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Prevalence and factors associated with utilization of ayurvedic drugs during COVID-19. A community-based cross-sectional study

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ABSTRACT

Background: COVID-19 pandemic emerged as a major public health emergency. Ayurvedic medicines are not generally considered as conventional medicine. Hence, we aimed to assess the prevalence of utilization of Ayurveda as prophylaxis for COVID-19 during the pandemic, factors associated with utilization, and willingness to use Ayurvedic medicines in future prospects.

Methods: This cross-sectional analytical study was conducted in urban Bengaluru, India from April to May 2022. The sample size of the study was 427. Systematic random sampling was done and data were collected using a validated semi-structured questionnaire.

Results: The mean (SD) age of the participants was 38.9 (±14.08) years. The proportion of utilization of ayurvedic medicines was 22.5% (n = 96, 95% CI 18.6–26.7) and social class was significantly associated with non-utilization (p = 0.042). Among the utilizers, 66% of them used Ayurvedic medicines for prevention/post-COVID ailments. More than half (55%, 95% CI 49.7–59.4) of the individuals were willing to use Ayurvedic medicines in the future and level of education was associated with unwillingness (p=0.010).

Conclusion: Nearly three-fourth of the participants were not utilized Ayurvedic medicines during COVID-19 pandemic. Strengthening ayurvedic services and improving awareness may increase the utilization in the community. An integrated health system approach at the policy level is pivotal in mainstreaming Ayurvedic medicines.

1. Introduction

The novel disease took its origin in China gained momentum and spread globally. It emerged as a global threat, believed to have a zoonotic origin, and was titled "severe acute respiratory syndrome coronavirus 2 (SARS Cov 2)." The symptomatic phase is characterized by fever, cough, and myalgia, and can progress to severe respiratory failure.[1] Thus, this ongoing pandemic has been declared a public health emergency of international concern by the World Health Organization (WHO) due to its highly contagious nature in humans.[2]

The pandemic alarmed countries to take mitigatory actions to check the spread of the infection. In this scenario, the discovery of vaccine was a boon to prevent the severity surge of the disease. The western model of evidence-based medicine in the frontline came to rescue, especially in the critical stage care.[3] In India, along with the mass production of vaccines, potential efforts were made by the Department of AYUSH (Ayurveda, Yoga, Unani, Siddha and Homeopathy) in bringing forth prophylactic measures and guidelines for asymptomatic to mild COVID-19 infection management.[4]

Ayurveda is chiefly concerned with maintaining good health in a healthy individual and curing the diseased. The ayurvedic approach can be understood in two ways: preventive and curative. Swasthavritta is a preventive aspect of Ayurveda.[5]

In recent decades, India has made significant progress in healthcare development, but improvements in awareness and use of alternative medical systems have continued to lag and have yet to be widely implemented.[6] Despite the impact of modern medicine in India, it is critical to understand the community's health-seeking behavior and awareness of ayurvedic medicines. Understanding the utilization pattern will be beneficial in taking appropriate measures to make Ayurvedic medicines worthwhile as a preventive and regenerative medicine.[7] Hence, the current study aimed to assess the prevalence of utilization of Ayurvedic drugs during COVID-19, factors associated with utilization, and willingness to use Ayurvedic drugs in future prospects.

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2. Materials and methods

2.1. Study design, population and setting

This cross-sectional study was conducted from April to May 2022 among individuals aged 18 years and above in the community of urban Bengaluru. Both Government and private ayurvedic facilities or hospitals are available in this area. During COVID-19, a prophylaxis AYUSH kit was distributed to the community by Accredited Social Health Activists (ASHAs).

2.2. Sample size estimation and sampling technique

Considering 50% of the population utilized Ayurvedic drugs during the COVID-19 pandemic, with 5% absolute precision, and 10% non-response rate, the calculated sample size was 427. Urban Bengaluru consists of five taluks: Bangalore north, Bangalore north (addl), Bangalore South, Bangalore east, and Anekal. Among these taluks, Bangalore North (addl) was selected using a simple random sampling method. Of 198 wards in Bangalore North (addl), Chikkabettahalli was chosen conveniently. From the line list of 10427 households in the Chikkabettahalli locality, the required numbers of households were selected using a systematic random sampling technique (sampling interval of 20). One participant from the selected household was chosen randomly.

2.3. Study tool

A validated semi-structured questionnaire was used for the study. The questionnaire included domains to capture the socio-demographic data and questions to explore utilization and willingness to use ayurvedic drugs.

2.4. Data collection

The student researcher and ASHA workers visited the households for data collection. The selected participant from the line-listed household was interviewed using the questionnaire. The questionnaires included socio-demographic details such as age, gender, marital status, family income, education, occupation, awareness of AYUSH COVID preventive medicines, source of information, utilization of Ayurvedic drugs for COVID-19 as prophylaxis, diagnosis/quarantined status for COVID-19, barriers to use, preferences to use, and preferred place for availing services. There were questions related to willingness to use in the future, and the reasons for unwillingness were assessed through the interview. The following question checked participants' willingness to avail Ayurvedic medicines in future, "Would you like to utilize Ayurvedic medications in future pandemics?" The preferable answer allowed for the question was: (a) Yes; (b) No. Written informed consent was taken before the interview. Privacy and confidentiality were maintained during the interview.

2.5. Operational definitions

Utilization of Ayurvedic drugs: The act of using drugs delivered by a public health care system, those prescribed by registered ayurvedic practitioners, or drugs distributed by recognized Ayurvedic institutions/organizations as COVID-19 prophylaxis. Therefore, the following drugs which are recommended by the AYUSH ministry were considered for the study, Joshaadi kashaya churna, AYUSH 64, Samshamani Vati, Chyavanprash, Shwasakutara ras, Taleesapathradi churna, Marichaadi churna, Tribhuvana keerthi ras.

Willingness to use Ayurvedic drugs: If the individual is ready to use ayurvedic medicines in the future.

2.6. Statistical analysis

The data were entered into EpiCollect 5 mobile application and analysis was done using STATA version 14. Categorical variables were summarized as frequencies and percentages. The outcome variable such as utilization and willingness were summarized as percentages with a 95% confidence interval. The association of sociodemographic factors with the outcome variables was analyzed using the Chi-square test, and an unadjusted prevalence ratio with 95% confidence interval was calculated. A p-value of <0.05 was considered statistically significant.

2.7. Ethics policy

The study protocol was reviewed by the Institute Ethics Committee of K S Hegde Medical Academy, Mangalore (INST.EC/EC/160/2021-22). Written informed consent was obtained from each participant before enrolling them in the study.

3. Results

The mean (SD) age of the participants was 38.9 (±14.08) years. Among them, more than half (n = 237) of the participants were females, 35% (n = 151) were graduates, 32% (n = 137) were monthly salaried, 26% (n = 111) belong to social class 3, and 82% (n = 354) belonged to Hindu community, 75% (n = 319) were married. [Table1].

About 22.5% (n = 96 95%CI 18.6–26.7) of the participants used ayurvedic drugs from a registered practitioner in the last two years and more than three-fourths (n = 331) of them did not use. The lack of a facility, the exorbitant cost of the medicine, palatability, lack of belief in

Table 1
Socio-demographic details of individuals aged above 18 years in a selected ward of northern Bengaluru during April–May 2022 (N = 427).

Variable	n	%
Age in years		
<30	120	28.1
30–39	127	29.7
40–49	95	22.3
50–59	38	2.9
≥60	47	11.0
Gender		
Female	237	55.5
Male	190	44.5
Education		
No formal education	23	5.4
Primary (Class 1–7)	38	8.9
Secondary (Class 8–10)	104	24.4
Higher Secondary (Class 11–12)	61	14.3
Graduated	151	35.4
Postgraduate and above	50	11.6
Occupation		
Monthly salaried	137	32.1
Homemaker	94	22.0
Unemployed	82	19.2
Self-employed	75	17.6
Daily waged	39	9.1
Social class*		
Class 1 (Rs7770 and above)	74	17.3
Class 2 (Rs3808-7769)	106	24.8
Class 3 (Rs2253-3808)	111	26.0
Class 4 (Rs1166-2253)	74	17.3
Class 5 (Rs < 1166)	62	14.6
Religion		
Hindu	354	82.9
Muslim	55	12.9
Christian	18	4.2
Marital status		
Married	319	74.7
Unmarried	85	19.9
Widowed	23	5.4

Modified B G Prasad's classification for May 2021

Ayurveda, and other factors were cited by those who did not use the service. About 45.4% of the participants were unwilling to use ayurvedic drugs in future and more than half (n = 233) of the participants were willing to use ayurvedic drugs in future for any ailments/pandemics. The reasons for unwillingness were lack of knowledge, evidence, hospital, and belief. Some participants stated that they were comfortable using allopathic medicines. [Table 2]. More than half (n = 51) of the participants were diagnosed/quarantined for COVID-19 infection, and 63% used ayurvedic medicines for COVID-19 infection. About 34% were used for treatment and 66% were used for the prevention of COVID-19 infection. [Fig. 1].

There was no significant association between age, gender, education, occupation, religion, marital status and non-utilization of ayurvedic drugs. Social class 2 had a significant chance of non-utilization (uPR: 1.1 95%CI 1.00–1.39, p = 0.042) when compared to the reference group [Table 3].

There was no significant association between age, gender, occupation, social class, religion, marital status and unwillingness to use ayurvedic drugs in future prospects. Among various education levels, the chance of unwillingness to use ayurvedic drugs was found to be 1.9 times higher in the class 1–7 category compared to the reference group (uPR: 1.9 95%CI 1.16-3.19 p = 0.010). [Table 4].

4. Discussion

In this study, the utilization proportion of ayurvedic drugs in the last two years was found to be 22.5%. Low utilization rates might be due to misconceptions and a lack of awareness about the Ayurvedic system of medicine. This study tried to explore the reasons for not utilizing Ayurvedic drugs and 30% of the individuals were not availed because of a lack of nearby facilities.

The utilization rates were more among illiterates, which is inconsistent with the study by Ramesh et al.[7] However, a study done by Singh P et al.[8] found less utilization among no formal education individuals. The proportion of utilization in this study is seen as higher among Christian religions as compared to other religions. This may be because of the cultural practices of the usage of herbal medicines for common illnesses in their community. The other reason is the mentioning of biblical plants and their benefits in their literature.[9]

In this study, utilization among married was found to be 75%. This finding is observed to be not similar to the results of a study conducted at Dhaka[10] and a national survey.[11] In the present study, we found no

Table 2
Distribution of reasons for non-utilization and willingness to use Ayurvedic medicines among the individuals aged above 18 years in a selected ward of northern Bengaluru during April–May 2022 (N = 331).

Reasons	n	%
Non-utilization		
No specific reason	101	30.5
Unavailability of dispensaries	100	30.2
Expensive	45	13.6
Palatability	36	10.9
No belief in Ayurveda	31	9.4
No knowledge	26	14.1
Not necessary	15	8.1
Use allopathy medicines	12	6.5
No evidence	2	1.0
Not suitable for the body	1	0.5
Unwilling to use		
No knowledge	45	23.2
Not necessary	31	15.9
Unavailability of dispensary/hospital	27	13.9
No evidence	25	12.8
No specific reason	24	12.3
Not suitable for body	11	5.6
Use allopathy medicines	11	5.6
No belief	10	5.1

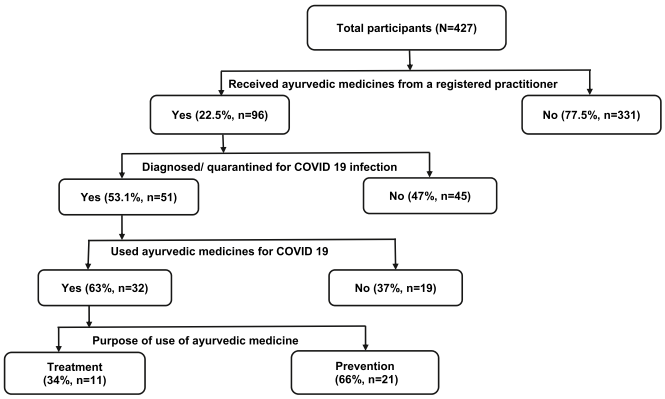

Fig. 1. Flow chart showing distribution of utilization of ayurvedic medicines during COVID 19 and purpose of use among the individuals aged above 18 years in a selected ward of northern Bengaluru during April–May 2022 (N = 427).

significant association between age, gender, education, occupation, religion and marital status and non-utilization. These results were consistent with a study on Siddha medicine.[12] According to this study, it was found that the higher the social class more the chance of non-utilization and unwillingness was significantly associated with no formal education and unemployment. The possible explanations are that the facility is too far away, resulting in indirect costs as well as high treatment and drug costs. To our knowledge, other factors might be the easy availability of allopathic medicines with minimal dietary regimens.[12]

Relatives, friends, and neighbours have a 12.2%, 24.4%, and 12.3% influence on the use of ayurvedic medicines, respectively. More than half of the individuals (55%) had taken Ayurvedic medicine for respiratory-related diseases. These findings are not similar to a study done in Chennai.[13] The plausible reason may be the usage of medicines during COVID-19 pandemic period. It was also found, nearly 41% of individuals had heard about preventive Ayurvedic medicines for COVID 19 infection which disagrees with a study conducted in Siddha medicine,[12] and mass media was the primary source of information, which is not on par with a comparative study.[14]

Among the study participants, 54.6% were willing to use Ayurvedic medicines in future prospects for any ailments or during pandemics. This may be due to the experiences of preventive benefits seen during COVID-19. Individuals with postgraduate and above-educated levels were willing to use Ayurvedic medicines, which could be attributed to their healthy lifestyle-seeking behaviour. It was also found; the Muslim community were more willing to use Ayurvedic medicines in future when compared to other community. This might be due to the Islamic culture's use of herbal medicines or Unani medicines. The unwillingness to use the Ayurvedic medicines was 45% and factors that discouraged to unwillingness were inadequate expertise in practising the medicine, less understanding about the medicines, difficulty in access to the facility, and long duration of healing. If the above factors are addressed properly it will result in greater acceptance of Ayurvedic medicine among non-users.

This is one of the first studies to determine the proportion of willingness to use Ayurvedic medicines. There are some limitations to this study, utilization of Ayurvedic medicines in the last two years was the criteria and this might lead to possible recall bias. As this is a cross-sectional study, a cause-effect relationship between variables, utilization, and willingness cannot be established.

5. Conclusion

The current study reported that public awareness of Ayurvedic medicines for COVID-19 prophylaxis was relatively low in the urban

Table 3
Factors associated with the prevalence of non-utilization of ayurvedic drugs and willingness to use ayurvedic drugs in future prospects (n = 427).

Variables	n	Utilization		uPR (95% CI)	P-value
		No n (%)	Yes n (%)		
Age in years					
<30	120	95 (79.2)	25 (20.8)	1.0 (0.86–1.24)	0.723
30–39	127	96 (75.6)	31 (24.4)	0.9 (0.81–1.18)	0.890
40–49	95	73 (76.8)	22 (23.2)	1.0 (0.82–1.21)	0.974
50–59	38	31(81.6)	7 (18.4)	1.0 (0.85–1.32)	0.572
60 & above	47	36 (76.6)	11 (23.4)	Reference	
Gender					
Female	237	184 (77.6)	53 (22.4)	1.0 (0.90–1.11)	0.947
Male	190	147 (77.4)	43 (22.6)	Reference	–
Education					
Class 1-7	38	32 (84.2)	6 (15.8)	1.1 (0.86–1.50)	0.360
Class 8-10	104	80 (76.9)	24 (23.1)	1.0 (0.79–1.35)	0.768
Class 11-12	61	48 (78.7)	13 (21.3)	1.0 (0.80–1.40)	0.656
Graduate	151	117 (77.5)	34 (22.5)	1.0 (0.81–1.35)	0.720
PG & above	50	37 (74.0)	13 (26.0)	1.0 (0.74–1.34)	0.994
No formal education	23	17 (73.9)	6 (26.1)	Reference	–
Occupation					
Monthly salaried	137	105 (76.6)	32 (23.4)	1.0 (0.83–1.26)	0.774
Unemployed	82	67 (81.7)	15 (18.3)	1.0 (0.88–1.35)	0.381
Self-employed	75	57 (76.0)	18 (24.0)	1.0 (0.81–1.27)	0.848
Homemaker	94	73 (77.6)	21 (22.3)	1.0 (0.84–1.29)	0.691
Daily waged	39	29 (74.4)	10 (25.6)	Reference	–
Social class					
Class 2 (Rs3808-7769)	106	90 (84.9)	16 (15.1)	1.1 (1.00–1.39)	0.042
Class 3 (Rs 2253–3808)	111	83 (74.8)	28 (25.2)	1.0 (0.87–1.24)	0.638
Class 4 (Rs 1166–2253)	74	60 (81.1)	14 (18.9)	1.1 (0.94–1.35)	0.179
Class 5 (<1166)	62	45(72.6)	17 (27.4)	1.0 (0.82–1.24)	0.901
Class 1 (Rs7770&above)	74	53 (71.6)	21 (28.4)	Reference	–
Religion					
Hindu	354	280 (79.1)	74 (20.9)	1.2 (0.89–1.87)	0.175
Muslim	55	40 (72.7)	15 (27.3)	1.1 (0.79–1.77)	0.397
Christian	18	11 (61.1)	7 (38.9)	Reference	–
Marital status					
Unmarried	85	71 (83.5)	14 (16.5)	1.0 (0.97–1.22)	0.124
Widowed	23	16 (69.6)	7 (30.4)	0.9 (0.68–1.19)	0.502
Married	319	244 (76.5)	75 (23.5)	Reference	–

uPR-unadjusted prevalence ratio, CI- Confidence interval.

study population. The most common reasons for the non-utilization of Ayurvedic medicines were lack of nearby service facilities, scientific evidence, affordability and palatability of medicines. In order to encourage the adoption and use of Ayurvedic medicines for both preventive and therapeutic purposes, efforts must be made to generate

Table 4
Factors associated with the prevalence of willingness of ayurvedic drugs and willingness to use ayurvedic drugs in future prospects (n = 427).

Variables	n	Willingness		uPR (95% CI)	P-value
		No n (%)	Yes n (%)		
Age in years					
<30	120	50 (41.7)	70 (58.3)	1.0 (0.68–1.54)	0.884
30–39	127	59 (46.5)	68 (53.5)	1.1 (0.77–1.70)	0.489
40–49	95	45 (47.4)	50 (52.6)	1.1 (0.78–1.75)	0.445
50–59	38	21 (55.3)	17 (44.7)	1.3 (0.87–2.14)	0.173
60 & above	47	19 (40.4)	28 (59.6)	Reference	–
Gender					
Male	190	87 (45.8)	103 (54.2)	1.01 (0.82–1.24)	0.895
Female	237	107 (45.2)	130 (54.8)	Reference	–
Education					
No formal education	23	9 (39.1)	14 (60.9)	1.3 (0.67–2.53)	0.432
Class 1-7	38	22 (57.9)	16 (42.1)	1.9 (1.16–3.19)	0.010
Class 8-10	104	47 (45.2)	57 (54.8)	1.5 (0.93–2.41)	0.090
Class 11-12	61	33 (54.1)	28 (45.9)	1.8 (1.11–2.92)	0.017
Graduate	151	68 (45.0)	83 (55.0)	1.5 (0.94–2.37)	0.083
PG & above	50	15 (30.0)	35 (70.0)	Reference	–
Occupation					
Monthly salaried	137	64 (46.7)	73 (53.3)	1.1 (0.82–1.54)	0.456
Daily waged	39	19 (48.7)	20 (51.3)	1.1 (0.77–1.77)	0.443
Self-employed	75	35 (46.7)	40 (53.3)	1.1 (0.79–1.60)	0.512
Homemaker	94	42 (44.7)	52 (55.3)	1.0 (0.76–1.51)	0.668
Unemployed	82	34 (41.5)	48 (58.5)	Reference	–
Social class					
Class 2 (Rs3808-7769)	106	52 (49.1)	54 (50.9)	1.2 (0.88–1.76)	0.200
Class 3 (Rs 2253–3808)	111	50 (45.1)	61 (54.9)	1.1 (0.80–1.63)	0.436
Class 4 (Rs 1166–2253)	74	37 (50.0)	37 (50.0)	1.2 (0.88–1.83)	0.190
Class 5 (<1166)	62	26 (41.9)	36 (58.1)	1.0 (0.71–1.60)	0.745
Class 1 (Rs7770&above)	74	29 (39.2)	45 (60.8)	Reference	–
Religion					
Hindu	354	162 (45.8)	192 (54.2)	1.0 (0.76–1.44)	0.771
Christian	18	8 (44.4)	10 (55.6)	1.0 (0.56–1.85)	0.952
Muslim	55	24 (43.6)	31 (56.4)	Reference	–
Marital status					
Married	319	149 (46.7)	170 (53.3)	1.1 (0.70–2.01)	0.507
Unmarried	85	36 (42.3)	49 (57.7)	1.0 (0.61–1.90)	0.784
Widowed	23	9 (39.1)	14 (60.9)	Reference	

uPR-unadjusted prevalence ratio, CI- Confidence.

scientific evidence. For the mainstreaming of the Ayurvedic healthcare system, policymakers should lay more emphasis on the integrated health system approach.

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Data availability

The datasets analyzed during the current study are available from the corresponding author upon reasonable request.

Declaration of competing interest

None.

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