

# Assessment of knowledge gaps and perceptions about COVID-19 among health care workers and general public-national cross-sectional study

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## Abstract

**Background and Aims:** COVID-19 has impacted everyone's life and livelihood in one way or the other. Individual response to measures taken to control the rapid spread of this disease depend on their knowledge and perceptions. Hence, we proposed to evaluate responses about COVID-19 among the health care workers (HCWs) as well as general public participants (GPPs).

**Material and Methods:** This was a cross-sectional, observational survey conducted during the peak of the pandemic. The 35-items questionnaire was prepared using Google forms and distributed through e-mails and social media.

**Results:** The 1,026 responses comprised of 558 HCWs (54.4%) and 468 GPPs (45.6%). The most reliable source of information was TV news for 43% GPPs, whereas it was HCWs/Local health authorities for 36.8% HCWs. HCWs had sufficient knowledge regarding COVID-19, while it was relatively low among GPPs (average correct response 65% and 53%, respectively). Intra-group analysis with respect to age, sex, qualification, and socioeconomic status showed that knowledge about mode of transmission by airborne aerosols was significantly low with respect to qualification among GPPs while younger age group (<40 years) HCWs had significantly more knowledge about mode of transmission and asymptomatic carriers. Paranoia of contracting the infection was significantly higher in GPPs with upper and middle socioeconomic status and younger HCWs.

**Conclusion:** HCWs had moderate level of knowledge, whereas GPPs had low to moderate knowledge, with large scope of improvement in both groups. Continued education, both at professional and community level will not only be helpful but also necessary to improve knowledge, avert negative attitudes and control the devastating pandemic.

**Keywords:** COVID-19, health care workers (HCWs), India, KAP, knowledge gaps, perceptions

## Introduction

The novel coronavirus infection has been spreading worldwide, involving all continents and reeling millions of people under its harmful effects. On December 31, 2019, China reported a cluster of pneumonia cases initially thought to be of unknown etiology but later identified as a deadly virus belonging to the

SARS group-severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) now called COVID-19.<sup>[1]</sup> Due to the exponential rise in the number of infected cases and mortality all over the globe, WHO declared it a pandemic on March 11, 2020.<sup>[2]</sup> Till now there have been more than 6.5 million cases from over 213 nations, with more than 3.8 lakh deaths and numbers still rising.<sup>[3]</sup> This pandemic has influenced global health, economy, lifestyle, international harmony,

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along with spread of misinformation and panic in the world. This pandemic has also brought the importance of infection prevention and control practices to the forefront.

At this moment, the increasing number of infected cases implies that we are still delusive of effective strategies to control the pandemic. Thus, studies are needed to access the felt needs of society to uncover any knowledge gaps and understand the societal perceptions. As it is known that extensive time is needed to collect data via telephonic surveys and it is not possible to conduct household surveys during this rapidly spreading infectious pandemic, online conducted surveys offer a promising method to reach the people. Hence, the present study was planned to evaluate the knowledge, attitudes and perceptions of the general public and the HCWs during the COVID-19 pandemic, so as to strengthen the health education, prevention policies of government, and assist stakeholders in controlling this pandemic.

## Material and Methods

### Study population

This was a cross-sectional, observational, web-based survey conducted during the peak of the pandemic. The participants included HCWs and general public participants (GPPs) of age more than 18 years, who understood English language, had access to internet, and were willing to take part in the survey. HCWs included doctors, nurses, and para-medical staff. On clicking the link, the participants got auto-directed to the message regarding the purpose of the study and the consent form appended to it. In the message the participants were assured of the confidentiality of their responses and were encouraged to answer the questionnaire independently without consulting others.

### Survey instrument

The 35 item questionnaire on the COVID-19 pandemic was prepared using Google forms, a tool that allows collecting information from users via a personalized survey sheet. This questionnaire was prepared after literature reviews based on information collected from CDC,<sup>[4]</sup> Atlanta and Ministry of Health and Family Welfare (MoHFW), India<sup>[5,6]</sup> and group interviews with HCWs and general public. The final version was pilot tested by sending it randomly to 10 people, to access the comprehension and clarity of questions. The feedback from the responders was incorporated into the survey instrument. It was divided into three sections: (i) D1-5 questions on demographic information, (ii) K1-15 questions about knowledge of all the domains of the virus characteristics, modes of transmission, disease symptoms, prevention strategies, and (iii) 15 questions regarding attitude (A1-6) and perceived efficacy of preventive measures and perceptions (P1-9) regarding the effect of the pandemic

on participant's day to day life. All the questions were based on a multiple-choice format with single correct answer. For a few questions on perception multiple answers were allowed.

### Survey distribution

The web-link questionnaire was sent through e-mails and social media randomly to all contacts of the investigators during the first week of May, 2020. The authors had database of medical professionals/HCWs, from their previous study, to whom the link of the survey was also forwarded.<sup>[7]</sup> Two reminders to complete the survey were sent on alternate days to improve the response rate. The participants were encouraged to roll out the survey to as many contacts as possible so as to include participants with diverse demographic characteristics and professions from all over India.

### Data analysis

The information collected from the responders was automatically arranged in a spreadsheet. The analysis and comparison of the responses of the general public and the HCWs was done through Microsoft Excel to obtain results. Data was recorded, tabulated, and statistically analyzed using SPSS version 21, Armonk, NY: IBM Corp. Descriptive analysis was applied to calculate frequencies, percentages, and proportions; Chi-square test was used to find the level of association among the variables. A *P* value of  $\leq 0.05$  was considered statistically significant.

## Results

This online survey was completed by 1,026 people, comprising of an almost equal number of HCWs (558; 54.4%) and GPPs (468; 45.6%). Nearly 52% of the participants belonged to the productive young age group of 20–40 years. The study population consisted of 560 (54.6%) male and 466 (45.4%) female participants. Most of the participants had a professional degree (52% GPPs, 62% HCWs) followed by graduates (36% GPPs, 23% HCWs). Distribution of demographic characteristics among the study participants and socio-economic status, calculated using Kuppuswamy scale (modified 2019)<sup>[8]</sup> is depicted in Table 1 and geographical distribution is depicted in Figure 1.

### Source of information

Most of the GPPs considered TV news channels (43%), followed by Google News apps (18.8%) as the reliable source of information, whereas 37% HCWs considered information from HCWs/Local health authorities followed by TV channels (24.6%) and Google/internet/news apps (20%) as reliable source of information, as shown in Figure 2A. Overall only 8% reported that they relied on social media for information related to COVID-19 infection.

**Table 1: Demographic distribution of study participants**

No	Characteristics	GPP (n=468)	HCW (n=558)	Total (n=1026)	
D1.	(Age years)	<20	39 (8%)	53 (9%)	92
		20-30	85 (18%)	249 (45%)	334
		31-40	88 (19%)	117 (21%)	205
		41-50	90 (19%)	94 (17%)	184
		51-60	72 (15%)	33 (6%)	105
		>60	94 (20%)	12 (2%)	106
D2.	Gender	Female	165 (35%)	301 (54%)	466
		Male	303 (65%)	257 (46%)	560
D3.	Qualification	Professional degree	242 (52%)	347 (62%)	589
		Graduate	169 (36%)	127 (23%)	296
		Intermediate/Diploma	15 (3%)	50 (9%)	65
		High school	35 (7%)	31 (6%)	66
		Middle school	5 (1%)	1 (0%)	6
		Primary school	2 (0%)	2 (0%)	4
D4.	Occupation	Professional	237 (51%)	418 (75%)	655
		Semi-Professional	26 (6%)	25 (4%)	51
		Retired from Job	68 (15%)	3 (1%)	71
		Clerical/Shop-owner	21 (4%)	4 (1%)	25
		Skilled Worker	15 (3%)	12 (2%)	27
		Unskilled Worker	4 (1%)	6 (1%)	10
		Unemployed	97 (21%)	90 (16%)	187
D5.	Monthly Income (in INR)	>52,734	244 (52%)	243 (44%)	487
		26,355-53,733	77 (16%)	91 (16%)	168
		19,759-26,354	26 (6%)	40 (7%)	66
		13,161-19,758	21 (4%)	40 (7%)	61
		7,887-13,160	14 (3%)	30 (5%)	44
		<7886	86 (18%)	114 (20%)	200
Socio Economic status		Upper Class	198 (42%)	283 (51%)	481
		Upper middle	171 (37%)	179 (32%)	350
		Lower middle	24 (5%)	19 (3%)	43
		Upper Lower	75 (16%)	77 (14%)	152
Total		468 (100%)	558 (100%)	1026	

General knowledge and awareness about COVID-19 [Table 2]:

### Source of infection and mode of transmission

Animal source as the source of virus was considered by 47% HCWs and 34.2% GPPs, whereas many participants considered COVID-19 to be a biological weapon (38% GPPs; 41% HCWs), as shown in Figure 2B. Correct response about the survival of virus on surfaces was given by only 59% GPPs and 62% HCWs. The knowledge of the incubation period of the virus on the basis of which quarantine period is practiced was lower in GPPs (56%) than HCWs (76.7%). Both the groups were well aware of the mode of transmission of corona virus by contact with contaminated objects (92% HCWs; 85% GPPs). However, only 64% HCWs and 42.3% GPPs considered airborne aerosols as the other mode of transmission [Figure 3a]. Similarly, awareness about asymptomatic carriers, being able to spread infection, was more in HCWs (87.6%) than in GPPs (68.8%).

### Symptoms and clinical presentation

The most common symptoms of the COVID-19 infection were well known to both the groups (72% HCWs; 73% GPPs). However, atypical presentation of COVID-19 infection in the form of gastrointestinal symptoms and neurological symptoms was lesser known to the GPPs as compared to the HCWs. Current mortality rate in India was correctly and equally reported by both the groups (83% HCWs; 87% GPPs).

### Attitude of participants about the disease [A1-6]

On developing symptoms related to COVID infection, approximately 78% GPPs and 87% HCWs wisely reported that they would immediately isolate themselves. Further regarding the management, 52% GPPs and 44% HCWs would consult a family physician whom they trust and nearly 27% GPPs and 30% HCWs would first get themselves tested for COVID-19 [Table 3].

Nearly 69% HCWs reported that disposal of facemasks, hand sanitizer bottles, gloves, etc. was done by them in accordance with bio-medical waste disposal guidelines, whereas approximately 38% GPPs reused these items after washing/sterilizing, another 31% disposed them along with household waste and other 30% dumped or burnt them, probably in the absence of any clear-cut guidelines.

It was heartening to know that 81% GPPs and 76.5% HCWs had a positive change in their attitude toward the frontline warriors (police personnel and HCWs) during the pandemic [Table 3]. Fear and apprehensions of being infected during this pandemic was reported by 64% GPPs and 67% HCWs, whereas some participants (18.8% GPPs; 15% HCWs) worried about the financial loss incurred during the lockdown.

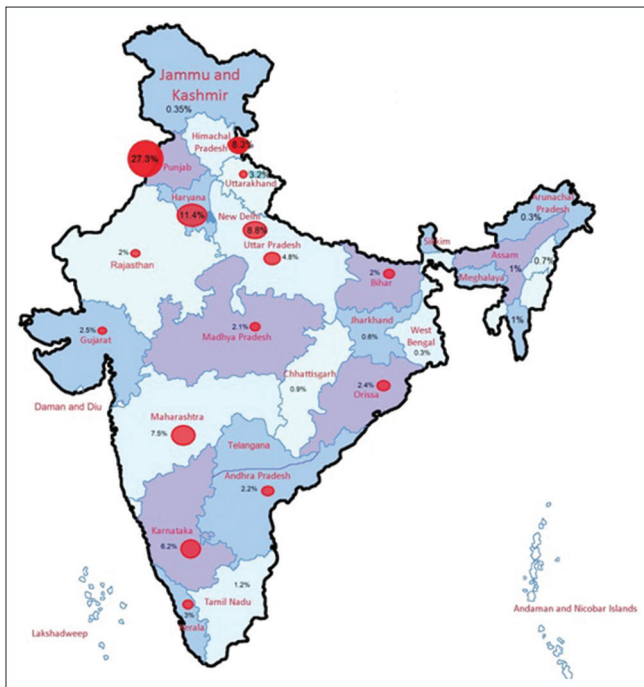


Figure 1: Geographical distribution of the survey response from all over India

Only 10% participants in each group considered that there was unnecessary panic created by electronic and social media.

**Lifestyle modifications**

Many participants (52% GPPs; 61% HCWs) modified their dietary habits with increased the intake of fruits to boost immunity during the pandemic. Some increased the intake of herbal tonics and vitamins, whereas others took the major step to turn vegans. Most of the participants (69% GPPs; 68% HCWs) stated that spending time with family as the most positive impact of lockdown. Self-isolation (45% GPPs and 36.6% HCWs) and public education (41.5% GPPs and 57.1% HCWs) were the preferred ways through which participants hoped to play a positive role as responsible citizens. Participants also considered increase in personal hygiene and attention to health issues (44.4% GPPs; 53% HCWs) and being more helpful to needy/HCWs/Police personnel (24% GPPs; 22.4% HCWs) as the most important change in their day to day behavior.

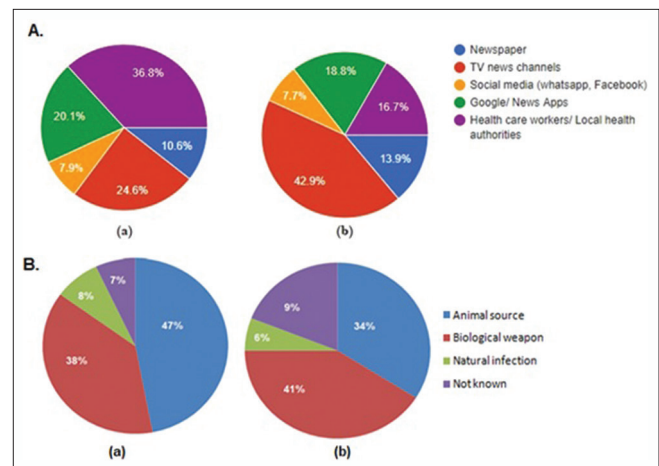


Figure 2: Response rate in percentage with respect to (A) most reliable source of information of COVID-19 (B) Most probable source of COVID-19 among the (a) Health Care Workers (b) General Public Participants

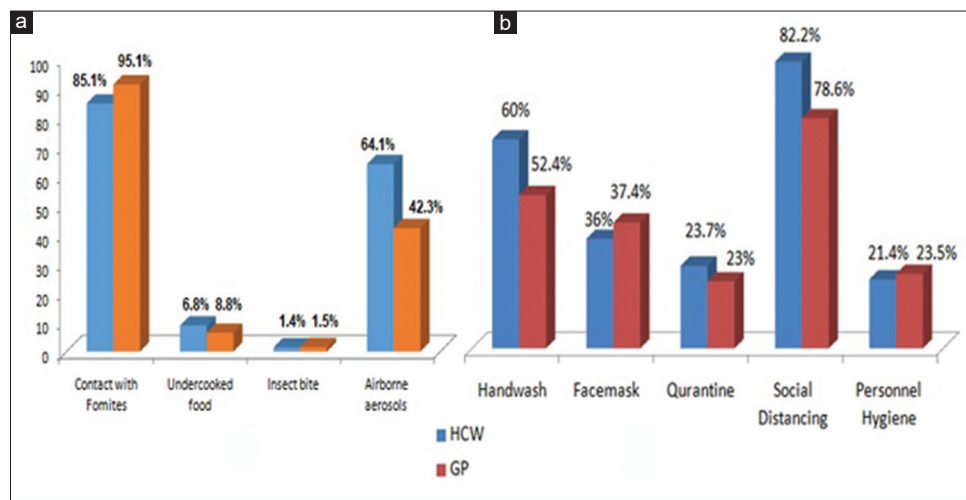
**Table 2: Percentages of correct responses regarding knowledge and awareness about Novel corona virus (COVID-19) among the participants**

S No.	Questions regarding knowledge and awareness	GPP (n=468)	HCW (n=558)	P
K1.	Animal source of COVID-19 pandemic	160 (34.2%)	262 (47%)	0.0001
K2.	The virus survives on surfaces for 1-7 days	275 (58.8%)	345 (61.9%)	0.337
K3.	Incubation period of the virus	260 (55.5%)	427 (76.7%)	0.0001
K4.	Transmission by Contact with contaminated objects	429 (91.7%)	474 (85.1%)	0.001
K5.	Mode of transmission of infection by airborne aerosols	198 (42.3%)	357 (64.1%)	0.0001
K6.	Asymptomatic carriers can spread infection	321 (68.8%)	488 (87.6%)	0.0001
K7.	Other name of COVID-19	193 (41.2%)	383 (68.8%)	0.0001
K8.	Most common symptoms of COVID-19	343 (73.3%)	401 (72%)	0.57
K9.	Can present as GI symptoms	105 (22.4%)	265 (47.6%)	0.0001
K10.	Can present as neurological symptoms	38 (8.1%)	123 (22.1%)	0.0001
K11.	Current death rate in your country	407 (87%)	462 (82.9%)	0.53
Overall correct response		53%	65%	



**Table 3: Attitude responses and Perceptions of participants about Novel corona virus (COVID-19) infection**

No.	Attitude responses regarding COVID -19 infection	GPP (n=468)	HCW (n=558)
A1.	Fear and anxiety on developing symptoms like COVID infection	50 (10.7%)	41 (7.4%)
A2.	Isolate yourself on developing symptoms like COVID infection	364 (77.8%)	485 (87%)
A3.	Consult family physician first on developing symptoms like COVID infection	241 (51.5%)	245 (44%)
A4.	Get tested for COVID-19 on developing symptoms like COVID infection	43 (9.2%)	38 (6.8%)
A5.	Positive attitude towards HCW/police personnel	380 (81.2%)	426 (76.5%)
A6.	No change towards HCW/police personnel as they are doing their job	10 (2.1%)	13 (2.6%)
No.	Perceptions regarding COVID -19 infection	GPP (n=468)	HCW (n=558)
P1.	HCW at highest risk of COVID-19 infection	340 (72.6%)	424 (76.1%)
P2.	Maternal transmission of virus during delivery	69 (14.7%)	118 (21.2%)
P3.	Increased intake of fruits helps to boost immunity against COVID 19	242 (51.7%)	337 (60.5%)
P4.	Vaccine will be the best strategy for control of this epidemic	219 (46.8%)	251 (45.1%)
P5.	Future of the COVID-19 pandemic can't be predicted	236 (50.4%)	264 (47.4%)
P6.	COVID-19 will stay in community as a endemic infection	111 (23.7%)	175 (31.4%)
P7.	Pandemic will be eradicated by end of this year	90 (19.2%)	83 (14.9%)
P8.	Pandemic will recur after few years	31 (6.6%)	35 (6.3%)
P9.	Satisfaction towards strategies implied by govt.& health authorities	263 (56.2%)	260 (46.7%)

**Figure 3:** Response with respect to (a) mode of transmission (b) perceptions about effective strategies for prevention of spread of COVID -19 infection

### Perceptions about COVID-19 infection [P1-9]

The third part of the questionnaire accessed the perceptions of the participants [Table3]. 73% GPPs as well as 76% HCWs perceived frontline HCWs at the highest risk of COVID-19 infection as compared to general public, police personnel, and sanitation workers. Social distancing/lockdown was perceived as the best method (78.6% GPPs; 82.2% HCWs) for prevention of infection followed by handwashing (52.4% GPPs; 60% HCWs). Only 36% HCWs and 37% GPPs responded that facemask was a necessary strategy to prevent spread of infection [Figure 3b].

Approximately half of the participants (50.4% GPPs; 47.4% HCWs) perceived that future of the COVID-19 pandemic was unpredictable as nations, states, and cities show larva curve with each passing day, whereas 24% GPPs and 31% HCWs believed that COVID-19 would

stay in community as endemic infection. Nearly half of the participants in each group were optimistic that vaccine, once developed could be the most effective strategy to control the pandemic. About 35% of the participants considered being quarantined/isolated, as an effective means to control the pandemic; while 18% participants considered development of herd immunity would be effective to end the pandemic.

Approximately 56% GPPs and 47% HCWs were satisfied by the policies and decisions by government and health agencies for control of COVID infection. Control of air and water pollution (51.3%), ban on animal trafficking and slaughtering (13.8%) and control of population growth (17%) were perceived as some of the practices that should continue for long, even after the pandemic was over, to save and nurture better survival of mankind on Earth.

### Comparison of knowledge and perceptions about COVID-19 with demographic variables

Intra-group analysis of both the groups was done to assess the knowledge, perceptions, and attitudes with respect to age, gender, qualification, and socioeconomic status (SES), after selecting eight questions from the questionnaire [Table 4]. Among GPPs, knowledge about mode of transmission by airborne aerosols was significantly low with respect to qualification. But knowledge about virus sustaining on surfaces was statistically significantly higher in GPPs with higher qualification and SES. Positive attitude about HCWs, police personnel and other frontline workers was least in GPPs with lower SES than in upper SES. Paranoia of contracting the infection was significantly higher in GPPs with upper and middle SES.

Younger age group (<40 years) HCWs had significantly more knowledge about mode of transmission and spread of infection through asymptomatic carriers. Also, knowledge that virus can remain on surfaces for 7 days was significantly more in female HCWs, professional degree holders and participants with upper SES. It is also observed that the younger HCWs had significantly higher perception of being at risk of getting infected, believed that isolation of patients and suspects was the best strategy to control the epidemic and were more satisfied with government policies.

### Discussion

India currently has the largest number of confirmed cases of COVID-19 in Asia, with the number crossing 100,000 on 19<sup>th</sup> May and 200,000 on 3<sup>rd</sup> June.<sup>[9]</sup> Highly contagious nature of this disease has startled the whole world and mobilized everyone to eagerly find effective ways for control of this pandemic.

Hence, it is crucial to assess the knowledge gaps and the perceptions of the society as well as HCWs and provide them with awareness and information about effective prevention strategies.<sup>[10]</sup>

Unfortunately along with the COVID-19 pandemic there is a global epidemic of misinformation, termed as “Infodemic” by the World Health Organization Director General, Dr Tedros Adhanom Ghebreyesus.<sup>[11]</sup> In the presettn study, news channels were considered the most reliable source of information by GPPs, whereas HCWs relied on information from HCWs/local health authorities whereas both groups regarded social media as the least reliable. A study from Uganda also suggested that knowledge on COVID-19 was higher among those HCWs who used information from international and governmental news-media,<sup>[12]</sup> whereas in another study 91% HCWs used social media for information

**Table 4: Intra-group analysis of both GPPs and HCWs to assess the knowledge, attitudes and perceptions with respect to age, gender, qualification and socio economic status (SES) of eight questions from the questionnaire**

Characteristics → Questions ↓	General Public Participants -GPP						Health Care Workers -HCW																					
	Age (years)		Gender		Socio-Economic Status		Age (years)		Gender		Socio-Economic Status																	
	<40	>40	F	M	Upper	Middle	Lower	<40	>40	F	M	Upper	Middle	Lower														
Mode of transmission by airborne aerosols	93	105	0.53	72	1260	0.66	101	68	29	0.03	83	78	37	0.37	254	103	0.004	188	169	0.41	241	71	45	0.36	196	105	56	0.00
Asymptomatic carriers can spread infection	143	178	0.63	111	2100	0.65	172	109	40	0.35	141	129	51	0.55	357	131	0.005	272	216	0.02	323	99	66	0.00	253	162	73	0.00
Virus remains on surfaces 1-7 days	117	158	0.15	98	1770	0.83	154	95	26	0.03	128	111	36	0.03	251	94	0.10	175	170	0.05	228	71	46	0.05	189	108	48	0.02
Perception about HCWs are at the highest risk of getting infected	155	185	0.83	115	2250	0.29	180	119	41	0.66	141	143	56	0.81	310	114	0.05	219	205	0.05	265	96	63	0.96	233	135	56	0.00
Satisfied with govt. policies	118	145	0.83	98	1650	0.30	129	99	35	0.39	107	116	40	0.47	206	54	0.03	141	119	0.8	157	65	38	0.49	126	102	32	0.20
positive attitude towards HCWs	165	215	0.09	130	2500	0.32	199	141	40	0.07	164	164	52	0.01	321	105	0.79	223	203	0.17	262	102	62	0.46	209	164	53	0.02
Isolation as the best strategy to control pandemic	74	94	0.68	64	1040	0.33	91	50	27	0.03	72	63	33	0.19	154	37	0.02	112	79	0.10	109	44	38	0.05	85	82	24	0.02
Negative effect as being always in fear	116	123	0.15	80	1590	0.40	134	80	25	0.14	113	86	40	0.03	244	80	0.88	175	149	0.16	198	68	58	0.14	160	111	53	0.1

about COVID-19.<sup>[13]</sup> It is important for masses to know that rumors spread fast via social media to unconfined numbers as opposed to scientific information that is handled by few.

Our results demonstrate that HCWs had an average correct response rate of 65% about the knowledge of the newly detected virus, whereas it was 53% among the GPPs. Among the HCWs, there was a positive relation between the knowledge and education level, implying that these professionals regularly updated themselves while paramedics were still in the process of learning and lagged behind. Limited access of information for the paramedics and staff along with their busy working schedule may be reason for this lag. Similarly, there was significant lack of information among the HCW and general public regarding the aerosol transmission, more so in the undergraduates and lower socioeconomic strata. Early reports from China suggested that COVID-19 spreads through respiratory droplets and fomites, but airborne transmission was not reported.<sup>[14]</sup> However, asymptomatic patients producing aerosols during breathing and coughing is posing a major challenge in continuing the chain of the pandemic.<sup>[15]</sup> In such situations, it is devastating for the general public to underestimate the role of asymptomatic carriers and aerosol spread. Although our health authorities like ICMR have been consistently disseminating information regarding factors influencing the spread and prevention strategies since the disease was initially known, these need to be scaled up to create more public awareness.<sup>[16]</sup> A study among 327 HCWs from China reported that majority had good knowledge (67% knew about the mode of transmission and 65.8% about isolation period) and two thirds had positive attitude toward COVID-19 illness.<sup>[13]</sup> Another study among Chinese residents in Hubei province observed that residents of relatively high SES, particularly women, had good knowledge, appropriate practices and optimistic attitudes towards COVID-19.<sup>[17]</sup> But these results need to be viewed with caution because although China had the origin of the pandemic, these studies were conducted very early (last week of January) when scientifically little was known about the novel corona virus.

It has been reported that compared with the general community, frontline HCWs have 11.6 times higher risk of being tested positive.<sup>[18]</sup> However, according to a study by ICMR it was observed that HCWs are 33 times higher risk of being infected with COVID-19.<sup>[19]</sup> The findings of our study also highlight the increasing awareness that HCWs are not only at the forefront in fighting against this highly contagious disease but they are at significant risk of contracting infection as compared to the general population. In coherence with this, about three fourths of the participants expressed HCWs and other frontline workers as being more respectable and their saviors. They also expressed confidence in the medical field that vaccine once developed would bring end to this pandemic

and a quarter of them were willing to undergo a trial for the same.

Both the groups in this study have expressed positive attitude toward strategies used by the government for prevention of COVID-19 transmission like social distancing and lockdown, irrespective of the demographic variation. This is an important finding where people have shown confidence in the authorities unlike study from Bahrain where the public were supportive to the authorities for control of swine-flu epidemic but thought that they were not given sufficient information from the local media.<sup>[20]</sup> However with time, fatigue may set in the minds of people and relaxation of the lockdown by the government at various places may give a false sense of security to the people. Hence, reinforcement from the authorities must continue till the pandemic is controlled.

The anxiety levels identified in the study were high, with fear of contracting infection as the most common cause of stress in participants. With an overwhelming number of new cases and fatalities every day, another study from India has reported that about 80% responders had sleep difficulties, paranoia about acquiring infection and were preoccupied with the thoughts of COVID-19. Similar to our results, it also reports people's willingness to follow government guidelines.<sup>[21]</sup> To overcome this stress, the participants in this study have admitted that although lockdown had brought life to a standstill, they had brought major changes in their lifestyle including spending time with family, pursuing hobbies, educating public and following dietary modifications.

Surveys capture the societal knowledge and perception at that moment of time and this experience of pandemic and lockdown should make us wiser for future. Although in a pandemic situation what seems to be true today, may be wrong tomorrow but we need to know the baseline knowledge and perception, to estimate the change with time. Perceptions may change but preventive strategies will surely remain relevant and will have to be strengthened in order to fight this pandemic.

The strength of our study is the large sample size but there are certain limitations. Lack of data collection from the poor and rural inhabitants because of inaccessibility to internet and social media limits the generalization of our results.

## Conclusion

The results show that HCWs had moderate level of knowledge, whereas GPPs had low to moderate knowledge about the COVID-19 infection and its preventive aspects, with large scope of improvement in both the groups. This study emphasizes the need to intensify the awareness program by community-based

health education program, particularly among lower SES and training of HCWs, particularly the paramedics. Reliable information should be disseminated by authorities through internet, television and newspapers on which they rely most. With the willingness of the people to follow government guidelines, combined with the efforts of authorities and citizens we hope to win the fierce battle against COVID-19 in near future.

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### Conflicts of interest

There are no conflicts of interest.

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Supplementary Information is linked to the online version of the paper on the *Journal of Anaesthesiology Clinical Pharmacology* website



## Appendix 1

### COVID-19 Questionnaire developed into Google survey

Name (optional)

State

#### Section 1 -Demography

1. Age group- <20 years; 20-30; 30-40; 40-50; 50-60; >60 years
2. Sex-male/female
3. Education – Professional degree; Graduate; Intermediate/Diploma; High school; Middle school; Primary school
4. Occupation- Professional; Semi-Professional; Retired from Job; Clerical/ Shop-owner; Skilled Worker; Unskilled Worker; Unemployed
5. Income- >52,734  
26,355-53,733  
19,759-26,354  
13,161-19,758  
7,887- 13,160  
<7886

**Health worker** (doctor, nurse, paramedical staff) – Yes/No

Q Which is the most reliable source for update of COVID-19 infection cases according to you?

- a. Newspaper
- b. TV news channels
- c. Social media (whatsapp, Facebook)
- d. Health care workers

#### Section 2 - Knowledge

K1. What do you think is the source of this COVID-19 pandemic?

- a. Natural cause
- b. **Animal source**
- c. Biological weapon
- d. Source not known

K2. How long does the virus survive in the environmental air?

- a. Hours (6-8 hours)
- b. **Days (2-5 days)**
- c. Months (1-2 months)
- d. Years (1-2 years)

K3. What is the incubation period of the virus?

- a. >21 days
- b. **2-14 days**
- c. 7 days
- d. > 14 days

K4. Is the virus transmitted through airborne aerosols?

**Yes/no/I don't know**

K5. Is that the virus is transmitted via contact with contaminated objects?

**Yes/no/I don't know**

K6. Do you think there are “asymptomatic carriers” of this virus who can spread the infection?

**Yes/no/I don't know**

K7. What is the other name of COVID -19?

- a. MERS-CoV virus
- b. SARS-CoV virus
- c. **SARS-CoV2 virus**
- d. Don't know

- K8. What is the most common symptom of COVID-19?
- Fever, cough
  - Myalgias
  - Difficulty in breathing
  - All of the above**
- K9. Can the COVID-19 infection present as diarrhea, vomiting, gastrointestinal upset?  
**Yes/no/I don't know**
- K10. Can the COVID-19 infection present as neurological symptoms?  
**Yes/no/I don't know**
- K11. What is the current death rate (mortality rate) of COVID-19 infection in our country?
- <5% of the total infection**
  - 25% of the total infection
  - 50% of total infection
  - 90% of total infection

### Section 3 - Attitude and Perception

A1 and A2

- Q If you develop fever, cough, sore throat- what will be your first reaction?
- Fear and anxiety
  - Exploring alternative (non-medical) modes of treatment
  - Not disclose to members outside the family
  - Isolate yourself from the family

A3 and A4

- Q If you develop fever, cough, sore throat- what is the first thing you would do?
- Go to hospital
  - Immediately consult family physician (phone)
  - Stay at home and self - medicate
  - Get yourself tested for COVID-19
- Q. What is the best strategy for prevention of spread of corona virus in the community? (TWO correct options)
- Hand washing
  - Using facemask
  - Quarantine
  - Social distancing/lockdown
  - Personal hygiene
- Q. How do you dispose your Facemasks, gloves, sanitizer bottles or caps after use?
- Dispose along separate from household waste.
  - Dump in ground or burn your Facemasks, gloves, sanitizer bottles or caps after use
  - Reuse Facemasks, gloves, sanitizer bottles or caps after use
  - Dispose according to biomedical waste guidelines in the hospital
- Q. What you think is your contribution/role in the control of the pandemic of COVID-19 as a responsible citizen?
- Isolate myself and my family to prevent the spread of infection
  - Helping the NGOs and social workers
  - Monetary contribution
  - Educate the people about social distancing and isolation

A5 and A6

- Q How has your attitude towards "health care worker/police personal" changed during this COVID-19 infection?
- Positively, as they are working as saviors for the community
  - Negatively, as they can get infected and further spread the infection
  - No change in attitude, always respected them
  - No change in attitude as they are just doing their job

- P1. According to you, who has the highest risk of COVID-19 infection?
- General public
  - Health care worker
  - Police officers
  - Sanitation workers and rag pickers
- P2. Is the virus transmitted from mother to child at time of delivery?  
Yes/no/I don't know
- P3. What change have you brought in your food pattern during this pandemic?
- Shifted to all vegetarian food
  - Increases intake of fruits to boost your immunity
  - Started taking Herbal tonics and Vitamins
  - No change in dietary pattern
- P4. Which will be the best strategy for effectively controlling this pandemic according to you?
- Herd immunity
  - Vaccine for COVID-19/Medicines for COVID-19(if developed)
  - Being Quarantined/Isolated
  - COVID-19 infection cannot be controlled
  - Alternate medication
- P5-P8
- Q What do you think will be future of this pandemic of COVID-19?
- The pandemic will reoccur after few years
  - It will stay in our community forever as low-grade infection (endemic)
  - Will be eradicated from our community by end of 2020
  - Cannot be predicted
- Q. What is the most positive impact of COVID -19 pandemic on your life? (TWO best options)
- Enjoying and spending time with my family
  - Relaxing from work/doing work from home
  - Finishing my pending work
  - Showcasing your hobbies which you never got opportunity or time to do so
  - Spending time in Yoga and meditation
- Q. What is the most negative impact of lockdown on your life?
- Anxiety and anger
  - Feeling economical rundown
  - Frustration and depression
  - Apprehensive about studies of the children
- Q. What is your most feared apprehension during this pandemic? (one best option)
- Financial loss
  - You or your family being affected with virus
  - Short term life goals to be achieved in near future could not be completed
  - No apprehension, it is an unnecessary panic created in the society
- P9. In your opinion are the policies and decisions made by state and central government for control of this COVID infection adequate?
- Strongly agree
  - Agree
  - Disagree
  - Strongly disagree
  - Can't say