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Perceptions and factors associated with COVID Appropriate Behavior (CAB) obedience among general public in India: A mixed methods research

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Abstract:

BACKGROUND: The purpose of the study was to analyze the public perception toward COVID Appropriate Behavior (CAB) obedience and to identify the factors associated with declining CAB.

MATERIALS AND METHODS: It is a mixed methods study conducted from November 2021 to September 2022 in Pune city, India. A set of 15-CAB guidelines published by the Ministry of Health and Family Welfare, Government of India (GoI), were used as a base document to design the instruments of qualitative and quantitative study. Using a one-sample Kolmogorov–Smirnov test, CAB scores were tested for normality and distribution. Comparisons of various parameters were done using z test for proportion and paired *t*-test (statistical significance level was 0.05). Thematic content analysis was conducted for qualitative data analysis and verbatims are reported where applicable.

RESULTS: The main motivation for people to get vaccinated was family and personal safety and a higher proportion of people felt safer post-vaccination which was linked to a reduced likelihood of CAB obedience. Qualitative results showed that people's lack of empathy and concern for others leads to undesirable personal behaviors such as spitting in public places, not wearing masks, etc.,. The need for socialization is high but discomfort with the use of masks/face shields and habituation with the disease were prominent causes of CAB disobedience.

CONCLUSION: We conclude that reduced fear and gradual habituation have led to reduced CAB obedience. There is a need to reinforce empathy and concern for others to improve adherence to CAB like maintaining social distancing and wearing masks in public places for personal and social safety from the disease.

Keywords:

CAB, CAB obedience, COVID Appropriate Behavior, perception, qualitative, safety

Introduction

The COVID-19 pandemic and the subsequent lockdown are regarded as the most serious global health disaster of the century.^[1-3] The multiple pandemic waves spiked the mortality and morbidity rates.^[4-7] In India, the COVID-19 vaccination drive was

initiated in 2021 and the Indian government continued to focus on vaccination, to ensure maximum coverage of the first dose amongst the eligible beneficiaries and provide second dose to all the due beneficiaries through the “*Har Ghar Dastak campaign*” implemented from November’ 2021 across India.^[8]

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To further control the outbreak of COVID-19, the Ministry of Health and Family Welfare (MOHFW), Government of India (GoI), published COVID Appropriate Behaviour (CAB) guidelines for the community. CAB is a set of 15 guidelines that are directed toward self-education and self-awareness among the general community to control the spread of COVID-19.^[8] CAB is based on behavioral and self-hygiene principles such as wearing a face mask, maintaining social distancing in public areas, avoiding needless travel, not spitting in open public places, and hand hygiene, among the other guidelines. However, with the passing of time adherence to CAB started to decline.

To reinforce the importance of CAB obedience, the Jan Andolan campaign was launched in October 2020 and later in April 2021, the five-fold strategy of testing, tracing, Treatment, CAB, and vaccination was the focus of the GoI.^[9] In February 2022, UNICEF launched “Zero2Hero,” a multimedia campaign with a dual aim to sustain awareness regarding the importance of adhering to CAB and motivate every eligible person to get fully vaccinated.^[10] Subsequently, several campaigns were initiated by GoI where the general public had been urged to follow CAB.^[11-13]

Lack of adherence to CAB, vaccine hesitancy, and emergence of new mutant strains are the factors resulting in the subsequent COVID-19 waves.^[14-16] This is further complicated due to major unawareness and myths about modes of transmission of COVID-19, lack of expert validation, and misinformation due to social media especially in rural populations.^[17] As the public movement started normalizing with the opening of transport and reopening of schools and offices, there was and continues to be an increased personal and social responsibility on the citizens and common public to adhere to CAB.^[18]

The threat of COVID-19 infection spread is not over yet as many countries in different regions are projecting a spike in COVID cases toward the end of the year 2022.^[19-22] Hence, adherence to CAB must continue which is essential for public safety, yet, there is a highly observed CAB disobedience.^[17,23] Multiple studies from India and abroad report a decreasing trend of compliance of CAB.^[24-26] To maintain CAB adherence, there is a necessity to understand the factors linked with CAB acceptance in daily life. We found few studies that emphasized the importance of compliance with CAB and personal safety behaviors even after vaccination.^[5,27] Nevertheless, such studies that explore and examine the factors associated with CAB disobedience are sparse in the literature. The present study attempts to fill this knowledge gap by examining the factors responsible for decreasing CAB adherence. The study throws light on

the public perception of CAB adherence with a special focus on investigating the causes of declining CAB obedience and presents recommendations for improving CAB compliance.

Materials and Methods

Study design and setting

This web-based cross-sectional study was conducted from November 2021 to September 2022 in the general community of Pune city, India using Google Forms. We used a concurrent mixed-methods study design consisting of a quantitative community-based cross-sectional study combined with a qualitative phenomenological design.

Study participants and sampling

Respondents were selected through convenience sampling from the general community of Pune City. The *quantitative data* were collected using the google form that included the purpose of the study, and two compulsory fields, namely, consent to participate and confirmation of receiving at least one COVID-19 vaccine. Once this was filled out, the respondents could fill up the further sections of baseline data and CAB-related questions. Ten percent of respondents of quantitative research were contacted with a request to spare time for face-to-face in-depth interviews. Those who consented to participate were included in a *qualitative study*. In-depth interviews were conducted using a structured questionnaire based on the 15 CAB guidelines of MOHFW, GOI. Prior to the interview, participants were informed about the aims and objectives of the study. During the interviews, suitable probes were used to encourage participants to speak.

Inclusion and exclusion criteria

The inclusion criteria were the age of respondents more than 18 years, having completed at least one dose of COVID-19 vaccination, and willingness to participate in the study. Those who did not provide consent to participate or did not fall in the inclusion criteria were excluded from the study. All ethical standards were followed for the study and participation in the study was completely voluntary and anonymous.

Data collection tool and technique

The base document, for designing both the quantitative and qualitative instruments, was the CAB guidelines published by MOHFW, GOI.^[8] A set of 15 guidelines was used to design the questions for a qualitative and quantitative study. Baseline information was collected for age, gender, vaccination status, pre-existing illness, place of vaccination, and whether availed free or paid vaccination. The Socio-Economic Status (SES) was assessed using the updated modified Kuppaswamy

scale.^[28] For quantitative study, information from participants was sought on their perception of the importance and adherence to the various CAB practices. Further, an attempt was made to analyze any changes in their perception of CAB adherence after vaccination, or due to habituation with disease and other related factors. The perception of various parameters was compared for early pandemic time against the current perceptions on factors like: feeling of safety, type of mask used, likelihood of maintaining social distance, frequency of hand sanitization, avoiding unnecessary travel, and overall importance of CAB. The qualitative questionnaire was also prepared on the same themes.

Ethical Considerations: The study was cleared of any ethical issues

Data Analysis: The data analysis was done using Statistical Package for Social Sciences (SPSS V. 22.0). CAB scores were tested for normality of the distribution using a one-sample Kolmogorov–Smirnov test. Measurement data were expressed as mean and standard deviation (SD) and categorical data were expressed as frequency and percentage. Paired *t* tests were used for comparison between different pre- and post-vaccination effects among study participants. Comparisons of various parameters among the study participants for pre- and post-data are done using a *z* test for proportion. The statistical significance level of the test was considered $\alpha = 0.05$. Only statistically significant results are reported in the study.

The responses to qualitative interviews were summarized and compiled in a transcript which was repeatedly read by each author independently and later combined reading was done for identifying themes and sub-themes. Thematic content analysis was conducted and reported as categories. A concurrent analysis of interviews was done to make a judgment of the conceptual saturation point. Five-step approach was followed for analysis, namely, familiarizations with the data, generating initial codes, searching for themes, reviewing themes, and defining and naming themes.^[29] Verbatim statements are reported wherever relevant. Further, a comparative analysis was done to validate the quantitative results with the findings of qualitative results.

Results

A total of 606 completed forms were received and their baseline characteristics are provided in Table 1. A total of 353 (58.25%) participants in the study were vaccinated with both doses of the COVID-19 vaccine, whereas the remaining 41.75% had been vaccinated only with the first dose. The age range considered was from 18 to 76 years, the mean age (\pm standard deviation) was 30.53 ± 11.593 years, the median age was 25 years, the

and modal age was 23 years. As per the Kuppaswamy scale, the majority of the respondents in our study were from upper, upper middle, and lower middle class and none from lower SES.

More than 80% of respondents got vaccinated for the safety of themselves and family and remaining to be able to return to studies or work, and travel freely. Hence, there was eagerness among people to get vaccinated to return to normal personal and social life. Around 45% of the respondents had paid out of their pocket for vaccination, whereas the remaining had received it free of charge through various collaborating organizations as shown in Table 1.

As shown in Table 2, the results of paired *t* test showed that a higher proportion of people were feeling safer after vaccination. Though around 30% of respondents were neutral, the majority were likely and extremely likely to feel safe post-vaccination. All the results of the paired *t* test were statistically significant.

Fewer people were likely to maintain social distancing in public after getting vaccinated. Comparison of pre- and post-vaccination (using paired *t* test) showed that a larger proportion of the respondents were less likely to follow CAB. However, the parameters did not show a significant association with any other factors except pre- and post-vaccination.

The higher likelihood of feeling safe after vaccination was statistically significant as per *z* test results too [Table 3]. Fewer people were likely to maintain social distance while in public, avoid unnecessary travel, sanitize hands, and follow the CAB post-vaccination. To further validate the findings of the quantitative study and explore the underlying reasons that may not surface in quantitative research, objectives were explored through qualitative research. Following are the results of the same. It is evident that in pre-vaccination, the majority of the people reported higher use of N95 masks. However, post-vaccination, a higher proportion of people preferred cloth masks and disposable surgical masks.

Results of a qualitative study

Out of all the people who were approached, 17 respondents who agreed to a face-to-face in-depth interview were contacted for an appointment (Baseline information in Table 4). The in-depth interviews revolved around the perception of respondents about the importance of CAB, the impact of various evolving factors on CAB obedience, and the expected general behavior of people in public spaces. The results of the thematic analysis with the final six themes are presented in Figure 1. The codes are encircled and themes are shown in boxes. These codes are further classified into

Table 1: Demographic characteristics of the study participants (n=606)

Variable	Category	Frequency	Percentage
Gender	Male	280	46.2
	Female	326	53.8
Marital Status	Unmarried	389	64.19
	Married	212	34.98
	Others (divorced/separated)	5	0.83
Occupation	Students	287	47.36
	Professionals	228	37.62
	Unemployed	27	4.46
	Others	64	10.56
Education	Graduate	337	55.61
	High school certificate	7	1.16
	Intermediate or diploma	20	3.30
	Profession or Honors	242	39.93
Monthly Family Income in Rupees (INR)	≥ 123,322	211	34.82
	61,663–123,321	164	27.06
	46,129–61,662	72	11.88
	30,831–46,128	59	9.74
	18,497–30,830	36	5.94
	6,175–18,496	31	5.12
Socioeconomic status (SES)*	Upper	190	31.35
	Upper middle	352	58.09
	Lower middle	64	10.56
	Pre-existing illness	Yes	52
	No	554	91.42
Reason of taking COVID vaccine	Due to mandatory guidelines	55	9.08
	Safety of self and family	492	81.19
	To be able to join back work/office/college	48	7.92
	To travel and move around freely	11	1.82
Mode of vaccination	Free campaign by office of self/family member	214	35.31
	Corporate tie up	69	11.39
	Government hospital	57	9.41
	Self-payment	266	43.89

*Kuppuswamy SES calculated as per the summative score of education, occupation, and income (Saleem, 2019)

factors that were linked to CAB disobedience (gray background) and those linked to CAB obedience (white background). Others are reported as neutral factors. The explanation of the same is as follows.

Theme I—Personal habits: Respondents mentioned various personal habits associated with CAB adherence on a personal and public level. People are finally getting an opportunity to socialize after a long gap and are therefore indifferent toward the CAB obedience particularly after being vaccinated.

“After almost 2 years people started coming out and started socializing. That very feeling of social and emotional reconnect is making people happy. Sanitization and use of masks is reduced by more than 60% as compared to pre-vaccination.” (Respondent #7)

Many respondents highlighted the frequent usage of a mask, as well as breathlessness, skin irritation,

perspiration, and discomfort. As a result, another factor connected to poor CAB adherence is discomfort with the usage of masks and face shields.

On being probed about other habits associated with CAB, respondents largely spoke about spitting which is linked with tobacco and Betel leaf (*paan*) and is a major factor leading to poor CAB obedience.

“No. Not at all. It (spitting) has not reduced at all as this is directly linked with people’s habit of eating gutka and pan. So, people are still not cautious about their public behavior” (Respondent #6).

Moreover, with better awareness of the disease, people are less conscious about disinfection and surface cleaning.

“I was particular about cleaning surfaces, tables, and washing vegetables. (But) when I understood the reality that the virus is

Table 2: Results of paired t test for comparison of pre- and post-vaccination perception of various CAB parameters

Parameter (What is your likelihood of....)	Vaccination stage	Frequency (%)					Mean (SD)	P*
		Extremely unlikely	Unlikely	Neutral	Likely	Extremely likely		
Feel safe	Pre	72 (11.9)	94 (15.5)	220 (36.3)	105 (17.3)	115 (19.0)	3.15 (1.26)	0.00*
	Post	3 (0.5)	13 (2.1)	169 (27.9)	270 (44.6)	151 (24.9)	3.94 (0.80)	
Maintain social—distance	Pre	16 (2.6)	2 (0.3)	84 (13.9)	208 (34.3)	296 (48.8)	4.36 (0.72)	0.00*
	Post	11 (11.8)	18 (3.0)	115 (19.0)	257 (42.4)	205 (33.8)	4.10 (0.80)	
Following CAB	Pre	5 (0.8)	16 (2.6)	172 (28.4)	217 (35.8)	196 (32.3)	4.45 (0.88)	0.624
	Post	0 (0)	107 (17.6)	115 (19)	207 (34.2)	177 (29.2)	4.44 (0.81)	
Following COVID-19 related precautions	Pre	12 (2)	27 (4.5)	99 (16.3)	212 (35)	256 (42.2)	4.61 (0.82)	0.009*
	Post	4 (0.7)	35 (5.8)	147 (24.3)	222 (36.6)	198 (32.7)	4.54 (0.78)	

*P-value for paired t-test. *Significant at 0.01

Table 3: Results of z test for comparison of various CAB parameters

How likely are you to....	Pre-vaccination		Post-vaccination		Z ^c	P
	Frequency	%	Frequency	%		
Feel safe						
Extremely likely	115	19	151	24.9	3.440	0.0005**
Likely	105	17.3	270	44.6	-0.599	0.5485
Neutral/somewhat	220	36.3	169	27.9	-3.428	0.0006**
Unlikely	94	15.5	13	2.1	-1.043	0.2983
Extremely unlikely	72	11.9	3	0.5	2.011	0.0444*
Continue to maintain social-distancing						
Extremely likely	296	48.8	205	33.8	5.3031	0.000**
Likely	208	34.3	257	42.4	-2.89	0.003*
Neutral/somewhat	84	13.9	115	19.0	-2.4	0.164
Unlikely	2	0.3	18	3.0	-3.6	0.0003**
Extremely unlikely	16	2.6	11	1.8	0.9732	0.332
Continue hand sanitization practices						
Extremely likely	308	50.8	274	45.2	1.95	0.5111
Likely	174	28.7	142	23.4	2.09	0.0366*
Neutral/somewhat	115	19.0	172	28.4	-3.85	0.00012**
Unlikely	6	1.0	12	2.0	1.42	0.01556
Extremely unlikely	3	0.5	6	1.0	-1.001	0.317
Avoid unnecessary travel						
Extremely likely	380	62.7	470	77.6	-5.64	0.000**
Likely	106	17.5	36	5.9	6.25	0.000**
Neutral/somewhat	72	11.9	55	9.1	1.59	0.0111
Unlikely	25	4.1	10	1.7	2.57	0.0101*
Extremely unlikely	23	3.8	35	5.8	-1.61	0.1074
Following CAB						
Extremely likely	196	32.3	177	29.2	1.18	0.238
Likely	217	35.8	207	34.2	0.541	0.5892
Neutral/somewhat	172	28.4	115	19.0	3.85	0.00012**
Unlikely	16	2.6	107	17.6	-8.65	0.000**
Extremely unlikely	5	0.8	0	0.0	2.24	0.0251*
Type of mask						
Disposable surgical mask	116	19.14	142	23.43	1.82	0.019*
Cloth double-layer mask	174	28.71	196	32.34	1.31	0.021*
N95/KN95 Mask	316	52.14	268	44.24	2.87	0.037*

^cZ test for proportion was used to test the significance. *Significant at 0.05. **Significant at 0.01

alive on the surface only for a few hours, I realized the cleaning is not needed much” (Respondent # 17).

are also more open to seeking psychosocial support anytime they feel they need it, which was formerly regarded as taboo.

Respondents mentioned that they seek information only from verified government sources like COWIN. Respondents

Theme II—Emotions: Many emotions were spelt out during the course of interviews. The most frequently

Table 4: Baseline information of In-depth interview respondents (n=17)

Respondent No	Age (in years)	Vaccination status (completed single or double dose of vaccination)	Gender	Marital status	Occupation	Education level
1	45	Double dose	F	Married	Service	Postgraduate
2	35	Double dose	F	Married	Business	Graduate
3	62	Double dose	M	Married	Service	Postgraduate
4	30	Double dose	F	Married	Service	Doctorate
5	21	Double dose	M	Unmarried	Student	Graduate
6	23	Double dose	M	Unmarried	Student	Graduate
7	36	Double dose	F	Married	Business	Graduate
8	48	Double dose	F	Married	Service	Graduate
9	22	Single dose	F	Unmarried	Student	Graduate
10	24	Double dose	M	Unmarried	Service	Graduate
11	51	Double dose	F	Married	Housewife	Postgraduate
12	48	Double dose	F	Married	Service	Postgraduate
13	56	Double dose	F	Married	Housewife	Postgraduate
14	42	Single dose	M	Married	Service	Postgraduate
15	45	Double dose	M	Married	Business	Postgraduate
16	56	Double dose	M	Married	Service	Postgraduate
17	27	Double dose	F	Unmarried	Service	Postgraduate

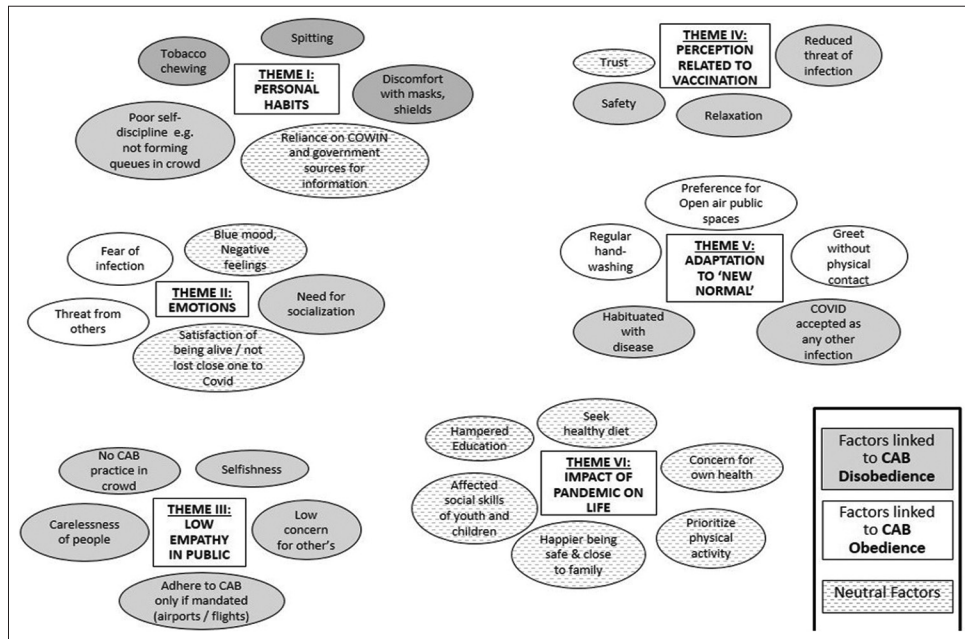


Figure 1: Factors linked to CAB disobedience (gray background) and CAB obedience (white background)

expressed emotions were fear, threat, and negative feelings.

“Post-vaccination threat and negativity is reduced to a major extent. As compared to initial days of lock-down (March 2020) frequency of sanitization is reducing very fast. (Respondent # 1).

Many respondents displayed a need for socializing with other people but with CAB obedience to keep away the fear of infection. This indicates a dilemma between the need to socialize and expectations toward maintaining precautions. This has links and overlaps with the theme—I (personal habits).

“We need to meet socially for traditions and festivals, but only with proper precautions. I feel scared when someone without a mask stands close and talks to me. At the end of the day I feel lucky that I am alive and my family is fine” (Respondent # 14).

Words like “happiness,” “satisfaction,” and “excitement” were heard in interviews as people spoke about meeting with friends and family in social gatherings leaving behind the virtual calling techniques that became a norm during the lockdown. Hence, people reported fear of infection and the necessity of CAB together, but this is contradictory to the common behavior as CAB obedience is very low despite being in crowded places.

Theme III—Low empathy in public: Respondents believed that even in public and crowded places people don't practice CAB like social distancing, forming queues, wearing masks, and controlling spitting. Respondents expressed that people have low empathy and concern for others.

"Unless people suffer (with the disease) themselves they don't realize its (CAB) importance. In our culture it is not a norm to form queues in public" (Respondent #7).

"If people decide (to maintain CAB) then it is possible but is unlikely in public places like markets, theater, etc., due to the large population. People are following norms only in public places where it is mandatory" (Respondent # 1).

Some respondents said that due to the population issue, crowding is inevitable. The only factors that can motivate people to practice CAB are a concern for themselves and others.

(It is largely due to the) Mindset of people and population density. Whenever people will have a strong desire to protect themselves and their family members from the spread of COVID, they will maintain social distance (Respondent #11).

Low empathy, lack of concern for others, and selfishness are the reported factors for poor CAB obedience.

Theme IV—Perception related to vaccination: Factors like trust, safety, feeling of relaxation, and reduced threat were reported post-vaccination. However, there was also a fear of new variants and getting infected despite vaccination.

"I feel certainly safer after vaccination as compared to initial days but not 100% confident. There is no surety about the safety from new variants" (Respondent # 8).

"Earlier it was very safe but now after getting the news that even after a double dose of vaccination, people are getting infected, (so there is a) little feeling of risk. But still I feel safer as compared to pre-vaccination." (Respondent #1)

Respondents said that the feeling of safety and the declining threat is also keeping people away from following CAB.

"Yes. There is always a feeling of family responsibility and family should not suffer because of family members who are frequently out/traveling. Even after vaccination they should wear mask and keep distance in public" (Respondent # 2).

Theme V—Adaptation to "New Normal": Post-vaccination people are more relaxed and there are multiple ways in which people are adapting to the "new normal." People mentioned many changed preferences like not preferring

to greet by handshake, preferring only open-air public spaces, and so on.

"The changes in the behavior may not be just because of vaccination but the overall picture is positive now. Daily routine is coming to normal so automatically it is making people little relaxed in terms of COVID norms" (Respondent # 4).

Respondents stated that people are now habitual with the disease and hence do not find the need to wear masks or follow other norms.

"Very soon life will come to normal, and people will be used to living with COVID-19 just like several other viruses. Taking proper care is always necessary. Meditation, listening to good music and small some socialization is needed" (Respondent #5).

"(It is) very much possible to greet people without touching, in Indian style of saying Namaste. But people especially young generation are more inclined towards hugging and hand shake which is to be avoided" (Respondent # 15).

Theme VI—Impact of pandemic on life: The impact of COVID-19 was reported on all domains of life like increased diet consciousness, practicing yoga, and physical exercises.

"Working from home created health issues. (My health is) Physically affected to a greater extent" (Respondent # 14).

Participants showed a higher affinity toward social life to make up for the missed social interactions of past two years. However, WFH was reported to have affected life to a greater extent.

"Professionally. WFH has made people lazy and dull. It has affected health negatively. Also, learning from home has affected children's psychological health very badly. They have lost social life." (Respondent #16).

A deep sense of uncertainty has sunk into people due to social disconnect, job loss of self or watching acquaintances lose jobs, and financial difficulties due to mixed reasons.

"We have to move on. Don't allow this (pandemic) to come in the way. We should think about people working on daily wages and their business especially those who lost their jobs in pandemic."(Respondent # 9).

"People became very selfish and are worried about their own health. We understood true relations in this difficult time." (Respondent #1).

The impact of education gaps for students of all ages, prospective careers, and long-term COVID side effects

such as decreased stamina, and physiological aches are reasons for poor performance in daily life.

Discussion

The current study was designed to investigate the public's opinion of CAB adherence, with a particular emphasis on the causes of declining CAB compliance. We found that post-vaccination people felt safer. Most respondents got vaccinated for their own and their families' safety. Hence, vaccination was largely attached to a feeling of safety which is corroborated by recent studies.^[13] Following immunization, the likelihood of wearing masks and overall CAB obedience has decreased. Post-vaccination, tendency to avoid unnecessary travel and continue hand sanitization is also reduced. Recent research shows that appropriate knowledge of COVID-19 and those living in urban areas are more likely to adhere to CAB.^[24] Some research, like ours, found that CAB adherence was unrelated to age, gender, education level, residence, or occupation, whereas other studies showed that CAB adoption depends on knowledge level, attitude, and socio-demographic characteristics.^[25,30] Respondents in our study stated that they are now more willing to seek any type of psychosocial support. Unlike in the past, asking for help while suffering from loneliness was taboo, however, we could not find corroborating research.

Qualitative analysis showed that personal habits like discomfort with masks and face shields discouraged people from adhering to CAB. People are not used to forming a queue in congested locations, making it harder to maintain social distancing. Contrarily, as people's demand for socialization grows, adherence to CAB becomes even more important.

Spitting is another significant CAB disobedience that is exceedingly unsanitary and may be infectious. This is primarily associated with Betel leaf (Paan) and tobacco chewing, making it a difficult compulsive habit to break. These findings are similar to other recent studies highlighting the avoidance of masks, social distancing, and unrestricted public spitting.^[17,23] Multiple studies from India and abroad have reported decreasing compliance with CAB.^[24-26]

The basic understanding suggests that for high adherence to CAB, there is a necessity to understand the factors that are linked to acceptance of CAB in daily life. Though limited in number, we found few studies that emphasized the importance of CAB in both pre- and post-vaccination.^[5,27]

Other significant issues related to CAB disobedience are habituation with the disease, considering it as a

regular infection and a low empathy quotient among general public. According to the respondents, people are selfish and have a very low concern for others and hence, follow CAB only when it is a legal mandate, like at airports, on flights, etc., All this is associated with the carelessness of people and low concern regarding others unless their own people are affected. There is a strong need to reinforce the importance of CAB obedience and educate people.^[30] However, one study reported a slightly differing finding that education is the single most strong predictor for adopting CAB rather than knowledge and attitude.^[31,32]

Social communications and awareness campaigns of the government should be more "slice of life" and adopt a communication that prompts a feeling of self-loss and reinforces empathy. These observations are corroborated by a previous research finding that a person's ability to take a certain preventive action depends on their living and employment situation.^[18] Hence, it is critical that awareness campaigns and policy suggestions must address the actual lived reality of people like perceived susceptibility, severity, points of resistance, motivations, and reward.^[1,25] Additionally, there is an urgent need to put a restraint on the unauthorized and unverified information circulation on social media leading to misinformation and hoaxes.^[33] The authorities certainly need to regulate and curb these platforms.^[23]

As time passes, people are getting habituated to the illness, but the need to maintain CAB in public cannot be undermined. Recent research mentions that COVID-19 increased the likelihood of a stroke and blood clots and has risen the cases of Alzheimer's disease in the elderly population.^[34,35] COVID-19 has led to rising chronic illnesses including diabetes and mental conditions.^[3] This reinforces the need for following CAB, especially in public places for the safety of self and others. The threatening prevalence of COVID-19 recurrence in many nations^[19-22] emphasizes the urgent need for making available efficient therapies and vaccinations around the world.^[5,36]

Limitations and recommendation

The strength of our study is that we have reported results on the obedience of CAB which is not reported by many studies. Findings of the study on the factors determine CAB obedience which need to be focused on for designing social awareness campaigns and communication methods. The limitation of the study is the dynamism due to the rapid changes in COVID-19 pandemic progression which may pose some limitations in the generalizability of the findings. Nevertheless, the study still poses some very important findings to understand the perception related to CAB and develop strategies for enhanced adherence to CAB for personal

and social safety. Hence, the solution to long-term pandemic control is CAB obedience and strategic implementation by addressing all three aspects, namely, cultural, administration, and healthcare.^[31]

Conclusion

Personal and family safety, and the feeling of fear and threat were the major motivational factors behind vaccination. The study concludes that reduced fear of infections post-vaccination and gradual habituation are the main predisposing factors for reduced CAB obedience. Moreover, a higher need for socialization, discomfort due to masks and face shields, and a feeling of safety are further factors associated with declining CAB adherence. Qualitative results showed that low empathy among people and poor concern for others result in negative personal habits like spitting in public places, not wearing masks, or forming queues in crowded public places. Despite the declining incidence of COVID cases, it remains important to adhere to CAB like social distancing, masks, and other practices for personal and public safety. Social messages should emphasize empathy, concern for others in public, social consciousness, and moral responsibility toward the safety of society at large. Future research should focus on the motivational factors that trigger CAB adherence to design social messages in various media to reestablish CAB obedience in public and crowded places.

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Conflicts of interest

There are no conflicts of interest.

References

1. Chakraborty I, Maity P. COVID-19 outbreak: Migration, effects on society, global environment and prevention. *Sci Total Environ* 2020;728:138882.
2. Kumar A, Nayar KR. COVID 19 and its mental health consequences. *J Ment Health* 2021;30:1-2.
3. Saqib MA, Siddiqui S, Qasim M, Jamil MA, Rafique I, Awan UA, et al. Effect of COVID-19 lockdown on patients with chronic diseases. *Diabetes Metab Syndr* 2020;14:1621-3.
4. Abramson A. How COVID-19 may increase domestic violence and child abuse. American Psychological Association. April, 2020. Available from: <https://www.apa.org/topics/covid-19/domestic-violence-child-abuse>. [Last accessed on 2021 Sep 23].
5. Asrani P, Tiwari K, Eapen MS, Hassan MI, Sohal SS. Containment strategies for COVID-19 in India: Lessons from the second wave. *Expert Rev Anti Infect Ther* 2022;20:829-35.
6. Loiwal M. 20% increase in patients with mental illness since coronavirus outbreak: Survey. *India Today*. 31 March, 2020. Available from: <https://www.indiatoday.in/india/story/20-percent-increase-in-patients-with-mental-illness-since-coronavirus-outbreak-survey-1661584-2020-03-31>. [Last accessed on 2021 Sep 23].
7. Department of Health & Family Welfare (DHFw), Ministry of Health & Family Welfare, Government of India, 2021-22. Annual Report 2021-22. Available from: <https://main.mohfw.gov.in/sites/default/files/FinalforNetEnglishMoHFW040222.pdf>. [Last accessed on 2022 Aug 10].
8. Ministry of Health & Family Welfare (MOHFW), Government of India. An Illustrated Guide on COVID Appropriate Behaviour. 2021. Available from: <https://www.mohfw.gov.in/pdf/illustrativeguidelineupdate.pdf>. [Last accessed on 2021 Sep 23].
9. All India Radio (AIR). News Service Division. Special campaign for Covid-19 appropriate behaviour being launched today to ensure 100% mask usage, personal hygiene and sanitation. April, 2021. Available from: <https://newsonair.gov.in/News?title=Special-campaign-for-Covid-19-appropriate-behaviour-being-launched-today-to-ensure-100%25-mask-usage%2C-personal-hygiene-and-sanitation&id=413573>. [Last accessed on 2021 May 15].
10. Gupta A, Sarkar S. UNICEF India unveils new 'Zero2Hero' campaign. Feb 2022. Available from: <https://www.unicef.org/india/press-releases/unicef-india-unveils-new-zero2hero-campaign>. [Last accessed on 2022 Apr 27].
11. The Economic Times. Stay alert, keep following Covid-appropriate behaviour: PM Modi to people. 24 April, 2022. Available from: https://economictimes.indiatimes.com/news/india/stay-alert-keep-following-covid-appropriate-behaviour-pm-modi-to-people/articleshow/91049506.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst. [Last accessed on 2022 Apr 27].
12. Purohit N, Chugh Y, Bahuguna P, Prinja S. COVID-19 management: The vaccination drive in India. *Health Policy Technol* 2022;11:100636.
13. Vaishya R, Sibal A, Malani A, Prasad KH. SARS-CoV-2 infection after COVID-19 immunization in healthcare workers: A retrospective, pilot study. *Indian J Med Res* 2021;153:550-4.
14. Bansal S, Thomas S, Gangwar A, Sharma A. A literature review on impact of COVID-19 and current immunization status: The Indian scenario. *Biol Sci* 2022;2:127-36.
15. Joshi RK, Mehendale SM. Prevention and control of COVID-19 in India: Strategies and options. *Med J Armed Forces India* 2021;77(Suppl 2):S237-41.
16. Kalam MA, Davis TP Jr, Shano S, Uddin MN, Islam MA, Kanwagi R, et al. Exploring the behavioral determinants of COVID-19 vaccine acceptance among an urban population in Bangladesh: Implications for behavior change interventions. *PLoS One* 2021;16:e0256496.
17. Naresh SJ, Reddy MM, Suryanarayana R, Bhattacharyya A, Kamath PB. Awareness, practices, and myths related to coronavirus disease-19 among rural people in Kolar District, South India: A community-based mixed-methods study. *J Educ Health Promot* 2022;11:57.
18. Kollamparambil U, Oyenubi A. Behavioural response to the Covid-19 pandemic in South Africa. *PLoS One* 2021;16:e0250269.
19. IANS. EU health watchdog urges Europe to prepare for new Covid wave. *ETHealth News Network*. September 21, 2022. Available from: https://health.economictimes.indiatimes.com/news/industry/eu-health-watchdog-urges-europe-to-prepare-for-new-covid-wave/94350210?action=profile_completion&utm_source=Mailer&utm_medium=newsletter&utm_campaign=ehealth_news_2022-09-22&dt=2022-09-22&em=a2FzdHVyaXNodWtsYTE4QGdtYWlsLmNvbQ==. [Last accessed on 2022 Sep 24].
20. PTI. China shuts down world's largest electronic market after COVID spike. *ETHealth News Network*. August 30, 2022. Available

- from: https://cio.economicstimes.indiatimes.com/news/corporate-news/china-shuts-down-worlds-largest-electronic-market-after-covid-spike/93867686?utm_source=Mailer&utm_medium=newsletter&utm_campaign=etcio_news_2022-09-04&dt=2022-09-04&em=a2FzdHVyaXNodWtsYTE4QGdtYWlsLmNvbQ==. [Last accessed on 2022 Sep 22].
21. Reuters. France's health body warns of a resurgence of COVID virus in the country. EHealth News Network. September 16, 2022. Available from: https://health.economicstimes.indiatimes.com/news/industry/frances-health-body-warns-of-resurgence-of-covid-virus-in-the-country/94248264?action=profile_completion&utm_source=Mailer&utm_medium=newsletter&utm_campaign=ethealth_news_2022-09-18&dt=2022-09-18&em=a2FzdHVyaXNodWtsYTE4QGdtYWlsLmNvbQ==. [Last accessed on 2022 Sep 22].
 22. Reuters. EU health regulator says COVID pandemic not over. The World Health Organization has said the pandemic remains a global emergency. EHealth News Network. September 21, 2022. Available from: https://health.economicstimes.indiatimes.com/news/industry/eu-health-regulator-says-covid-pandemic-not-over/94342502?action=profile_completion&utm_source=Mailer&utm_medium=newsletter&utm_campaign=ethealth_news_2022-09-22&dt=2022-09-22&em=a2FzdHVyaXNodWtsYTE4QGdtYWlsLmNvbQ==. [Last accessed on 2022 Sep 24].
 23. Nazir F, Rouf A, Masoodi MA. Awareness, attitude and practice of COVID-19 and its vaccination in J and K, India. *Indian J Forensic Community Med* 2021;8:220–6.
 24. Gutu B, Legese G, Fikadu N, Kumela B, Shuma F, Mosisa W, et al. Assessment of preventive behavior and associated factors towards COVID-19 in Qellam Wallaga Zone, Oromia, Ethiopia: A community-based cross-sectional study. *PLoS One* 2021;16:e0251062.
 25. Kumar A, Praveena PK, Barik RR. Adherence to COVID-19 appropriate behaviour among small scale workers in the unorganized sector in Rajasthan by applying health belief model and generalized social beliefs. *Int J Community Med Public Health* 2021;8:2805–11.
 26. Ransing R, Kar SK, Menon V. Potential barriers to handle the second wave of COVID-19 in India. *JGCR* 2021;8:36.
 27. Jain VK, Iyengar KP, Ish P. Elucidating causes of COVID-19 infection and related deaths after vaccination. *Diabetes Metab Syndr* 2021;15:102212.
 28. Saleem SM, Jan SS. Modified Kuppaswamy socioeconomic scale updated for the year 2019. *Indian J Forensic Community Med* 2019;6:1–3.
 29. Braun V, Clarke V. Using thematic analysis in psychology. *Qual Res Psychol* 2006;3:77–101.
 30. Chen X, Chen H. Differences in preventive behaviors of COVID-19 between urban and rural residents: Lessons learned from a cross-sectional study in China. *Int J Environ Res Public Health* 2020;17:4437.
 31. Parija SC, Chandrakumari AS. Challenges in the implementation of COVID-appropriate behavior. *J Basic Clin Appl Health Sci* 2021;4:31.
 32. Hossain MB, Alam MZ, Islam MS, Sultan S, Faysal MM, Rima S, et al. Do knowledge and attitudes matter for preventive behavioral practices toward the COVID-19? A cross-sectional online survey among the adult population in Bangladesh. *Heliyon* 2020;6:e05799.
 33. Tasnim S, Hossain MM, Mazumder H. Impact of rumors and misinformation on COVID-19 in social media. *J Prev Med Public Health* 2020;53:171–4.
 34. Mabiyan R. Rising cases of elderly with symptoms of Alzheimer's disease post COVID. *The Economic Times-ET Healthworld.com*. September, 2022. p. 21. Available from: https://health.economicstimes.indiatimes.com/news/diagnostics/elderly-covid-survivors-likely-to-develop-alzheimers-within-a-year-says-new-study/94198303?action=profile_completion&utm_source=Mailer&utm_medium=newsletter&utm_campaign=ethealth_news_2022-09-18&dt=2022-09-18&em=a2FzdHVyaXNodWtsYTE4QGdtYWlsLmNvbQ==. [Last accessed on 2022 Sep 23].
 35. PTI. Covid-19 infection increases risk of blood clots for one year: Study. EHealth News Network. September 21, 2022. Available from: https://health.economicstimes.indiatimes.com/news/industry/covid-19-infection-increases-risk-of-blood-clots-for-one-year-study/94350738?action=profile_completion&utm_source=Mailer&utm_medium=newsletter&utm_campaign=ethealth_news_2022-09-22&dt=2022-09-22&em=a2FzdHVyaXNodWtsYTE4QGdtYWlsLmNvbQ==. [Last accessed on 2022 Sep 23].
 36. Jain VK, Iyengar K, Garg R, Vaishya R. Elucidating reasons of COVID-19 re-infection and its management strategies. *Diabetes Metab Syndr* 2021;15:1001-6.