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Response and behaviors of West Bengal population towards Covid-19: An observational study

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ABSTRACT

Background: India observed asymptomatic Covid-19 in high frequency from the beginning of the pandemic. This, when added to the high burden of false negative (indeterminate) cases and the poor rate of testing (RTPCR), swelled the numbers of unreported Covid cases in the country. There is dearth of comprehensive data on the socio-demographic differences, symptoms, exposures, comorbidities, medications, preventive and testing behavior of Covid patients. **Method:** A online observational cross-sectional study was done in West Bengal using a snowball sampling method on a Google form. The collected data were classified into four groups, symptomatic and asymptomatic Covid, query-Covid (subjects having symptoms who did not test) and indeterminate group (subjects with symptoms who tested negative). And their differences were statistically analyzed. **Results:** Our data showed contact at public gatherings and direct contacts with Covid-affected patients are major mode of transmission. The query-Covid and indeterminate group displayed less severe symptoms. Overall, multivitamins and vitamin-C were most commonly used for prevention. However, the query-Covid, and indeterminate group predominantly followed homeopathic preventive formulations; they also tended to practice self-medication seeking advice from social sources than doctors. They isolated themselves far less compared to Covid-patients. The behavior of refuting diagnostic tests in query-Covid and indeterminate cases were found related to less symptoms and a perception that test wasn't necessary. **Conclusion:** Our study indicates socio-demographic, symptoms, exposures, testing, treatment, prevention, mask wearing behavior among the symptomatic, asymptotic, query-Covid and indeterminate group. This helps to understand the reasons behind a huge burden of unreported Covid cases.

Keyword: Covid-19, unreported Covid, Rt-PCR, Snowball survey, Covid medications

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Introduction

The Covid-19, first ever reported to WHO on 31st December 2019, [1] moved out from Wuhan, China to reach India in January, 2020 at Kerala.[2] Kolkata, with a population density of more than 100,000/square Kilometer in some portion, [3] recorded its first Covid-19 case on March 15, 2020. [4] The city along with its Adjacent districts (North 24 Parganas, Howrah, Hooghly, South 24 Parganas) had to bear the brunt of maximum number of positive cases and burden of death of the state in first two waves of Covid-19. [5]

A symptomatically infected population sharing roughly 85% of the total cases was a major factor for the second wave Covid-19 in India; [6] it contributed to the spread of infection with an extended time-period. [7] Epidemiologists have indicated that there are about 30 unreported Covid-19 cases for a single positive case detected which has been reported in the fourth sero-survey of ICMR. [8, 9] Testing with real time PCR (RTPCR) for SARS-CoV-2 was also marred with challenges. Social discriminations, fear of isolation, forceful quarantine, and uncertainty during lockdown prompted many people not to test for Covid-19. [10, 11] The false negativity of RT-PCR, the gold standard test for determination of Covid-19 infection was also a crisis as it evolved out of several reasons, [12, 13] to contribute to the case load and spread of the disease. The scenario was further complicated by the traditional and social media that played as 'double edged sword' by raising awareness related to Covid-19 in one hand and prompting fear and anxiety on the other hand simultaneously[14, 15]. Internet became a hotspot for medical information which often was misleading and inadequate but were followed by masses. [16, 17]

Overall, there was a significant impact of Covid-19 on the mindset and reactions of population, however, any comprehensive and systematic assessment of the same is lacking. This led us to initiate a local online survey to understand the socio-demographic differences, Covid-19 exposures, symptoms, comorbidities, medications as well as precautions, preventions, testing, and treatment seeking behaviors of the participants.

Materials and Method

Research ethics approval: This research has been approved by institutional ethics committee ECR/159/ inst/WB/2013/RR-20.

This observational cross-sectional study was carried out in West Bengal focusing on Kolkata and its surrounding districts which had the highest reported Covid-19 positive cases during the first and the second waves of the disease in 2020 and 2021. A snowball sampling technique was adopted using a Google form-based questionnaire and been distributed via social media (WhatsApp, Facebook and Email). The responses were collected from 13th May 2021, 7 pm to 18 June 2021, 7 pm during the second Covid-19 wave in West Bengal. The forms were made in English and Bengali (regional language) and the respondents were encouraged to distribute the link (for the form) to their contacts. On clicking the form-link the participants were directed to an informed consent form. When participants approved the consent-form they could answer the questionnaires (28 questions-based).

The questionnaire (informed consent form followed by 28 questions) was developed by the authors on repeated interaction on electronic platform and it was ratified by a pulmonologist and a statistician before distribution. The survey included questions related to the socio demographic parameters like age, sex, education, occupation, place of residence and their blood groups in one hand and enquiry regarding the comorbidities, exposure history and symptoms related to Covid-19, testing history, use of mask and preventive medication along with medication used at symptoms, reasons of not undergoing any diagnostic test, source of the knowledge of medicine, and post Covid-19 complications.

Based on the responses, the participants were divided into four categories.

1. The first group was 'symptomatic Covid-19' consisting of respondents who had both symptoms for Covid-19 (fever, loss of taste, loss of smell, throat discomfort, sneezing, diarrhea, shortness of breath and body ache etc.) and the RTPCR test been positive for SARS-CoV-2.

2. The second group was named 'asymptomaticCovid-19' who did not have symptoms but tested positive in RTPCR. The third or the 'Query-Covid-19' group comprised of the participants who reported that they had combination of aforesaid symptoms related to Covid-19 during the first and/or the second wave of the disease, but they did not undergo any diagnostic test (Rapid Antigen Test or RT-PCR) and the last (fourth) category was the 'indeterminate' group comprising of the people who had the symptoms, but their RT-PCR test results were negative.

The data was analyzed using IBM SPSS version 26 software and GrapPAD Prism 8. Descriptive statistics and Chi-squared test of the socio-demographic parameters and Covid-19 related symptoms and behaviors were evaluated in GraphPad Prism 8. Multinomial Logistic regression was done to identify the significant variables and Adjusted odds ratios in each question related to Covid-19 among the different groups.

Results

Through the online survey, 2026 responses (above 18 years and capable of accessing internet) were recorded. Out of them, 45 responses were excluded for quality issues(incomplete response or duplicate responses). We collected the responses of 435 'symptomatic Covid-19,' 34 'asymptomatic Covid-19', 343 'query Covid-19' and189 'indeterminate' participants along with that of 980 healthy subjects who did not have any symptoms related to Covid -19 nor they tested positive during first and second wave.

Socio-Demographic data

Males predominate in all the groups having similar ratio with female respondents (table 1). Majority of the participants were aged between 18-30 years and 31-40 years followed by 41-50years in all the categories. The mean age of the symptomatic Covid-19, asymptomatic Covid-19, query-Covid-19 and the indeterminate groups are 40.95±14.48, 37.17±15.04, 34.64±13.28 and 35.65±12.84 years respectively. Thus, we see that higher aged persons have more chance to be affected by Covid-19 disease compared to the lower aged persons. More than 80% of the study population in each group held a qualification of graduation or above and were engaged in different occupations (mostly in private jobs) **(Table- 1).**

Table-1: Socio-demographic characterization of the Covid-19 symptomatic group (patients had symptoms and tested positive), Covid-19 asymptomatic (patients did not have symptoms but tested positive), query Covid-19 (respondents had symptoms but did not opt for testing) and indeterminate (respondents had Covid-19 like symptoms but tested negative).

		Symptomatic Covid-19		**Asymptomatic Covid-19**		**Query Covid-19**		**Indeterminate**		**χ^2 ; Df ; P value**
		n=435 (39.87%)		**n=34 (1.71%)**		**n=343 (17.31%)**		**n=189 (9.54%)**		
		No.	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	
Sex	Male	281	64.60	24	70.59	195	56.85	111	58.73	χ^2=6.57 Df=3.00 P=0.0868
	Female	154	35.40	10	29.41	148	43.15	78	41.27	
Age (yrs)	18-30	140	32.18	17	50.00	183	53.35	81	42.86	χ^2 =54.51 Df =18 P<0.0001
	31-40	97	22.30	4	11.76	55	16.03	52	27.51	
	41-50	71	16.32	5	14.71	51	14.87	27	14.29	
	51-60	78	17.93	5	14.71	38	11.08	18	9.52	
	61-70	36	8.28	2	5.88	14	4.08	9	4.76	
	71-80	12	2.76	1	2.94	2	0.58	2	1.06	
	> 81	1	0.23	0	0.00	0	0.00	0	0.00	
Mean Age ±SD (yrs)		40.95±14.48		37.17±15.04		34.64±13.28		35.65±12.84		P<0.0001
Education	Below Secondary	5	1.15	1	2.94	3	0.87	0	0.00	χ^2 =28.11 Df=15 P=0.0209
	2ndary education	1	0.23	0	0.00	9	2.62	0	0.00	
	Higher secondary Education	22	5.06	2	5.88	11	3.21	9	4.76	
	Graduation	190	43.68	21	61.76	160	46.65	82	43.39	
	Post-graduation	196	45.06	10	29.41	149	43.44	93	49.21	
	PhD	21	4.83	0	0.00	11	3.21	5	2.65	
Occupation	Student	72	16.55	6	17.65	111	32.36	45	23.81	χ^2 =46.32 Df=15 P=0.0012
	Government job	70	16.09	3	8.82	48	13.99	28	14.81	
	Private job	160	36.78	15	44.12	125	36.44	74	39.15	
	Doctors	16	3.68	2	5.88	9	2.62	4	2.12	
	Entrepreneurs/ Self Employed	54	12.41	2	5.88	19	5.54	21	11.11	
	Homemakers	33	7.59	3	8.82	20	5.83	12	6.35	
	Awaiting job	1	0.23	0	0.00	1	0.29	0	0.00	
	Retired	29	6.67	3	8.82	10	2.92	5	2.65	
Residence	Kolkata	199	45.75	10	29.41	74	21.57	78	41.27	χ^2 =13.95 Df=15 P=0.0302
	Districts around Kolkata (North 24 Parganas, South 24 Parganas, Howrah, Hooghly)	196	45.06	17	50.00	87	25.36	82	43.39	
	Other districts of West Bengal	40	9.20	7	20.59	34	9.91	29	15.34	

Our respondents had the highest prevalence of Blood Group B followed by O and A for symptomatic, query Covid and indeterminate group **(Supplementary Figure 1).**

Exposures, symptoms, and comorbidities

The history of direct contact with Covid-19 patients were significantly different (p<0.0001) among the groups with highest frequency in symptomatic Covid-19 followed by asymptomatic Covid-19 and indeterminate group. The workplace exposure was the perceived predominant source followed by public transport, and marketplace (see table 2). Both symptomatic and asymptomatic patients of Covid-19 had higher percentage of Covid-19 patients at home (Table 2) as compared to the other two (query-Covid-19 and indeterminate subjects)groups. Unknown source was roughly 20% in all but was the highest in asymptomatic Covid-19 (32.3%). The multinomial logistic regression, interestingly, revealed unknown source to have the highest risk (p<0.0001, Adj OR=11.11) for query Covid and the indeterminate cases (p value <0.0001, Adj OR=13.33) as compared to symptomatic Covid-19 patients. The query Covid-19 group on multinomial logistic regression had significantly higher exposure to marketplace (p<0.0001, Adj OR=2.06), or Covid-19 positive friend/ known people (p value <0.001, Adj OR=2.39). While indeterminate group had higher exposure to marketplace (p=0.003, Adj OR= 1.96), workplace (p<0.0001, Adj OR=2.02), friend/known people (p value<0.0001, Adj OR=2.07) and no known source (p <0.0001, Adj OR=13.33) compared to the symptomatic group **(Table-2).**

Table 2: The exposures, symptoms, and comorbidities among the Covid-19 symptomatic, Covid-19 asymptomatic, query Covid-19 and indeterminate group.

		Symptomatic Covid-19		**Asymptomatic Covid-19**		**Query Covid-19**		**Indeterminate**		**χ^2 ; Df ; P value**
		n=435 (39.87%)		**n=34 (1.71%)**		**n=343 (17.31%)**		**n=189 (9.54%)**		
		No.	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	
Direct contact with Covid-19 patient		259	59.54	20	58.82	123	35.86	104	55.03	χ^2=46.12 Df=3.00 P<0.0001
Exposure	Public transport	97	22.30	8	23.53	108	31.49	44	23.28	χ^2=160.9 Df =18 P<0.0001
	Market	86	19.77	8	23.53	106	30.90	53	28.04	
	Workplace	139	31.95	8	23.53	114	33.24	74	39.15	
	Friends/Known people	74	17.01	6	17.65	96	27.99	47	24.87	
	Covid-19 patients at home	99	22.76	8	23.53	33	9.62	28	14.81	
	Public gathering	32	7.36	0	0.00	38	11.08	20	10.58	
	None	79	18.16	11	32.35	68	19.83	33	17.46	
Symptoms	Fever	316	72.64	00	0.0	155	45.19	81	42.86	χ^2=160.90 Df=28 P<0.0001
	Shortness of breath	80	18.39	00	0.0	34	9.91	33	17.46	
	Loss of taste	229	52.64	00	0.0	86	25.07	35	18.52	
	Loss of smell	274	62.99	00	0.0	113	32.94	47	24.87	
	Throat pain	133	30.57	00	0.0	86	25.07	1	0.53	
	Neck pain	34	7.82	00	0.0	25	7.29	17	8.99	
	Weakness	265	60.92	00	0.0	143	41.69	73	38.62	
	Sneezing	83	19.08	00	0.0	88	25.66	53	28.04	
	Diarrhoea	63	14.48	00	0.0	36	10.50	28	14.81	
	Joint pain	119	27.36	00	0.0	43	12.54	30	15.87	
	Vomiting	45	10.34	00	0.0	14	4.08	11	5.82	
	Headache	164	37.70	00	0.0	132	38.48	62	32.80	

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Variables		Symptomatic Covid-19 n=435 (39.87%)		Asymptomatic Covid-19 n=34 (1.71%)		Query Covid-19 n=343 (17.31%)		Indeterminate n=189 (9.54%)		χ^2 ; Df ; P value
		No.	%	No.	%	No.	%	No.	%	
	Decrease in oxygen level	52	11.95	00	0.0	11	3.21	4	2.12	
	Nausea	45	10.34	00	0.0	27	7.87	11	5.82	
	Cough and cold	97	22.30	00	0.0	59	17.20	45	23.81	
Comor-bidities	High B.P.	102	23.45	6	17.65	39	11.37	32	16.93	χ^2 =38.49 Df=33 P=0.235
	Diabetes	47	10.80	4	11.76	21	6.12	19	10.05	
	COPD	15	3.45	0	0.00	5	1.46	8	4.23	
	Asthma	28	6.44	2	5.88	23	6.71	15	7.94	
	DPLD	1	0.23	0	0.00	1	0.29	0	0.00	
	Cardiac problem	17	3.91	1	2.94	8	2.33	4	2.12	
	G.I. problem	36	8.28	2	5.88	36	10.50	16	8.47	
	Collagen vascular disease	0	0.00	0	0.00	1	0.29	0	0.00	
	Depression	17	3.91	1	2.94	23	6.71	12	6.35	
	Arthritis	15	3.45	1	2.94	14	4.08	4	2.12	
	Overweight/Obese	54	12.41	2	5.88	39	11.37	23	12.17	
	None	218	50.11	21	61.76	183	53.35	99	52.38	

Query Covid group had significantly higher mild symptoms like sneezing (p value=0.008, Adj OR=1.69) and headache (p value= 0.006, Adj OR= 1.65) while severe symptoms like fever (p value<0.0001, Adj OR=0.43), loss of smell (p value=0.011, Adj OR=0.49), joint pain (p value<0.0001, Adj OR=0.44) and decrease in oxygen saturation level (p value =0.039, Adj OR= 0.45) were significantly higher in symptomatic Covid-19 group. Similarly, in indeterminate group sneezing (p value=0.012, Adj OR=1.79) and diarrhea (p value =0.048, Adj OR=1.80) were significantly higher compared to Covid-19 symptomatic group.

Comorbidities like diabetes, chronic obstructive pulmonary disease, high blood pressure, etc were comparable among the different groups (**Table-2**). High blood pressure seems to be the commonest comorbidities among all the groups. Blood pressure was significantly lower (p value=0.023, Adj OR =0.55) in query Covid-19 group as compared to Covid-19 symptomatic group.

Preventions, medications, and treatment seeking behavior: The majority of the participants in all the groups (symptomatic Covid-19, asymptomatic, Covid-19, query Covid-19 and indeterminate) took vitamin C, practiced warm water gargling, steam inhalation and took multivitamin tablets **(Table- 3).**

Table 3: Medicines taken as prevention, medicines taken during symptoms, medicine seeking behavior, hospitalization, oxygen requirement and isolation history of the Covid-19 symptomatic, Covid-19 asymptomatic, query Covid-19 and indeterminate group.

		Symptomatic Covid-19 n=435 (39.87%)		Asymptomatic Covid-19 n=34 (1.71%)		Query Covid-19 n=343 (17.31%)		Indeterminate n=189 (9.54%)		χ^2 ; Df ; P value
		No.	%	No.	%	No.	%	No.	%	
Prevention Taken	N-Acetyl cysteine	50	11.49	3	8.82	21	6.12	19	10.05	χ^2 =93.6 Df =27 P<0.0001
	Doxycycline	155	35.63	12	35.29	36	10.50	46	24.34	
	Ivermectin	151	34.71	13	38.24	39	11.37	49	25.93	
	Vitamin C	284	65.29	23	67.65	205	59.77	128	67.72	
	Gargle	249	57.24	20	58.82	161	46.94	110	58.20	
	Vapour Steam	268	61.61	19	55.88	184	53.64	109	57.67	
	Homeopathy	36	8.28	1	2.94	47	13.70	30	15.87	
	Ayurveda	15	3.45	0	0.00	19	5.54	8	4.23	
	Multivitamin	229	52.64	23	67.65	158	46.06	97	51.32	
	None	76	17.47	5	14.71	54	15.74	23	12.17	
Medication taken during symptoms	Doxycycline	292	67.13	19	55.88	47	13.70	55	29.10	χ^2 =371.2 Df =48 P<0.0001
	NAC	80	18.39	5	14.71	21	6.12	13	6.88	
	Ivermectin	279	64.14	18	52.94	47	13.70	49	25.93	
	Vitamin C	363	83.45	29	85.29	173	50.44	118	62.43	
	Vitamin D	196	45.06	14	41.18	59	17.20	37	19.58	
	Zinc	327	75.17	24	70.59	120	34.99	83	43.92	
	Famotidine	50	11.49	3	8.82	7	2.04	7	3.70	
	Pan 40	172	39.54	11	32.35	58	16.91	35	18.52	
	Paracetamol	276	63.45	14	41.18	136	39.65	77	40.74	
	Azithromycin	110	25.29	12	35.29	64	18.66	37	19.58	
	Multivitamin	209	48.05	14	41.18	108	31.49	64	33.86	
	Favipiravir	50	11.49	2	5.88	5	1.46	2	1.06	
	Tocilizumab	4	0.92	0	0.00	0	0.00	0	0.00	
	Remdesivir	18	4.14	0	0.00	3	0.87	1	0.53	
	Homeopathy	15	3.45	0	0.00	41	11.95	19	10.05	
	Ayurvedic	7	1.61	0	0.00	14	4.08	3	1.59	
	None	14	3.22	3	8.82	82	23.91	35	18.52	
How did they come to know about medicine?	Consulted Doctor	391	89.89	30	88.24	161	46.94	123	65.08	χ^2 =166.0 Df =12 P<0.0001
	From friend/ family members colleague	9	2.07	2	5.88	59	17.20	22	11.64	
	Websites/ social media	4	0.92	0	0	26	7.58	9	4.76	
	Medicine shop over the counter	1	0.23	0	0	10	2.92	3	1.59	
	Self-prescribed medicine	17	3.91	0	0	51	14.87	18	9.52	
Hospitali-sation, oxygen requirement, isolation history	Hospitalization	65	14.94	0	0.00	0	0.00	4	2.11	χ^2 =78.55 Df=3 P<0.0001
	Oxygen requirement	46	10.57	0	0.00	3	0.87	9	4.76	χ^2 =35.88 Df=3 p<0.0001
	Stayed in isolation	418	96.09	31	91.18	154	44.90	118	62.43	χ^2 =265.2 Df=3 p<0.0001

Symptomatic patients being the reference groups used Ivermectin (p<0.0001, Adj odds ratio=0.41) and doxycycline (p<0.0001, Adj odds ratio =0.41) for prevention in a significantly higher frequency compared to Query Covid-19.While 17.47% of the subjects of symptomatic Covid-19 group did not use any preventive measures (p value= 0.001, Adj OR=0.38) compared to query Covid-19 patients (15.74%), the indeterminate group had a tendency of using homeopathy more than symptomatic Covid-19 patients (p=0.032, Adj odds ratio=0.38).

The asymptomatic Covid group used significantly lesser Paracetamol (p=0.022, Adj odds ratio =0.39) than the symptomatic Covid-19 respondents. Again, symptomatic Covid-19 group being the reference, the query-Covid-19 and indeterminate groups used significantly higher homeopathy drugs (p= 0.002, Adj OR=3.09 and p=0.007, Adj OR =2.99 respectively). The drugs like Doxycycline, Ivermectin, Paracetamol, vitamin D, Zinc supplements, favipiravir were mainly used by Covid-19 symptomatic patients.

The question regarding source of seeking treatment showed that 89.9% of symptomatic Covid and 88.2% of the asymptomatic Covid-19 patients consulted doctors for medicines while only 46.9% of query Covid and 65.1% of indeterminate group consulted doctor (table 4). Thus, a doctor-consultation was significantly low (p<0.0001, Adj OR=0.15) in query Covid-19 group. About 17.2% query Covid and 11.6% indeterminate respondents (p=0.002, Adj OR= 5.38) took advice from friends/ family and colleagues for medications and 14.9% and 9.5% took self-prescribed medicines during symptoms which is an alarming situation as there is possibility of medication misuse by the patients **(table-3 & table-4).** Covid medicines are widely displayed in the social media and a huge number of people are taking the medicine without any confirmatory test or without knowing the side effects and future consequences of taking antibiotics and other supplementary drugs.

Table-4: Multinomial logistic regression analysis of each of the questions in Covid-19 symptomatic, Covid-19 asymptomatic, query Covid-19 and indeterminate group. 95%U= 95% upper limit, 95%, L= 95% lower limit of odd ratio.

Multinomial logistic regression					
		P value	**Adjusted Odds ratio**	**95% (L)**	**95% (U)**
Exposure					
Query Covid-19	Market place	0	2.06	0.336	0.701
	Covid-19 patient at home	0.01	0.55	1.151	2.863
	Friends/ known people	0	2.39	0.035	0.642
Intermediate	Not known	0	11.11	0.035	0.23
	Market place	0.003	1.96	0.328	0.794
	Workplace	0	2.02	0.333	0.732
	Friends/known people	0.001	2.07	0.31	0.749
	Not known	0	13.33	0.027	0.203
Symptoms					
Query Covid-19	Fever	0	0.43	1.67	3.215
	Loss of smell	0.011	0.49	1.348	3.118
	Sneezing	0.008	1.69	0.399	0.872
	Joint pain	0	0.44	1.474	3.563
	Headache	0.006	1.65	0.423	0.866
	Decrease in oxygen level	0.039	0.45	1.042	4.733

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Multinomial logistic regression					
		P value	**Adjusted Odds ratio**	**95% (L)**	**95% (U)**
Exposure					
Indeterminate	Fever	0	0.40	1.705	3.751
	Loss of taste	0.044	0.55	1.016	3.296
	Loss of smell	0	0.38	1.54	4.435
	Sneezing	0.012	1.79	0.357	0.88
	Diarrhoea	0.048	1.80	0.311	0.995
	Decrease in oxygen level	0.011	0.24	1.369	12.71
Comorbidities					
Query Covid-19	High blood pressure	0.023	0.55	1.087	3.024
Prevention					
Query Covid-19	Doxycycline	0	0.35	1.716	4.694
	Ivermectin	0	0.41	1.494	3.939
	None	0.001	0.38	1.503	4.493
Indeterminate	Homeopathy	0.032	1.80	0.326	0.952
Medication					
Covid-19 Asymptomatic	Paracetamol	0.022	0.39	1.148	5.7
Query Covid-19	Doxycycline	0	0.25	2.535	6.448
	Ivermectin	0	0.38	1.603	4.217
	Zinc	0.004	0.52	1.228	3.039
	Favipiravir	0.032	0.33	1.099	8.344
	Homeopathy	0.002	3.09	0.157	0.669
Indeterminate	Doxycycline	0.017	0.54	0.115	3.035
	Ivermectin	0.011	0.51	1.164	3.294
	Vitamin D	0.026	0.58	1.068	2.748
	Zinc	0.008	0.51	1.194	3.185
	Favipiravir	21	0.18	1.292	24.03
	Homeopathy	0.007	2.99	0.152	0.738
Treatment seeking behaviour					
Query Covid-19	Consulted doc	0	0.15	3.706	12.51
Indeterminate	Friends/ family/ colleagues	0.002	5.38	0.065	1.243

Compared to the symptomatic group, rate of hospitalization is considerably less in asymptomatic group (χ^2=78.55, p<0.0001). Same trend can be observed in oxygen requirement (χ^2=35.88, p<0.0001). On the other hand, as regards isolation, Covid-19 symptomatic and asymptomatic respondents isolated themselves in substantially higher frequency compared to query Covid and indeterminate group (χ2=265.2, p<0.0001) which is an issue of major concern **(Table 3).**

Reasons of not testing for diagnosis, post Covid-19 complications and mask usage:

The unwillingness to test either with RT- PCR or rapid antigen was inquired. The results revealed that the less severity of symptoms (46.4%) and the perceived necessity of testing being 'unnecessary' (26.3%),were the two most common responses followed by other reasons including unavailability of home collection for tests (11.1%), fear of discrimination (6.7%), delay in getting the test results (6.4%), not finding a test center (4.1%), the high cost of the test (5%), other inconveniences (3.2%), fear of having difficulty to procure essentials at home if the test turns positive (2.6%), and fear that a positive report would hamper job/work (2.3%) **(Fig.- 1)**.

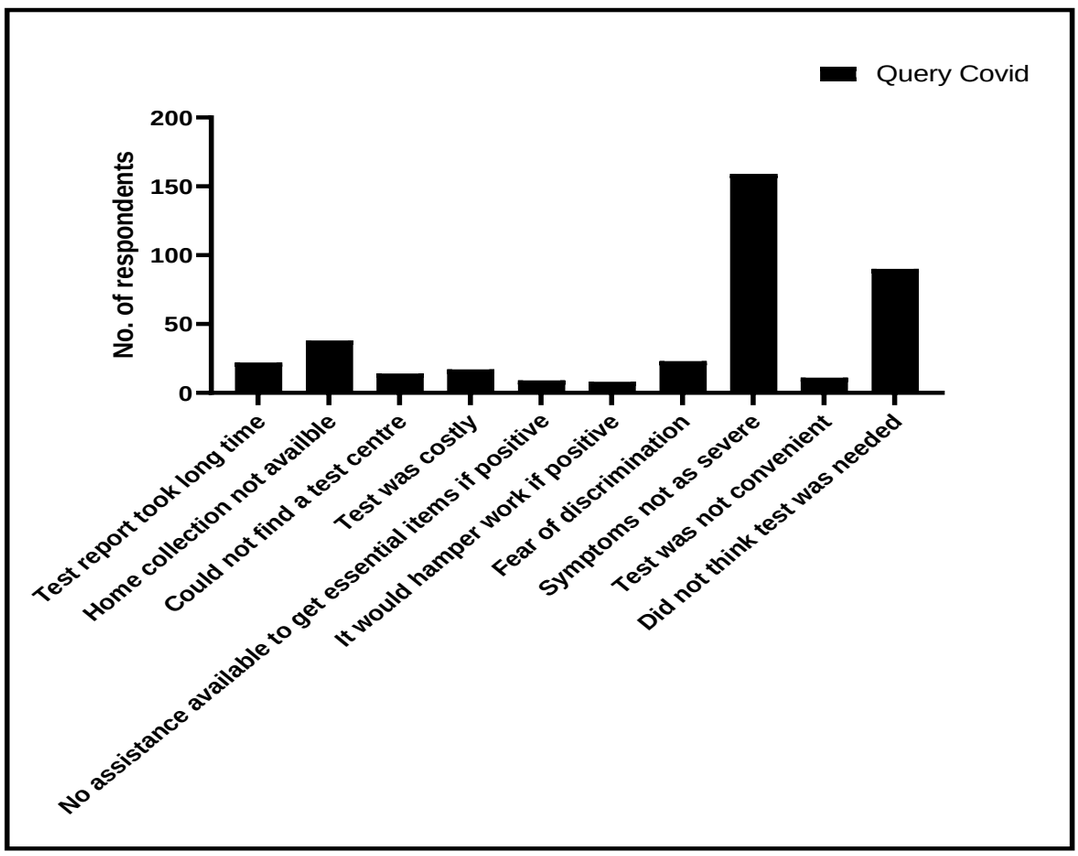

Figure -1: the different reasons why the query Covid-19 groups did not op for testing are reported. Less severity of symptoms and thinking test was not required were the primary reasons of not taking the test.

The symptomatic (41.6%) and asymptomatic patients (14.7%) Covid respondents had higher post Covid complications compared to query Covid-19 (7%) and indeterminate group (8.5%) (χ^2=160.5, p<0.0001). The higher frequency of post Covid-19complications is likely related to the severity of symptomatic patients. Incidentally, the use of surgical mask was more frequent in symptomatic Covid-19 patients (70.8%) compared to others (χ^2=18.83, p=0.0258). Use of different types of masks has been noted in Supplementary figure 2.

Discussion

The impact of Covid-19 pandemic on community is profound and far-reaching. In a pandemic situation, raising awareness towards the disease and testing procedures are of prime importance, but despite having adequate knowledge, awareness, and perception regarding the disease, [18] the applicability of them is lacking in the general masses. Our respondents have male predominance and age group between 18-40 years (50%) (Table 1). The blood group result (Fig. 1) suggests no association of ABO blood group and Covid-19 risk as suggested by other studies. [19] Major modes of transmission in all respondents are marketplace, workplace, direct contact with friends/known people and other public places (Table 2). Thus, we can reasonably conclude that although direct transmission is a significant mode of disease transmission, the public places are the main hub of spreading infection. [20] Symptomatically, fever and breathlessness were more common along with loss of taste, smell, throat discomfort and weakness in symptomatic Covid-19 patients. However, sneezing was more common in query-Covid and the indeterminate group. Hypoxia was obviously more in symptomatic Covid patients. High Blood pressure was the most frequent comorbidity found universally in the respondents followed by diabetes, gastrointestinal problems, asthma, COPD, depression, and others (table 2). This demographic and clinical background suggests that a relatively young, educated population have responded to our questionnaire in higher frequency. This could be because of technological awareness and being more informed than the people from other age groups could. It has been reported in the literature that younger population is more susceptible to asymptomatic or mild Covid-19 infection. [21] The symptomatic profile fits to the published symptoms of Covid-19. Many of our respondent patients had comorbidities despite having skewed representation of relatively young population. Hence, it is likely that relatively elderly and old population mostly having severe disease in first and second wave of Covid-19 might have had much higher frequency of comorbidities.

As regards to effort of prevention, 12-17% of respondents did not take any preventive action. Multivitamin was used most commonly along with Vitamin C, although the published data on vitamins to prevent Covid-19 is lacking. [22-25] Homeopathy medications were used widely by indeterminate and query-Covid-19 patients. Doxycycline and ivermectin were the two most common allopathic medicine consumed by symptomatic and asymptomatic Covid-19 patients. Gargling with warm water seemed to be another popular preventive strategy used by all the group of participants (over 45% in each group), but the effectiveness of warm water gargling with or without add-on formulations are still debatable.[26-29] Our respondents were treated by several modes of therapy including Ayurveda, homeopathy, antiviral drugs like remdesivir and favipiravir, multivitamins, immune stimulants (zinc), and prospective anti-SARS-CoV-2 like doxycycline or ivermectin. [30] There is an overall tendency of using treatment less frequently in asymptomatic Covid, query-Covid, and indeterminate group. From the responses of the above, it is compelling to conclude that the participants were aware of the options available to them. However, it is not possible to remark on the reason of choosing one drug over the other. Use of multivitamin, vitamin C and D in highest frequency could mean rampant suggestions, easy availability, and lack of knowledge regarding the other chemo preventive / therapeutic agents. The use of remdesivir war restricted to symptomatic Covid patients admitted to hospitals while favipiravir was found used by asymptomatic, query Covid and indeterminate group (small in number). Interestingly, although it varies in different groups, majority had consulted doctors except the query-Covid patients who seem to seek advice from family members, colleagues, friends, social media, and practiced self-medication more than any other group. It is possible that query-Covid patients had least symptoms as they had no record of hospitalization or use of oxygen inhalation (Supplementary Fig.-2). This might influence them to adopt self-medication and second-hand advice more frequently. This behavior is also seen less frequently in indeterminate group (Table-3). Perhaps the symptoms and positive RT-PCR results motivated the participants to seek proper medical assistance.

Overall awareness appears to be reasonably acceptable in milieu of the fact that consulting a doctor was difficult during the period of Covid circuits. The practice of isolation was good in our respondents. Symptomatic and asymptomatic Covid patients isolated themselves in more than 90% cases and indeterminate group in more than 60% cases, while it was least (about 40%) in query Covid group (Table-3). Despite the high-density population that remains a major social barrier in maintaining social isolation and distancing, [31] the self-motivated isolation behavior of the majority of our patients commensurate well with the published guidelines for Covid patients. However, 9% of the asymptomatic and 55% of query Covid and 30% of indeterminate group are contributing to spread of the disease for not isolating themselves. This lacuna in Covid appropriate behavior might have negative influence on control of Covid surge.

The behavioral issue was further probed through asking the reasons for not undergoing the test. The respondents, most of the time, did not opted for the test for the symptoms being not severe, or they felt that test was not needed. Other causes of not doing the test are far less frequent but more genuine like non-availability of home collection of samples, cost of the test, and the logistic issues as late availability of the test reports.

As expected, post Covid complication was maximum in the symptomatic Covid group followed by the asymptomatic-Covid and indeterminate participants. The behavior of using mask was also recorded and found that surgical mask was most frequently used followed by N95 mask. A large population (more than 25%) used cloth masks that may not be adequately effective. [32] Indeed, universal use of mask reflects adoption of a very important part of Covid-19 appropriate behavior. Overall, the adoption Covid appropriate behavior appears selective and to some extent determined by self-negligence.

We have tried to make the survey comprehensive and have taken in account different areas of awareness regarding Covid -19 and Covid related behavior of population. This impression does not include an overview of the ground reality and logistic constraints in details. The shortcomings in the response-behavior and reasons forwarded for not observing recommendation, though not present in significant proportion, is unfortunate and may be detrimental in the spread of the disease. One needs to have similar study from different region of the country to compare the relative performance of different geographical area. Availability of support, access to medical care, and their financial status is not known; these might have influenced the responses. Despite the mentioned weaknesses, our observations underscore the importance of the persisting threats of Covid surge in future where prevention and treatment may demand better public awareness and participation.

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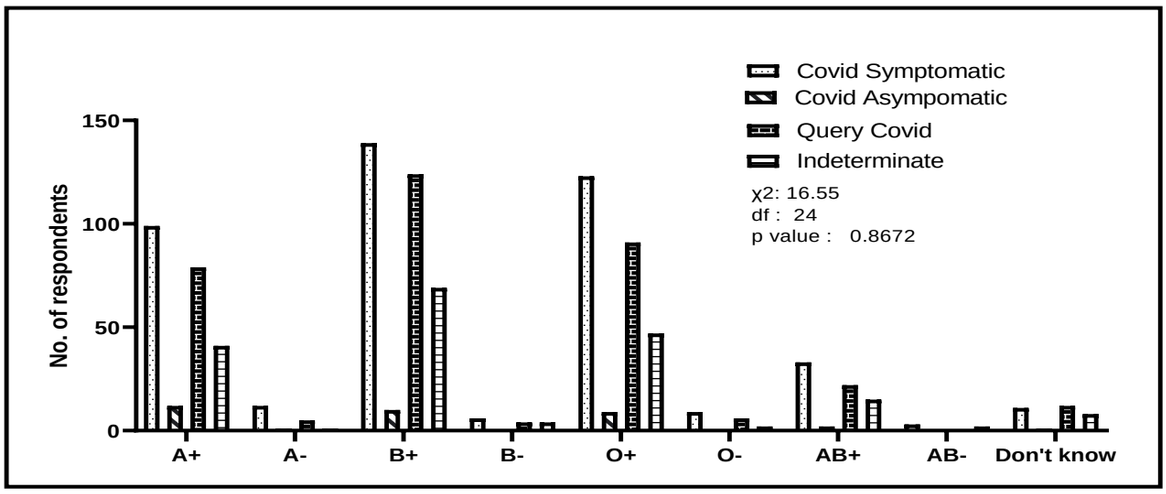
Supplementary:

S1: Blood group difference between theCovid-19 symptomatic, Covid-19 Asymptomatic, query Covid-19 and indeterminate group. B+, O+ and A+ are the most predominant among the different groups.



S2: The post Covid-19/ symptoms complications and mask wearing preferences among Covid-19 symptomatic, Covid-19 asymptomatic, query Covid-19 and indeterminate group.

		Covid-19 Symptomatic		Covid-19 Asymptomatic		Query Covid-19		Indeter-minate		χ2, df and P value
		n=435		n=34		n=343		n=189		
Have complication Post Covid-19		181	41.61	5	14.71	24	7.00	16	8.47	χ2= 160.5 Df=3; P<0.0001
Use of mask	Surgical mask	308	70.80	23	66.67	226	65.89	122	64.55	χ2=18.83 Df= 9 P= 0.0258
	Cloth Mask	117	26.90	0	0	101	29.45	52	27.51	
	N95	269	61.84	32	91.36	243	70.85	123	65.08	
	N99	14	3.22	0	0.00	8	2.33	7	3.70	
	Handkerchief	0	0	0	0.00	0	0.00	0	0.00	
	No mask	0	0	0	0.00	0	0.00	0	0.00	

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