also known that various AYUSH therapies have been extensively used as a preventive or immunity booster and even utilized for treatment as an adjunctive. In a cross-sectional mobile application-based study, most respondents benefitted from using AYUSH measures. Homeopathic medicine Arsenic Album 30 CH was reported to be the most used prophylactic intervention by the public for maintaining health [28].

The State Government of Gujarat was the first to report the utilization of Ayurveda and Homoeopathy in preventative care. The Homoeopathy medicine *Arsenic album 30 CH* was given to more than 30 million quarantined populations within five months. [29, 30]. To our knowledge, this is the first study to evaluate the role of adjunctive Homoeopathy in COVID-19 hospitalized patients in a pragmatic set-up at a large scale. The patient's response to adjunctive homeopathy was encouraging, as most consented.

Further, our data highlighted the striking difference between males and females with a more significant number of male patients, which also corresponds to the findings of earlier studies [31, 32], that male patients are more likely to get worsening symptoms and have poorer outcomes due to more exposure and less adherence to the COVID-19 appropriate behavior. We found three deaths in our data were male patients above 50. It is reported that male patients should be admitted to the hospital early in the disease and given aggressive treatment to help reduce the morbidity and mortality associated with COVID-19. Like many studies, age contributes to disease progression and outcome. Previous studies have mentioned that older COVID-19 patients are at an increased risk of death [33]. In the high-risk patients in this data (i.e., >60 years with comorbidity) who took adjunctive homeopathy, out of 205 patients, only 06 cases reported progressing into severity or complication of some kind (02 death and 04 referrals).

Further, in coherence with the previous studies [34], our patients had a greater prevalence of two comorbidities, Hypertension (HT) (320/23%) and Diabetes Mellitus (DM) (239/17%), while the

majority had no comorbidity (2048/79.3%). Although it has been reported in earlier studies that patients with COPD [34], cardiovascular disease and hypertension were at higher risk of severe illness and ICU admission, in our study data, a smaller number of HT and DM cases progressed into any severity (i.e., 7.5%).

In our data, asymptomatic cases (i.e., 296; 11.5%) presented with one or two symptoms initially, were laboratory-confirmed, but did not have any of the critical COVID-19 symptoms during the hospitalization [35]. These cases also received adjunctive homeopathy treatment and did not develop any other symptoms during the hospitalization. We found that more patients of the younger age group were asymptomatic, while the elderly population had a more significant number of clinical signs at hospitalization.

Consistent with many prior epidemiological studies, around 54% of the patients in this study complained of weakness/fatigue followed by cough (dry in 23% and with sputum in 18%); Fever (i.e., those who were febrile on admission) present in nearly 22% of patients. In this data, the median duration of fever was one day (IQR 1.0-2.0 days) which is lesser than what is known from earlier studies which estimated the median duration of fever as ten days after the onset of symptoms [36]. Further, a systematic review identified Dyspnoea as the only symptom predictive of severe COVID-19 and ICU admission [34]. Our data had 9.8% (253/2581) cases reported to have dyspnoea/shortness of breath, which was relieved in a median duration of 02 days, out of which only 24 patients progressed from mild to moderate and severe category. Overall, the median days to clinical recovery after adjunctive Homoeopathy was five days, which is relatively less than other studies that estimated overall COVID-19 symptoms duration for a median of 10 days [36].

Meanwhile, some initial studies suggested the average recovery time of COVID-19 patients in India as 25 days (95% C.I. 16 days to 34 days) during the same time duration as our study period [37]. It stated that only 4% of the patients get cured after ten days of treatment. Another published study based on data from an open-source database, which represented the community data, concluded that Gujarat had an average recovery of 9 days (CI = 76.16–9.52) [38]. However, it is encouraging to observe that based on our data, the time to clinical recovery with adjunctive homeopathy is relatively less compared to these studies. Several promising reports show the beneficial role of adjunctive Homoeopathy in treating COVID-19 patients [39, 40]. A recently published study also highlighted that the time to recovery was less in a group with standard COVID-19 care along with Adjuvant Homoeopathy [41]. Additionally, studies in-vitro and clinical studies to assess the immunomodulatory and therapeutic effects of Homoeopathic medicines in COVID-19 [42, 43] are undergoing results which will help us to understand the mechanism of action of Homoeopathic medicines on pathological cascades of COVID-19.

There is not much difference in time to event, i.e., recovery of symptoms in this study as indicated by the survival curves of male and female, age group or presence of comorbidities. As the homeopathic approach is based upon the signs and symptoms of the patients and considering the totality of symptoms, the overall response of adjunctive Homoeopathy in clinical recovery was similar in both genders across age groups. Although the cohort majorly included very mild/mild to moderate cases, it was still found that the high-risk patients had significant survival estimates.

The early clinical recovery in cases where the adjunctive Homoeopathy was administered during the initial days of illness implies a potential role in limiting the disease and providing symptomatic relief to the patients. More focus should be laid on providing adjunctive care during the initial stage of the infection, particularly in the elderly and patients with comorbidities. It was observed that

fever presented in patients only for a median duration of 1 day (IQR: 2-4). This implies symptom-specific relief after using Homoeopathy treatment, easing the patient's discomfort. However, these findings need to be backed up with more robust clinical trials with a control group on a large scale. Nevertheless, the lesser worsening of symptoms and reduced duration of hospital stay can be a crucial finding, especially when bed occupancy is significant for crisis management planning.

As per the advisory of the Ministry of Ayush, Government of India [15] and earlier research studies, homeopathic medicine Arsenic album was found to be most indicated and prescribed in hospitalized COVID-19 cases. COVID-19 has placed an enormous burden on the healthcare system due to its transmission dynamics and polyphasic nature of the illness; it is thus essential that the integrated approach utilizing the strengths and benefits of Homoeopathy is widely promoted.

#### **4.1 Strengths and Limitations of the Study**

The strength of the present study lies in the fact that it is a first attempt to evaluate the approach of integrating Homoeopathy as an add-on treatment for hospitalized COVID-19 cases pragmatically and the availability of many instances for retrospective analysis. It provides valuable insights into the potential role of Homoeopathy in the clinical recovery of patients. The real-time information gathered from a pragmatic approach has been used to derive meaningful information that can be used for designing better public health measures, and the model can be replicated by other states dealing with the COVID-19 crisis.

The current study has some limitations. This data is only from single-arm intervention, and there is no control group for making inferences about the overall effectiveness of Adjunctive Homoeopathy. The information about patients who have yet to receive the adjunctive Homeopathy, if made available from the centers, could have helped in comparing the result and coming up with inferences about the effectiveness of the adjunctive therapy. Further, only some of our hospital medical officers have adequate resources and skills to accurately fill the Electronic Medical Records and standardized formats leading to incomplete and invalid entries. Tracking the missing and incomplete entries was challenging and led to missing information, and more than half of the cases were excluded from the study. Due to the situation during the first wave, planning prospective trial within a short time was not feasible. Efforts have been made to reflect the data in a pragmatic method that reflects the utilization of Homoeopathy as an adjunctive at a large scale. Accurate follow-up of the patients was also not consistently reported in all the circumstances; thereby, the overall symptomatic benefit cannot be statistically analyzed.

#### **5. Conclusion**

The Gujarat model of utilizing Homoeopathy as an adjunctive for treating hospitalized COVID-19 patients in a pragmatic set-up has yielded some preliminary evidence supporting its promising role. The data, which included all age groups of patients, with or without co-morbidities, highlighted that Adjunctive Homoeopathy might have the potential for early relief of clinical symptoms and less progression into severity in the risk group of elderly with comorbidities. There were no reported adverse effects of taking the adjunctive Homoeopathy, making it safe for integrated use in managing COVID-19 patients. Further, it is called for prospective randomized, double-blind, placebo-controlled trials to be conducted to show the role of adjunctive Homoeopathy.

## Acknowledgments

We thank Vaidya Bhavana Patel, Director, AYUSH Department, Govt of Gujarat, and Vaidya Falgun Patel, Deputy Director, Training and Research, AYUSH Department, Govt of Gujarat, for their facilitation and technical support. Acknowledgement is also due to Dr Debadatta Nayak for constant support and guidance during the study. We thank Dr Preeti Negandhi, PHFI, Dr Sampurna Kundu, M. Phil, IIPS and Sh. Arvind Kumar, Statistical Assistant, CCRH, for providing valuable inputs and advice for statistical analysis. We sincerely appreciate the dedication and effort of our frontline healthcare workers and the homoeopathic medical officers. They have been working hard during this pandemic and helping the patients to recover.

## Author Contributions

**Dr Deepti Singh Chalia:** Preparation of study concept, design of method, managing, supervising, and coordinating the study, developing standardized formats for data capturing, Data collection, verification and analyzing data, writing the original draft, getting it reviewed finalizing, and submitting the manuscript. **Dr Anil Khurana:** Development of study concept, supervising, and coordinating the study, finalization of manuscript. **Dr Mehul Trivedi:** Data acquisition, collecting and providing data, Review, and inputs for manuscript finalization. **Dr Pinaken Trivedi:** Data Acquisition framework, critical Review, and inputs for manuscript finalization. **Dr Sarita Gola and Dr Parul:** Supporting in data management and verification, inputs for manuscript finalization

## Competing Interests

The authors have declared that no competing interests exist.

## References

1. Connors JM, Levy JH. COVID-19 and its implications for thrombosis and anticoagulation. *Blood*. 2020; 135: 2033-2040.
2. Asirvatham ES, Sarman CJ, Saravanamurthy SP, Mahalingam P, Maduraipandian S, Lakshmanan J. Who is dying from COVID-19 and when? An Analysis of fatalities in Tamil Nadu, India. *Clin Epidemiol Glob Health*. 2021; 9: 275-279.
3. World Health Organisation. Key Messages and Actions for COVID-19 Prevention and Control in Schools [Internet]. World Health Organisation; 2020. p.3. Available from: <https://www.who.int/docs/default-source/coronaviruse/key-messages-and-actions-for-covid-19-prevention-and-control-in-schools-march-2020.pdf>
4. World Health Organisation. Q&As on COVID-19 for older people [Internet]. WHO; [cited date 2021 April 4]. Available from: [https://www.who.int/docs/default-source/documents/social-determinants-of-health/covid19-advice-older-adults-qandas-cleared.pdf?sfvrsn=2e17964b\\_6](https://www.who.int/docs/default-source/documents/social-determinants-of-health/covid19-advice-older-adults-qandas-cleared.pdf?sfvrsn=2e17964b_6).
5. Qu XK. Observation on clinical effect of Shufeng Jiedu Capsule combined with Arbidol Hydrochloride Capsule in treatment of COVID-19. *Chin Tradit Herb Drugs*. 2020; 5: 1167-1170.
6. Ministry of Ayush. Government of India. Ayush systems [Internet]. [cited date 2023 April 5]. Available from: <https://main.ayush.gov.in/ayush-systems/>.
7. Patwardhan B, Sarwal R. Significance of AYUSH: India's first line of defence against COVID-19. *J Ayurveda Integr Med*. 2021; 12: 227-228.

8. Shinde VH. Homoeopathy in pandemic Spanish flu 1918. *Indian J Res Homoeopath*. 2020; 14: 152-159
9. Mills CE, Robins JM, Lipsitch M. Transmissibility of 1918 pandemic influenza. *Nature*. 2004; 432: 904-906.
10. Donaldson LJ, Rutter PD, Ellis BM, Greaves FE, Mytton OT, Pebody RG, et al. Mortality from pandemic A/H1N1 2009 influenza in England: Public health surveillance study. *BMJ*. 2009; 339: b5213.
11. Nayak D, Chadha V, Jain S, Nim P, Sachdeva J, Sachdeva G, et al. Effect of adjuvant homeopathy with usual care in management of thrombocytopenia due to dengue: A comparative cohort study. *Homeopathy*. 2019; 108: 150-157.
12. Oberai P, Varanasi R, Padmanabhan M, Upadhyaya A, Singh S, Singh SP, et al. Effectiveness of homeopathic medicines as add-on to institutional management protocol for acute encephalitis syndrome in children: An open-label randomized placebo-controlled trial. *Homeopathy*. 2018; 107: 161-171.
13. 513 cases, 38 deaths as COVID-19 spike continues in Gujarat [Internet]. Kolkata: THG PUBLISHING PVT LTD; 2020. Available from: <https://www.thehindu.com/news/national/other-states/513-cases-38-deaths-as-covid-19-spike-continues-in-gujarat/article31808567.ece>.
14. Management of the COVID-19 pandemic in Gujarat-Understanding the governance initiatives, leadership processes and their impact. A Report. IIM Ahmedabad. Available from: [https://www.iima.ac.in/sites/default/files/media-release/14273627820200727\\_An%20IIMA%20Report%20on%20Management%20of%20the%20COVID-19%20Pandemic%20in%20Gujarat\\_English.docx](https://www.iima.ac.in/sites/default/files/media-release/14273627820200727_An%20IIMA%20Report%20on%20Management%20of%20the%20COVID-19%20Pandemic%20in%20Gujarat_English.docx).
15. Ministry of Ayush, Government of India. Advisory from ministry of AYUSH for meeting the challenge arising out of spread of corona virus (COVID-19) in India [Internet]. 2020. Available from: <https://pib.gov.in/newsite/PrintRelease.aspx?relid=200005>.
16. Gujarat AYUSH department [Internet]. [cited date 2021 April 4]. Available from: <https://ayush.gujarat.gov.in/>.
17. Strategy of COVID-19 testing in India (Version 4&5), Indian council of medical research, department of health research [Internet]. [cited date 2021 March 10]. Available from: <https://www.icmr.gov.in/cteststrat.html>.
18. Ministry of Ayush. Guidelines for AYUSH practitioners for COVID 19 [Internet]. [cited date 2021 April 10]. Available from: <https://www.ayush.gov.in/ayush-guidelines.html>.
19. Suvarna BS. Potency, potentisation and application of homoeopathic medicines. Noida: B Jain Publishers Pvt. Ltd.; [cited date 2023 April 10]. Available from: <https://www.homeopathy360.com/what-is-lm-ch-cm-3x-potency-potentization-in-homeopathy-prescribing>.
20. Clinical management protocol for COVID-19 (In Adults) [Internet]. Government of India. Ministry of health and family welfare; 2021. Available from: <https://www.mohfw.gov.in/pdf/UpdatedDetailedClinicalManagementProtocolforCOVID19adultsdated24052021.pdf>.
21. Ortolan A, Lorenzin M, Felicetti M, Doria A, Ramonda R. Does gender influence clinical expression and disease outcomes in COVID-19? A systematic review and meta-analysis. *Int J Infect Dis*. 2020; 99: 496-504.

22. Wang Z, Ye D, Wang M, Zhao M, Li D, Ye J, et al. Clinical features of COVID-19 patients with different outcomes in Wuhan: A retrospective observational study. *BioMed Res Int.* 2020; 2020: 2138387.
23. Brill SE, Jarvis HC, Ozcan E, Burns TL, Warraich RA, Amani LJ, et al. COVID-19: A retrospective cohort study with focus on the over-80s and hospital-onset disease. *BMC Med.* 2020; 18: 194.
24. Hu J, Wang Y. The clinical characteristics and risk factors of severe COVID-19. *Gerontology.* 2021; 67: 255-266.
25. Agrawal U, Raju R, Udvardia ZF. Favipiravir: A new and emerging antiviral option in COVID-19. *Med J Armed Forces India.* 2020; 76: 370-376.
26. Wang Y, Zhang D, Du G, Du R, Zhao J, Jin Y, et al. Remdesivir in adults with severe COVID-19: A randomised, double-blind, placebo-controlled, multicentre trial. *Lancet.* 2020; 395: 1569-1578.
27. Recovery collaborative group. Dexamethasone in hospitalized patients with COVID-19. *N Engl J Med.* 2021; 384: 693-704.
28. Srikanth N, Rana R, Singhal R, Jameela S, Singh R, Khanduri S, et al. Mobile app–reported use of traditional medicine for maintenance of health in India during the COVID-19 pandemic: Cross sectional questionnaire study. *JMIRx Med.* 2021; 2: e25703.
29. Thakar A, Panara K, Patel F, Bhagiya S, Goyal M, Bhide S, et al. Add-on Ayurveda treatment for early stage COVID-19: A single-centre retrospective cohort study from Gujarat, India. *J Evid Based Integr Med.* 2021. doi: 10.1177/2515690X211020685.
30. The Times of India. Aug 23, 2020. Homeopathic drug given to half of Gujarat population since March [Internet]. Bennett, Coleman & Co. Ltd.; 2020. Available from: <https://timesofindia.indiatimes.com/india/homeopathic-drug-given-to-half-of-gujarat-population-since-march/articleshow/77702926.cms>.
31. Bwire GM. Coronavirus: Why men are more vulnerable to COVID-19 than women? *SN Compr Clin Med.* 2020; 2: 874-876.
32. Vahidy FS, Pan AP, Ahnstedt H, Munshi Y, Choi HA, Tiruneh Y, et al. Sex differences in susceptibility, severity, and outcomes of coronavirus disease 2019: Cross-sectional analysis from a diverse US metropolitan area. *PLoS One.* 2021; 16: e0245556.
33. Du RH, Liang LR, Yang CQ, Wang W, Cao TZ, Li M, et al. Predictors of mortality for patients with COVID-19 pneumonia caused by SARS-CoV-2: A prospective cohort study. *Eur Respir J.* 2020; 55: 2000524.
34. Jain V, Yuan JM. Predictive symptoms and comorbidities for severe COVID-19 and intensive care unit admission: A systematic review and meta-analysis. *Int J Public Health.* 2020; 65: 533-546.
35. Zheng X, Luo S, Sun Y, Han M, Liu J, Sun L, et al. Asymptomatic patients and asymptomatic phases of coronavirus disease 2019 (COVID-19): A population-based surveillance study. *Natl Sci Rev.* 2020; 7: 1527-1539.
36. Chen J, Qi T, Liu L, Ling Y, Qian Z, Li T, et al. Clinical progression of patients with COVID-19 in Shanghai, China. *J Infect.* 2020; 80: e1-e6.
37. Barman MP, Rahman T, Bora K, Borgohain C. COVID-19 pandemic and its recovery time of patients in India: A pilot study. *Diabetes Metab Syndr.* 2020; 14: 1205-1211.
38. George N, Tyagi NK, Prasad JB. COVID-19 pandemic and its average recovery time in Indian states. *Clin Epidemiol Glob Health.* 2021; 11: 100740.

39. Takacs M, Frass M, Walder G, Fibert P, Rottensteiner M, Glück W, et al. Adjunctive homeopathic treatment of hospitalized COVID-19 patients (COVIHOM): A retrospective case series. *Complement Ther Clin Pract.* 2021; 44: 101415.
40. Bhattacharjee B, Roja V, Khurana A. Homoeopathic medicine Arsenicum album, the prophylactic/immune booster in COVID-19 pandemic. *Indian J Res Homoeopath.* 2021; 15: 6.
41. Nayak D, Gupta J, Chaudhary A, Singh KG, Deshmukh A, Das D, et al. Efficacy of individualized homoeopathy as an adjunct to standard of care of COVID-19: A randomized, single-blind, placebo-controlled study. *Complement Ther Clin Pract.* 2022; 48: 101602.
42. Lal R, Sharma M, Behera S, Regar RK, Tripathi D, Kumar GN, et al. Pharmacological investigation on acute and sub-acute studies of Arsenicum album in experimental rats. 2022. doi: 10.21203/rs.3.rs-2068666/v1.
43. Varghese M, Damodaran T, Biju B, Sivaraman S, Ghosh O, Nirmal OS. Immunomodulatory action of Arsenicum album 30 in COVID-19: A novel quantum biological approach for elucidating the mechanism of action of the homoeopathic drug. *Proceeding of LMHI GLOBAL COLLOQUIUM 2021 Homeopathy: A Medical Science Ahead of its Time; 2021 December.*