

## Original Research Article

# Assessing the knowledge, attitudes and practices regarding COVID-19 and homoeopathy among the citizens of Delhi and national capital region, India: a cross-sectional online survey

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## ABSTRACT

**Background:** Infectious disease pandemic of COVID-19 continues to be a global & public health challenge. Delhi and NCR of India is densely populated with access to an integrated health care delivery system, with a promoted preventive homoeopathic medicine for flu like illnesses. To assess knowledge, attitudes and practices to this unanticipated situation and homoeopathy a survey was conducted.

**Methods:** An online cross-sectional survey was conducted in a sample of the residents of Delhi and NCR using a self-prepared pilot-tested structured format. The obtained data was analysed using descriptive and inferential statistics.

**Results:** 925 people completed the survey with 55.5% of the study group being females. Mean knowledge score obtained was  $7.57 \pm 1.41$  (good knowledge  $\geq 9$ ; average 6-8; poor  $\leq 5$ ) while mean attitude score was  $3.27 \pm 1.31$  (negative score 0-3; positive score  $\geq 4$ ). Majority of the respondents (86%) had an adequate knowledge about the disease in general and were optimistic about recovery from the disease. Gender had negligible impact on the average knowledge score, while the score differed significantly with education and occupation. In the absence of an available vaccine, 29.47% respondents considered prophylactic potential of homoeopathy.

**Conclusions:** Results reveal adequate knowledge and practices in the educated residents but below average mean attitude score. Public has welcomed the governmental initiative of homoeopathic prophylactic, and their belief in its therapeutic potential furthers the studies to determine its role as an adjuvant. Further extensive cross-sectional surveys to cover various strata of population are required to assess the widespread pattern of KAP in the general population.

**Keywords:** COVID 19, Delhi and national capital region, Homoeopathy, KAP survey

## INTRODUCTION

On 30<sup>th</sup> January 2020, the International Health Regulations (2005) Emergency Committee of the World Health Organization (WHO) declared the novel coronavirus disease (COVID-19) a public health emergency of international concern. Soon, the WHO called for collaborative efforts of all countries to prevent its rapid spread and advised active surveillance, early detection, isolation and case management, contact tracing and prevention. To contain the spread of the disease, while emphasizing on the need for general measures India declared a nationwide lockdown from 25<sup>th</sup> March to 31<sup>st</sup> May with few relaxations at different time periods in different states.<sup>1,2</sup>

Delhi and National Capital Region (NCR) covers about 21200 m<sup>2</sup> and harbours a population density of nearly 2200/m<sup>2</sup>. As on 27<sup>th</sup> June 2020, the capital recorded more than 80,200 positive COVID-19 infection cases, more than 2500 reported deaths and more than 260 declared hotspot zones.<sup>3,4</sup> Certain areas in this region face threat of a serious outbreak due to deep challenges in implementing social distancing and lack of basic sanitation viz. access to clean water and soap for handwashing. The matters are further complicated by presence of large numbers of migrant community from various states across the country.

The region has an integrated health care delivery system with conventional and AYUSH (Ayurveda, Yoga and naturopathy, Unani, Siddha and Homoeopathy) systems of medicine. Amongst the AYUSH systems, homoeopathic medicines have been reported to be useful in various epidemics in the past as well.<sup>5-7</sup> The Ministry of AYUSH, Government of India, has also been promoting a preventive homoeopathic medicine for flu like illnesses viz. COVID-19 since January 2020 which is suggestive of enhancing immune response and has anti-viral properties.<sup>8</sup>

The state and the central governments have been repeatedly evolving strategies and releasing advisories to contain the unprecedented spread of infection, which, in spite of enforced lockdown continued to spread. In such an unanticipated situation the perspective and understanding of the general public can influence their practices and attitude towards the diseases, govern the panic response and are likely to impact its progression, outbreak management, implementation of control procedures and outcome of therapeutic measures.

Although knowledge is an essential in promoting self-care, knowledge alone cannot result in the practice of preventative behaviour or holding a positive attitude. The individual's awareness of a disease and possibility for adopting a positive attitude or practices depends on various factors, which includes perceiving four: seriousness of a disease, susceptibility of a disease, benefits of positive attitude and practice and lastly

barriers that might restrain an individual to make positive changes. Such information has typically been gathered through various types of cross-sectional surveys, the most extensively used being knowledge, attitude and practices (KAP) surveys. Researchers across the globe have found them useful to assess and realise the impact of the current scenario.<sup>9-11</sup> Another such work on adolescents and young people of Bihar and Uttar Pradesh is ongoing by a team of Indian researchers.<sup>12</sup>

In this study, we explored the KAP towards COVID-19 and homoeopathy in the citizens of Delhi and NCR during its rapid upsurge. It is expected that the findings of the study shall provide an insight when designing future interventions to promote specific messages to enhance knowledge, change attitude and improve practice regarding COVID-19.

### *Objectives*

To assess knowledge, attitudes and practices regarding COVID-19 and homoeopathy among the general public in Delhi and national capital region.

## METHODS

### *Protocol*

A cross sectional study was conducted amongst a convenient sample of the citizens of Delhi and NCR from 4<sup>th</sup> April 2020. Due to lockdown the information was gathered through an online survey in English language circulated through the masses via authors' network by the means of social platforms (WhatsApp, Facebook, and Twitter). The attempt was to reach out to as many people as possible through social media/electronic media platforms. However, the duration of the survey was fixed for 10 days, irrespective of the number of responses. The collection of responses was managed through survey monkey ([www.surveymonkey.com](http://www.surveymonkey.com)), a professional online evaluation and voting platform. An informed consent was taken before the formal survey and participants had to confirm their willingness to participate voluntarily and the right to withdraw from the study at any point of time was also discussed. After a brief introduction of the objectives and background, declarations of anonymity and confidentiality, the participant was then directed to complete the survey. The names and contact details were masked to avoid revealing of participant's identity. Letter codes were assigned to link each respondent to their responses. The entire questionnaire responses of the data set were coded numerically to maintain anonymity. The key to code linkage information was stored separately from the data file used for statistical analysis.

### *Inclusion criteria*

Age  $\geq 16$  years of age; resident of Delhi and NCR at the time of the COVID-19 outbreak.

### Exclusion criteria

Incompletely filled KAP questionnaire and unwillingness to participate.

### Questionnaire

An extensive literature search was conducted initially in order to design a structured survey questionnaire. The self-prepared structured survey form consisted of two parts viz. demographics and KAP questionnaire which was reviewed for face validity by some seasoned medical practitioners and their patients who were awaiting their turn. Further, it was pilot tested on 12 people who reported no difficulties in understanding or answering the questions. Demographic variables included age, gender, education, occupation, and place of current residence in Delhi and NCR which gathered open ended responses. The questionnaire consisted 10 questions on knowledge (K1-K3 and K8 to evaluate the awareness about the disease; K4-K7, K9-K10 for general knowledge about the clinical aspects of the disease), 7 questions for evaluating participant's attitudes and beliefs and 3 questions to assess appropriate practices and behaviour towards COVID-19. All these questions held mandatory responses. Based on the 3 pointer Likert-scale, three answer choices (agree, disagree and not sure) were provided for these questions. The last question on practices held open ended responses and was optional depending upon the participant's response to previous question in the practice section.

### Data analysis

After checking the data for normality, descriptive and inferential statistics were used to describe and analyse the data. Categorical variables were measured as percentages while continuous variables were expressed as mean±standard deviation. Statistical analysis of survey data was conducted using International Business Machines Statistical Package for Social Sciences (IBM SPSS) software version 21. A p value of <0.05 (two tailed) was considered as statistically significant.

## RESULTS

The study has been reported in consideration with the STROBE guidelines as far as possible.<sup>13</sup>

The Cronbach's alpha of the questionnaire using SPSS statistics was 0.731.

### Sample characteristics

A Shapiro-Wilk's test and a visual inspection of their histograms, Q-Q plots and box plots showed that the knowledge scores were having skewness 0.695 (SE 0.084) and kurtosis 1.310 (SE 0.167). Attitude scores, on the other hand were having skewness 0.428 (SE 0.084) and kurtosis 0.085 (SE 0.167). Non-parametric statistics

tests were therefore chosen to explain the results of the survey.

### Response rate and characteristics of the participants

A total of 925 people responded to the survey out of which 70 respondents were not considered due to the pre-defined inclusion and exclusion criteria: unwillingness to participate (n=2), incomplete survey responses [n=66 (females=33, males=33)] or age not complying with the defined criteria (n=2). The respondents who did not reveal about their gender, age group or education (n=2) but completed the survey response were only considered for descriptive statistics and were excluded from the demographical analysis and also where association between demographic and study variables of questionnaire was analysed.

The average response rate for the survey was 92.30% with an average of 4 minutes and 30 seconds recorded as time taken to complete the survey.

**Table 1: Socio-demographic profile.**

Variables	Frequency	Percentage
<b>Gender</b>		
Female	473	55.5
Male	380	44.5
<b>Age groups (in years)</b>		
16–25	259	30.3
26–35	292	34.2
36–45	165	19.3
46–55	85	9.9
56–65	33	3.8
66–75	17	1.9
>75	2	0.2
<b>Occupation</b>		
Student	166	19.5
House wife/ home maker	85	10
Government/private service	347	40.7
Self-employed/business	133	15.6
Health care services	89	10.4
Retired/ unemployed	33	3.9
<b>Region of Delhi and NCR</b>		
North Delhi	136	15.9
South Delhi	135	15.8
East Delhi	106	12.4
West Delhi	121	14.2
Central Delhi	109	12.8
NCR (Haryana)	147	17.2
NCR (Uttar Pradesh)	99	11.6
<b>Education</b>		
Less than or equal to 12 <sup>th</sup> standard	122	14.3
Bachelor's degree/ diploma/certificate	278	32.6
Master's degree or above	288	33.8
Professional courses/degree	165	19.3

The mean age of the respondents was 33.50±12.07 years with maximum respondents being in the age group 26 to 35 years (34.6%, n=292). The mean age of the female respondents was 32.16±11.18 years while for the males was 35.09±13.05 years. Respondents of the survey were found to be spread across various parts of Delhi and NCR. Almost 66% of respondents were graduates or

above. The demographic profile of study participants including frequencies is given in Table 1.

### Knowledge

Descriptive statistics for each item in the questionnaire are given in Table 2.

**Table 2: Response frequencies of the KAP survey.**

Question	Agree	Disagree	Not sure
<b>K1. Is COVID-19 a challenge to health and society?</b>	98.94% (n=846)	0.46% (n=4)	0.58% (n=5)
<b>K2. It is not necessary for children and young adults to worry about infection with the COVID-19 virus.</b>	12.04% (n=103)	85.02% (n=727)	2.9% (n=25)
<b>K3. Eating or contacting animals would result in the infection with the COVID-19 virus.</b>	22.22% (n=190)	43.97% (n=376)	33.08% (n=289)
<b>K4. Persons with COVID-19 cannot infect others when fever is not present.</b>	4.44% (n=38)	89.8 (n=768)	5.7% (n=49)
<b>K5. Do we have a vaccine for COVID-19?</b>	2.92% (n=25)	76.25% (n=652)	20.81 (n=178)
<b>K6. If a person has not travelled in last 4 months, gives no history of possible exposure with infected person and suffers with sore throat, cold, cough and fever, should the person be tested for COVID-19?</b>	56.72% (n=485)	28.88% (n=247)	14.38% (n=123)
<b>K7. Does every infection with COVID-19 require hospitalisation?</b>	38.01% (n=325)	47.25% (n=404)	14.73% (n=126)
<b>K8. Is it necessary to notify the health authorities if anyone tests positive for COVID-19?</b>	97.8% (n=837)	0.70% (n=6)	1.40% (n=12)
<b>K9. Does a COVID-19 positive infection means patient would surely die?</b>	0	95.55% (n=817)	4.44% (n=38)
<b>K10. There currently is no effective cure for COVID-19, but early symptomatic and supportive treatment can help most patients recover from the infection.</b>	93.33% (n=798)	1.28% (n=11)	5.38% (n=46)
<b>A1. Washing hands frequently, wearing masks and social distancing are the best ways of keeping yourself safe from catching COVID-19?</b>	98.01% (n=838)	0.35% (n=3)	1.63% (n=14)
<b>A2. Do you think that we must avoid using Chinese products or foods or visiting Chinese restaurants currently?</b>	51.4% (n=440)	33.2% (n=284)	15.3% (n=131)
<b>A3. Do you think lock down by the Government of India was an over-reaction to control COVID-19?</b>	8.7% (n=75)	88.5% (n=757)	2.69% (n=23)
<b>A4. Is COVID-19 a bio-weapon developed by China to become a super-power?</b>	43.2% (n=370)	12.7% (n=109)	44.9% (n=376)
<b>A5. Can antibiotics be taken for COVID-19?</b>	12.5% (n=107)	41.05% (n=351)	46.43% (n=397)
<b>A6. Can homeopathy treat COVID-19?</b>	23.32% (n=207)	15.67% (n=134)	60% (n=513)
<b>A7. Can homeopathy prevent COVID-19?</b>	29.47% (n=252)	14.15% (n=121)	56.37% (n=482)
<b>P1. Do you wear mask when you leave home and wash/sanitize your hands frequently, especially on return?</b>	98.59% (n=843)	0.81% (n=7)	0.58% (n=5)
<b>P2. Have you taken any preventive medicine for COVID-19?</b>	18.84% (n=161)	75.08% (n=642)	6.08% (n=52)

The knowledge score ranged from 0 to 10, with a higher score denoting a better knowledge of COVID-19. The mean knowledge score obtained was 7.57±1.41 and majority of the respondents i.e. 86% (n=735), had an average knowledge score (6-8); while 7.1% (n= 61) of the respondents showed lack of knowledge about COVID-19, with scores ≤5.

Almost 98 % respondents considered COVID 19 to be a challenge to health and society and warranted notification to the health authorities. In spite of this a majority of respondents (more than 93%) were clear that early identification and action would prevent mortality. 47.25% respondents felt that every infection with COVID 19 would not require hospitalization.

Gender had negligible impact on the average knowledge score, while the score differed significantly with education and occupation (p value <0.001), where

respondents with the professional courses or degrees appeared to be more knowledgeable than other educational groups (Table 3).

**Table 3: Mean score ranks corresponding demographics.**

Variable	K score 7.57±1.41 Mean rank	P value	A score 3.27±1.31 Mean rank	P value
<b>Gender<sup>a</sup></b>				
Female	428.86	0.80	424.15	0.69
Male	424.68		430.55	
<b>Age group<sup>b</sup></b>				
16–25	397.36	0.41	402.89	0.63
26–35	432.62		435.12	
36–45	432.04		433.79	
46–55	416.65		421.92	
56–65	455.42		399.71	
66–75	470.15		449.91	
>75	601.75		267.75	
<b>Education<sup>b</sup></b>				
Less than or equal to 12 <sup>th</sup> standard	367.09	<0.001*	362.9	<0.001*
Bachelor's degree/ certificate/ diploma	399.09		409.8	
Master's degree or above	435.75		427.3	
Professional courses/ degree	503.05		502.6	
<b>Occupation<sup>b</sup></b>				
<b>Student</b>	379.75	<0.001*	400.14	<0.001*
House wife/ home maker	391.36		399.95	
Government/ private service	423.34		418.02	
Self-employed/ business	445.53		427.32	
Retired	419.41		383.89	
Health care services	538.57		553.46	
<b>Region of Delhi and NCR<sup>b</sup></b>				
North Delhi	445.35	0.80	428.90	0.19
South Delhi	429.48		447.10	
East Delhi	395.74		374.00	
West Delhi	425.72		416.42	
Central Delhi	428.72		415.43	
NCR (Haryana)	436.45		445.40	
NCR (Uttar Pradesh)	417.51		452.08	

a: Mann-Whitney U Test; b: Kruskal-Wallis H Test; \*P value <0.05 taken as significant

### Attitude/beliefs

The survey revealed a below average mean attitude score of 3.27±1.31 amongst the respondents (negative attitude score of 0-3 in 59.8% respondents (n=511); positive score ≥4 among in 40.2% respondents (n=344). 88.5% of the respondents approved the lockdown decision by the Government of India and 98% believed that washing hands frequently, wearing masks and social distancing are the best ways of keeping themselves protected from the disease.

While only 12.5% respondents agreed with the role of antibiotics for treatment of COVID 19, almost 23.3%

opined that homoeopathy can treat and almost 29.5% believed that it could offer prophylactic role.

The attitude score was observed to differ significantly with occupation (p value <0.001) and education (p value <0.001). No statistically significant difference in scores was observed among other demographic variables (Table 3).

### Practice

03 questions evaluated the practices amongst the respondents to which 98.6% respondents informed that they wore a mask while stepping out of the house and frequently sanitized/washed their hands. 18.9%

respondents also confirmed taking a preventive medication to protect themselves, details of which can be seen in Table 4.

#### ***Relationship between respondent's knowledge, attitudes, and practices***

A weak positive Pearson's correlation was observed between knowledge and attitude as well as between knowledge and practices ( $p$  value  $<0.001$ ). No significant correlation could be drawn between attitudes and practices ( $p$  value 0.070).

**Table 4: Preventive medicines consumed by people.**

Preventive medicine	Number of persons (N)
Cinchona and plasma therapy	1
Homoeopathy (name unspecified)	25
Arsenicum album 30	68
Arsenicum album 200	3
Arsenicum album 30 and Psorinum	1
Influenzinum 30	5
Influenzinum 30 and Arsenicum album 30	2
Tinospora Q, Ocimum sanctum Q	2
Tuberculinum 30	3
Arsenicum album 30 and Hydroxychloroquine	2
Hydroxychloroquine	13
Hydroxychloroquine, Antiflu	1
Hydroxychloroquine, Vitamin C supplement	1
Immune boosters	3
Mulethi / Giloy Juice	5
Paracetamol	4
Septilin	1
Tulsi /adrak	3
Vitamin C and D supplement	1
Vitamin C supplement	3
Non-specified	14
<b>Total</b>	<b>161</b>

By creating a linear regression model for predicting practice habits, knowledge about COVID-19 was found to be the significant predictor ( $p$  value  $<0.001$ ) compared to attitude ( $p$  value 0.07). This indicates that higher knowledge was translated into higher compliance of preventative measures.

Among the study data, a chi-square test of independence was performed to examine the relation between demographic profile and the knowledge attitude and practices of the respondents. The relation between education ( $p \leq 0.001$ ) and occupation ( $p \leq 0.001$ ) with KAP was significant.

## **DISCUSSION**

To the best of our knowledge this is the first survey assessing the KAP towards COVID-19 and homoeopathy amongst the residents of Delhi and NCR. The KAP survey presents a cross sectional overview of the current pandemic situation in the residents of varying age groups (16 and above) across all zones of Delhi and its neighbouring NCR. The literate residents presented a high response rate to the survey. The females in our data set were slightly more knowledgeable and males exhibited marginally better practice habits.

Majority of the respondents (86%) had an adequate knowledge about the disease in general, absence of a specific vaccine currently and reflected a responsible behaviour towards the society by understanding the necessity to notify the health authorities about the disease. It is important to identify that knowledge about infection control can be a predictor of good practice and its inadequacy could result in uncertainties and non-stringent control measures.

These findings were a little unexpected, because this epidemiological survey was conducted during the early phase of the pandemic. We consider that this is primarily due to the sample characteristics, 85.7% held a bachelor's degree or higher. Moreover, the pandemic and its spread has been hogging the prime news time and the social media platforms which are lapped up by this group. The significant positive association between levels of education and COVID-19 knowledge scores support this speculation.

Mixed responses about the need for testing persons without any history of contact and the requirement for hospitalisation in each case could have been because of the scenario in the early phase of lockdown where even the medical personnel and hospitals were unclear about their roles. In addition to this, some doubts about possible sources of infection still seem to be existing amongst the masses as only 43.97% participants were able to correctly identify that eating or being in contact of animals does not propagate or result in an infection. This is an important insight into the lacunae which can be rectified by taking up more awareness programmes and campaigns across the capital. These responses also emphasize the probable need for more meaningful and targeted awareness programmes for persons with lower levels of education and the uneducated or for those lacking access to electronic means of communication.

Further, the vulnerable sections of the society such as senior citizens or the dependents with disability/disease who due to restricted newspaper services during lockdown and limited access to online health information resources are more likely to have inadequate knowledge, unsuitable behaviours and preventative practices which can enhance their falling prey to the pandemic.

While majority (99%) respondents considered COVID-19 to be a big challenge to health and society today yet 95% were optimistic about recovery from the disease and understood that every infection shall not prove fatal. This level of clarity amongst the respondents shows that panic reactions and mass hysteria shall possibly not be prevalent amongst the literate strata of Delhi and NCR.

However, the circulating conspiracy theories on the various social media or print media platforms seem to have influenced almost 44% of the respondents in considering the pandemic to be a result of a bioweapon developed by China to become a superpower. An equal number of respondents were unsure about it. Further, half the respondents were biased who opined on forgoing the use of Chinese products or visiting Chinese restaurants as the pandemic originated in China. Another 15% were not sure of their answer.

With regards to treatment of infected persons, majority of the respondents (93.33%) considered that early identification and symptomatic treatment could influence the disease outcome favourably. Almost 87% of the respondents disagreed or were unsure about the therapeutic role of antibiotics in COVID-19 and 23% opined about the possibility of treating it with homoeopathy.

In the absence of an available vaccine, 29.47% respondents considered prophylactic potential of homoeopathy. Almost 19% reported using a preventive medication, the most popular being homoeopathy which was consumed by almost 70% in this group. While 22% out of those who took homoeopathy didn't specify the name of the homoeopathic medicine; *Arsenicum album*, a recommended prophylactic in the advisory of Ministry of AYUSH was seen as a very popular choice amongst the rest, being taken by 87% of people singularly (n=71) or in combination with some other remedy (n=5).

The ministry has also recently launched an Ayush Sanjivani app to track the recommendation adopted by the actual number of people.<sup>14</sup> A recent survey from the same time period shows that a fair number of homoeopathic practitioners could maintain their clinical practices despite the lockdown which seems to be a contributory factor in the considerable awareness and usage of homoeopathic prophylactic by public and the recent governmental initiative to release the clinical guidelines for treating COVID-19 patients with adjuvant homoeopathy, seems to endorse the public demand reflected in this survey.<sup>15,16</sup>

The successful sensitisation of the masses about the importance of washing hands, wearing masks etc. as preventive measures to protect and restrict the spread of the pandemic is evident in the survey as 98% respondents strongly agreed and applied the same in practice. This shows that though early into the lockdown phase the

government was able to communicate its importance to the citizens of the country.

The strength of this study is that it presents the public's understanding about the current pandemic and gathering of data in a short span of time on a digital platform. It highlights findings from a group which has seldom been studied in Delhi so far.

On the other hand, this study has some limitations as well. The survey was conducted on a convenient sample of population, whatever was possible to achieve in a defined period of time. A better study sample would have been a larger one collected through random stratified sampling method. Since the study participants were the literate community which understood English and were active on social media, the study findings can only be generalized possibly to urban Delhi (or other metropolitan cities of the country) population. As the vulnerable elderly group contributed to only 6% of the dataset, the information gathered from this group therefore can't be generalised. More surveys reaching out to certain demographic groups like under-privileged sections, inadequately educated and elderly population would be required to address the rising numbers post the unlock to assess their KAP.

In addition to the limited sample representativeness, another possible limitation of this study is the assessment of attitudes and practices towards COVID only through a limited number of questions, which could have been better understood via focussed group discussion and in-depth interview, but was not feasible due to obvious reasons.

## CONCLUSION

To summarise, our survey findings reveal that majority of the educated residents of Delhi and NCR in various zones had adequate knowledge and practices towards COVID 19 pandemic possibly due to the awareness programs and the circulating news and information on various social media platforms. However, most of these displayed a below average mean attitude score. The survey also highlights the belief of a significant section of the public towards the therapeutic potential of homoeopathy towards the disease, which furthers the studies to determine its role as an adjuvant. Further, the governmental initiative in promoting a possible homoeopathic prophylactic also found acceptance amongst a significant number of respondents.

Baseline findings on awareness of COVID-19 symptoms, perceived risk, awareness of and ability to carry out preventive behaviours, misconceptions, and fears inform about the fairly successful development of government and other stakeholders' interventions and/or strategies.

To successfully “flatten the curve” in Delhi and NCR, and across the country, extensive and effective mitigation efforts are required by the health authorities to design policies and interventions that are easily understood and relevant to beneficiaries’ lives.

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