



STRENGTH OF KNOWLEDGE AND PRACTICES TOWARDS COVID-19 AMONG THE POPULATION OF SUPER SPREADERS-A CROSS-SECTIONAL STUDY.

Community Medicine

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ABSTRACT

Background: Superspreaders continue to stir up the COVID-19 incidence at an alarming rate by disproportionately infecting a high number of contacts as compared to a typical infected person contributing to the speed and degree of the outbreak and becoming an epidemiological concern. Therefore the study aims to evaluate knowledge regarding Covid-19 spread and preventive measures adopted against the same among the super spreaders.

Methods: A self-designed questionnaire was prepared and 205 individuals involved in different occupations with possible super spreader roles were interviewed through non probability sampling technique from the field practice area of B.J medical college and adjoining sites during the time span of 4 months. The demographics, knowledge, and practice of the participants were investigated and analysed using MS Excel.

Results: Out of the total participants (n=205), majority of them were males (68.4%) belonging to age group of 30-40 years (41.7%) with primary education (34%). Around 26.2% of them were auto-rickshaw drivers followed by vegetable vendors (17.5%). Knowledge of COVID transmission was limited. Statistically this was significant with their education but it didn't play a role in protective mechanism adopted by them. Gender wise no major difference was seen with respect to knowledge and preventive measures.

Conclusion: Our findings reveals that most participant's knowledge regarding COVID-19 pandemic was found to be limited and preventive measures practised by them were average which may increase the risk of transmission.

KEYWORDS

“covid-19”, “knowledge”, “practice”, “superspreaders”

INTRODUCTION:

It's true that we are currently living in a world hounded by the coronavirus pandemic WHO declared COVID-19 (coronavirus disease-2019) as a “Public health emergency of international concern” on 30th January 2020 and later declared COVID-19 a pandemic on 11th march, 2020. (parimal patel, 2021) COVID- 19 is highly contagious with a certain mortality rate, and it was classified as a class B infectious disease and managed as a class A infectious disease in China in January 2020. Nonetheless, the fatality rate of the current pandemic is on the rise (between 2%-4%), relatively lower than the previous SARS-CoV (2002/2003) and MERS-CoV (2012) outbreaks. (Sonam Maheshwari, 2020)

In India, a confirmed case of COVID-19 was reported on 30th January and on 24 March 2020, the Government of India under Prime Minister Narendra Modi ordered a nationwide lockdown for 21 days, limiting movement of the entire 1.3 billion population of India as a preventive measure against the COVID-19 pandemic in India. Thereafter restrictions were gradually lifted off in the country except for those in containment zones allowing mobility of people. It was termed as 'Unlock' which was planned under 6 phases. (schultz, 2020)

A super spreading event (SSEV) is an event in which an infectious disease is spread much more than usual, while an unusually contagious organism infected with a disease is known as a super spreader. In the context of a human-borne illness, a super spreader is an individual who is more likely to infect others, compared with a typical infected person. Such super spreaders are of particular concern in epidemiology. Superspreaders have been identified as the one who excrete a higher than normal number of pathogens during the time they are infectious. This causes their contacts to be exposed to higher viral/bacterial loads than would be seen in the contacts of non-superspreaders with the same duration of exposure (Kenneth J. Rothman, 2008) They may or may not show any symptoms of the disease. (Stein, 2010)

During the SARS-CoV-1 2002–2004 SARS outbreak from China, epidemiologists defined a super spreader as an individual with at least eight transmissions of the disease. (Zhuang Shen, 2004)

Some cases of super spreading conform to the 80/20 rule (wikipedia, 2020) where approximately 20% of infected individuals are responsible for 80% of transmissions, although super spreading can

still be said to occur when super spreaders account for a higher or lower percentage of transmissions. In epidemics with such super spreader events, the majority of individuals infect relatively few secondary contacts.

The individual reproductive number R_0 represents the number of secondary infections caused by a specific individual during the time that individual is infectious. Some individuals have significantly higher than average individual reproductive numbers and are known as superspreaders. Through contact tracing, epidemiologists have identified superspreaders in measles, tuberculosis, rubella, monkeypox, smallpox, Ebola hemorrhagic fever and SARS. (Gaston De Serres, 2013) (J. O. Lloyd-Smith, 2005)

Curating a total of 60 SSEs in this way, we found 45 SSEs associated with SARS-CoV-2 and 15 SSEs associated with SARS-CoV. (JAMES J COLLINS, 2020)

Keeping in mind the above mentioned facts, it becomes utmost important to implement personal hygiene and public health behaviours like hand washing and maintaining social distancing in order to curb the superspreading and lower the burden of coronavirus. (Shruti Shukla, 2020) To date, there has been limited published data on the knowledge and practices of so called 'superspreader' group.

This study thereby was conducted to highlight the strength of knowledge and level of preventive strategies taken by the group of “superspreaders” against COVID-19 and whether they augment the spread of COVID-19 in the current scenario. This will help us in determining the readiness of the community to accept the 'behavioural change communicative measures from health authorities.

MATERIALS AND METHODS:

A descriptive cross-sectional study was conducted with the help of a self-designed semi structured questionnaire and a total of around 205 individuals involved in different occupational sectors of society with the possible 'super spreader' roles were selected through non probability sampling technique from the field practice area of B.J medical college and adjoining sites. After obtaining verbal consent from these individuals they were interviewed regarding the knowledge and practice of preventive measures against COVID-19 including abiding by the social distancing norms, temperature measurement at

their job site or use of sanitizers etc. The study was carried out over a period of 4 months.

The descriptive analysis focused on frequencies, percentages and statistically significant association.

The socio-demographics, knowledge, and practice of the participants were investigated and analysed using MS Excel 2019 and SPSS version.26

RESULTS:

Out of total 205 individuals who were interviewed, 68.4% were males and 31.1% were females. Majority of them (41.7%) belonged to the age group of 30-40 years while only 3.4% were from 60 above age group. Regarding their educational status, maximum people (34%) were having primary education, 21.4% were having secondary education while 15% of individuals were without any education qualifications as summarized in Table 1.

Among the people who were interviewed, the auto rickshaw drivers comprised a major proportion of 26.2% followed by 17.5% of vegetable vendors and 16% of shopkeepers. 59.2% of people were residing in the urban slums and rest of them in the non-slums area. Out of this 54.8% of their residential area had been a COVID hotspot. 10% of people were having the migration history from the adjoining states. No recent travelling history was obtained from the interviewee as seen in Table 1.

‘Table 1: Sociodemographic Profile Of The Study Participants.’

Sociodemographic profile		Frequency	%
Age of person	20-30 years	43	20.9
	30-40 years	86	41.7
	40-50 years	52	25.2

	50-60 years	17	8.3
	>60 years	7	3.4
Gender	Male	141	31.1
	Female	64	68.4
Education	Graduate	36	17.4
	Higher secondary	24	11.7
	Secondary	44	21.4
	Primary	70	34
	Illiterate	31	15
Housing setup	Urban non-slums	83	40.3
	Urban slums	122	59.2
Area of residence was/is a covid hotspot	Yes	62	33.17
	No	45	21.95
	Maybe	9	4.39
	Don't know	83	40.49
Occupation	Auto-rickshaw driver	54	26.2
	Vegetable vendors	36	17.5
	Fruit seller	16	7.8
	Food stalls	11	5.3
	Mess/restaurant worker	12	5.8
	Pharmacist	22	10.7
	Shopkeeper	33	16
	Beauty parlour/salon workers	21	10.2

92.2% of people were aware of the new corona virus. Among the study group 88.8% and 23.4% of the individuals believed coughing and sneezing and touching any contaminated surfaces to be the possible mode of COVID19 transmission respectively. How so ever 6.3% considered it as food and water borne disease. Most common symptom according to them was fever (94.6%) followed by cough (74.1%), difficulty in breathing (38%) and body ache (16%) as seen in Table 2.

‘Table 2: Knowledge About Covid-19 And Preventive Strategies Adopted For The Same Among The Study Participants.’

Knowledge		Male (n=141) (%)	Female (n=64) (%)	Total, n=205 (%)
K1 -Have you heard of new corona virus(covid-19)	Yes	127 (90.1)	62(96.9)	189(92.2)
	No	4 (2.8)	1(1.5)	5(2.4)
	Maybe	10 (7.1)	1(1.5)	11(5.3)
K2 -How it can be transmitted?	Cough and sneeze	126 (89.4)	56(87.5)	182(88.8)
	Touching any contaminated surface	30 (21.3)	18(28.1)	48(23.4)
	Face to face talking	96 (68.1)	31(48.4)	127(62)
	Handshake/hugs	1 (0.7)	2(3.1)	3(1.5)
	Food and water	10 (7.1)	3(4.6)	13(6.3)
K3 What are symptoms of COVID-19?	Cough	110 (78)	42(65.6)	152(7.1)
	Difficulty in breathing	54(38.3)	24(37.5)	78(7.1)
	Fever	131(92.9)	63(98.4)	194(7.1)
	Headache/body ache	27(19.1)	14(21.8)	41(7.1)
	Loss of taste/smell	20(14.2)	9(14)	29(7.1)
	Running nose	17(12.1)	15(23.5)	32(15.6)
	Diarrhoea/vomiting	1(0.7)	1(1.5)	2(0.97)
K4 - What preventive facilities provided by government are you aware of?	24X7 helpline no.	45 (31.9)	17(26.5)	62(30.2)
	Free rapid antigen testing camps	88(62.4)	48(75)	136(66.3)
	Aarogya setu app	87(61.7)	44(68.7)	131(63.9)
	Contact tracing protocol/sanjeevani van	15(10.6)	5(7.81)	20(9.8)
	Not aware of any	6 (4.3)	6(9.3)	12(5.9)
K5 -Are you aware of COVID-19 vaccine	Yes	103(73)	44(68.7)	147(71.7)
	No	38(26.9)	20(31.2)	58(28.2)
Preventive measures				
P1 - Do you wear masks?	Yes	118(83.7)	57(89)	175(85.4)
	No	23(16.3)	7(10.9)	30(14.6)
P2 -If yes, what type of mask do you wear?	Cloth mask	72(61)	44(77.1)	116(66.3)
	Surgical	41(34.7)	16(28)	57(32.6)
	N95 mask	16(13.6)	1(1.7)	17(9.7)
	Others	3(2.5)	3(5.2)	6(3.4)
P3 - How frequent do you practise handwashing/use hand sanitizer?	After sneezing, coughing	6(4.3)	8(12.5)	14(6.8)
	On touching any contaminated surface	21(14.9)	16(25)	37(18)
	After returning to home from work	13(9.2)	9(14)	22(10.7)
	At least every hour	12(8.5)	5(7.8)	17(8.3)
	After shaking hands with others	3(2.1)	2(3.1)	5(2.4)
	Everytime when a customer visits	38(27)	13(20.3)	51(28.8)
	Anytime during day	30(21.3)	11(17.1)	41(23.2)
	Do not practise	24(17)	4(6.25)	28(13.7)

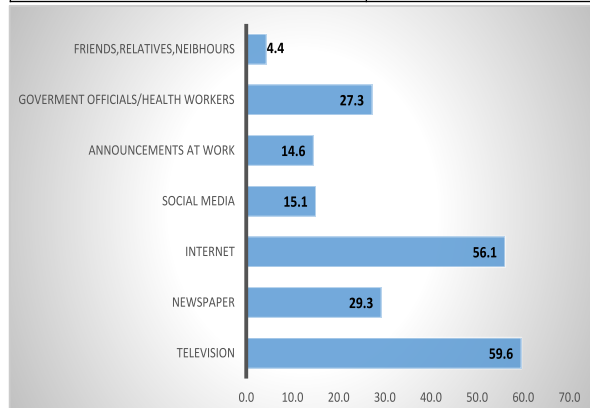
P4- Have you taken any medicine for prevention against COVID-19	Yes	96(68.1)	33(51.5)	129(62.9)
	No	45(31.9)	31(48.4)	76(37.1)
P5- If yes, then specify the type?	Allopathic medicine	13(9.2)	1(1.56)	14(6.8)
	Ayurveda medicine	11(7.8)	7(10.9)	18(8.8)
	Homeopathic medicine	16(11.3)	3(4.69)	19(9.3)
	Homemade remedy/ <i>kadha</i>	56(39.7)	22(34.3)	78(38)
P6- If you have any symptoms suspecting of COVID-19, then what will you do?	Contact health care worker	10(7.1)	5(7.8)	15(7.3)
	Stay at home and use stored medicines	25(17.7)	9(14)	34(16.5)
	Visit private clinic	56(39.7)	13(20.3)	69(33.6)
	Visit public hospital	50(35.5)	37(57.8)	87(42.4)

Regarding the preventive measures, 98.5% used face masks wherein most of them used cloth mask and 27.8% and 8.3% people used surgical and N95 masks respectively. There was a statistically significant difference in their knowledge about preventive measures against covid-19 based on their education levels ($p\text{ value} < 0.0001, df = 16, X^2 = 111.7$). Those with higher educational showed 100% use of face masks and 95% use of hand sanitizer as compared to those with lower educational status. There was a gender based difference in the use of different types of masks which was statistically

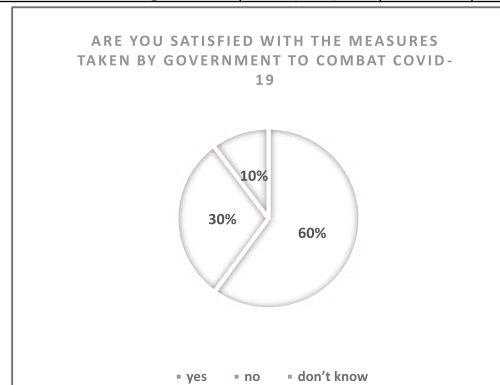
significant ($p\text{ value} = 0.0031, df = 3, X^2 = 13.8$). Out of total, 69.3% of participants used hand sanitizer and 55.1% performed hand washing. How so ever no significant difference in the frequency of hand washing/use of hand sanitizer was found when compared with their gender or literacy status. About 26% of females practised hand washing following return to home from work and after sneezing or coughing against 13.5% of males who followed the same trend. Only 3.9% of participants followed the social distancing norms (Table 2).

“Table 3: Preventive strategies adopted by participants belonging to different occupational groups”

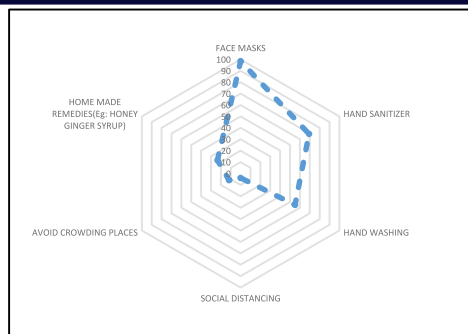
WHAT DO YOU DO TO AVOID CROWDING/CONTAMINATION IN YOUR PLACE	METHODS	FREQUENCY (%)	Do Not Maintain (%)	TOTAL
AUTO RICKSHAW DRIVER	allow 1 or 2 persons at a time in rikshaw	6(11.1)	48(88.8)	54
BEAUTY PARLOUR/SALON	Appointment based customers only	7(33.3)	5(23.8)	21
	ask customers to maintain social distancing	3(14.2)		
	Plastic Shield	6(28.5)		
FOOD STALL	ask customers to maintain social distancing	1(9.09)	5(45.4)	11
	ask people to maintain distance and bring their own carry bags	1(9.09)		
	avoid putting stalls at crowded place	1(9.09)		
	Plastic Shield	1(9.09)		
	wear mask,use sanitizer	2(18.1)		
FRUIT SELLER	ask people to maintain distance and bring their own carry bags	2(12)	7(43.7)	16
	avoid putting stalls at crowded place	7(43.7)		
MESS/RESTAURANT WORKER	Appointment based customers only	1(8.33)	6(50)	12
	Plastic Shield	3(25)		
	wear mask,use sanitizer	2(16.6)		
PHARMACIST	allow only single person to enter shop	4(18.8)	4(18.1)	22
	allow people to come in queue	1(4.55)		
	ask customers to maintain social distancing	3(13.6)		
	use of barricades to maintain social distancing	10(45.4)		
SHOPKEEPER	allow people to come in queue	1(3.03)	7(21.2)	33
	allowed 2 person at a time inside the shop	7(21.2)		
	ask customers to maintain social distancing	1(3.03)		
	ask people to stand out if place is Crowded	1(3.03)		
	Cloth Shield, Circles for customers	2(6.06)		
	don't allow to people to try products sample	1(3.03)		
	Plastic Shield	1(3.03)		
	use of barricades to maintain social distancing	12(36.3)		
	ask customers to maintain social distancing	2(5.56)		
VEGETABLE VENDORS	ask people to maintain distance and bring their own carry bags	2(5.56)	26(72.2)	36
	avoid putting stalls at crowded place	4(11.1)		
	use of barricades to maintain social distancing	2(5.56)		
	ask customers to maintain social distancing	2(5.56)		



“GRAPH 1: Sources of information about COVID-19 as utilised by the study participant”



“GRAPH 2: percentage of satisfaction level shown by the study participants towards the preventive actions taken by government against COVID-19”



“GRAPH 3: Collaborative preventive strategies followed by the superspreaders”

Table 3 shows that 11.1% of auto rickshaw drivers allowed only one or two persons at a time in their rickshaw; 13.64% of pharmacist and 14.29% of saloons staff asked their customers to maintain social distancing; 36.6% of shopkeepers made use of barricades to avoid crowding and maintain social distancing; 28.57% of staff at saloons used plastic shields for precaution and around 12% of fruit sellers 5.5% of vegetable vendors asked their customers to bring their own carry bags.

Around 42.4% of individuals preferred visiting public hospital over private (33.6%) in case if they develop any covid symptoms. As shown in table 2, 16.5% people choose staying at home and wait to get better rather than visiting any healthcare setting. Majority of the people being interviewed (66.3%) were aware about the free rapid antigen testing camps and 63.9% about the arogya Setu camp. Out of all, 6% of the interviewee were unaware about any of the covid related government facilities. There was significant difference in their awareness about the Covid-19 related government facilities and their literacy status (p value < 0.00001 , $df = 16$, $X^2 = 147.7$). Nearly 71.7% people have some information about Covid-19 vaccine.

There was also significant difference in use of various medicines for prophylaxis against COVID 19 according to their gender (p value $= 0.0209$, $df = 1$, $X^2 = 5.33$). Table 2 shows 69% males had taken various non prescribed medicines for covid-19 prevention. However no gender based difference was seen in the type of medicines preferred. Majority of people (38%) favoured homemade remedies.

Among the study participants, the major source of their information related to COVID-19 was obtained from television (59.6%) followed by internet sources (56.1%) as depicted in 'Graph 1'. Of all the individuals, 60% were satisfied about the measures taken by the government to combat covid 19 as seen in 'Graph 2'. 'Graph 3' summarizes the various preventive measures adopted by the study groups.

DISCUSSION:

In the present study, the knowledge, attitude, and practice towards COVID-19 in the group of people regarded as 'superspreaders' were assessed.

Majority of people in our study were aware that COVID-19 spreads through coughing and sneezing (88.8%) while only 23.4% were aware that the disease also spreads through direct contact with contaminated materials/infected persons which is a common mode in our country while a recent study conducted on the residents of Maharashtra showed that 94.7% of people knew that it spreads through direct contact and were unaware of the other modes of transmission. (Shruti Shukla, 2020) Most of the participants had good knowledge about the common symptoms of COVID-19 which was consistent with findings reported by other authors. (Tomar BS, 2020) (Shruti Shukla, 2020) In this study 98.5% of participants regarded face masks as an effective means to prevent COVID-19 spread followed by use of hand sanitizer (69%) and hand washing (55%). This practice is primarily due to strict measures taken by the government to prevent the overwhelmed wave of new infection and secondly due to awareness and acceptance people. Only 23.4% people preferred homemade remedies like drinking honey ginger syrup/kadha or eating citrus fruits. How so ever another study showed that one third people agreed that eating citrus fruits or gargling salt water can prevent infection. (Tomar BS, 2020) According to WHO gargling warm or saltwater and consuming citrus

fruits will not kill novel-corona virus (WHO, Infection Prevention and Control of Epidemic- and Pandemic-Prone Acute Respiratory Infections in Health Care, 2014)

A statistical significant difference was observed between the participants' education status and their knowledge regarding the various COVID-19 facilities offered by the government. Also the type of preventive measures adopted by the participants was being influenced by their ease at occupation. A similar finding was also reported in another study where factors like education level and occupation act as strong indicator of knowledge domain regarding COVID-19 which postulates the combination of better access to information and high education level leads to appropriate apprehension and comprehension of information on covid-19, consequent to better knowledge on COVID-19. (Tomar BS, 2020)

Here 11.7% of participants avoided going to crowded places and it mostly consisted of those with higher education levels. But a study conducted in Tanzania showed 97.6% of people avoided going to crowded areas. (Sima R, 2020)

In our study around 60% of interviewee showed positive attitude towards the measures taken by government to combat the spread of COVID-19 including the strict lockdown imposition while in another study it was reported that 81% participants were convinced of the government preventive steps against COVID-19. (Shruti Shukla, 2020) This figure is quite low in studies conducted in other countries' (Sima R, 2020) (Al-Hanawi MK, 2020)

Majority of participants used television as their main source of information related to COVID-19 (59.6%) followed by internet services (56%), Newspaper (29.3%) and government officials/health workers (27.3%).

The findings of the study cannot be generalized as it does not take into account the rural population.

CONCLUSIONS:

To conclude, majority of the participants involved in activities/occupation with higher attributes for 'superspreader' risk, have demonstrated acceptable level of knowledge, positive attitude and satisfying level of preventive measures adopted against COVID-19 pandemic. But still there is scope for improving the existing knowledge and practices towards COVID-19 through strengthening the health promotion activities especially among the group of people with potential 'superspreader' risk. Emphasis must be given to the consistency of information from government and related authorities. (Shruti Shukla, 2020).

DECLARATION:

Funding: NIL

Conflict of Interest: NIL

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