Existing Knowledge on COVID-19 Pandemic and Hygienic Practice Among South Indians

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Abstract

Introduction: Corona Viruses primarily cause enzootic infections in birds and mammals but, in the last few decades, it is being capable of infecting humans as well. World Health Origination announces newly emerging Corona virus disease 2019 (COVID-19) outbreak is a pandemic and major threats in mortality and economic crisis.

Objectives: To study existing knowledge, hygienic practice, their traditional food habits and cultural activity on the novel COVID-19 is every much essential among the general population to reduce further spread of disease and assimilate the impact for better standards of living.

Methods: A validated and pre-tested questionnaire on knowledge of pandemic COVID-19, hygienic practice, traditional food habitats and cultural activities were assessed in 800 participants from both Urban and Rural area which includes aged 18 and above years of both male and female, having school and graduate education.

Results : This cross sectional study showed that average knowledge on COVID-19 was 68% (Mode of Transmission 94%; Affecting organ 79%; Morphology of Virus 33% and Symptoms 65%), 78% showed good Hygienic practice in which only 62% were using handkerchief while coughing and sneezing. An average of 77% consumed traditional foods (using banana leaves 58%; Rasam 80%; food ingredients like Turmeric, Ginger and Garlic 94%, lighting lamp and benzoin resin smoke 88%).

Conclusion: As till date there is no effective prophylaxis for COVID-19, which leads to the spread in an exponential way across the globe, but still in India tropical climate, existing knowledge on mode of the transmission of virus, good hygienics practices among the public as well as sensitized by the Government will combat the spread and death due to COVID-19 virus irrespective of dense population.

Key words: *Corona virus; Pandemic; COVID-19, Hygienic Practice, Knowledge*

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Introduction

Evolutionary factors that affect a pathogen's ability to infect a novel host. The emergence of human diseases from animal virus by switching hosts from animal to humans and was subsequently transmitted within human populations result in outbreak, mortality and economic

burden. Newly emerging viral diseases are major threats to global public health. The 75% of emerging human infectious diseases are of zoonotic, such that transmitted from animals to humans [1]. World Health Origination(WHO) announces COVID-19 outbreak a pandemic COVID-2019- "CO" stands for "corona", "VI" for "virus" and "D" for "disease" 2019 – year of outbreak. Corona virus are enveloped single-stranded (SS), positive-sense RNA viruses named after crown-like surface projections seen under electron microscopy. Covid-19 spread fairly through air by coughing and sneezing from infected person through droplet nuclei results in the respiratory tract infection.

Symptoms include fever, tiredness, and dry cough, shortness of breath, breathing difficulties, persistent pain or pressure in the chest and in more severe cases may leads to pneumonia, severe acute respiratory syndrome, kidney failure and even death[2]. Spreading of infection can be prevented by regular hand washing, covering mouth and nose when coughing and sneezing, thoroughly cooking meat and eggs, avoid close contact with anyone showing symptoms of respiratory illness.

Droplet nuclei transmission is possible for most of the respiratory infections and if microbes are also an airborne pathogen has a potentially huge impact on health status. A large fraction of the world's illness and death is attributable to poor hygienic, lack of knowledge and awareness on communicable diseases, poor nutritional diets and low immunity. The present study was designed to explore the existing knowledge and hygienic practices related to COVID-19 pandemic, traditional food and cultural actives which states immune status among South Indian Population.

Methodology

The study was carried out during February 2020 in South India (Tamilnadu and Pondicherry which includes 4 Urban (Pondicherry, Chennai, Trichy and Thanjavur) and 4 Rural areas (Villianur, Mannadipet, Thuraiyur and Aranthangi) respectively. Institutional Ethics Committee (IEC/2020/008a) approval was obtained from Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry, India. Over all 800 participants which includes both male and female volunteers, aged in years between 18 to 40 and 41 and above, participated in this study after getting due consent. For data collection, a closed-ended questionnaire were used and all the data were kept confidentially. Exclusion criteria was those who are not willing to participated and aged less than 17 years in this study. The questionnaire measured includes the sociodemographic data (Name, Age, Gender, Educational Level and habitat), knowledge on COVID-19 (Mode of transmission, Affecting organs, Morphology of Virus, Symptoms of COVID-19); Hygienic practice (Hand wash and using Face cover during coughing and sneezing) and traditional food and culture activities. The possible responses regarding knowledge on COVID-19, each YES answer was given '1' Score and NO was given '0'

A pilot study [tested with a group of 50 people both Male(n 32) and Female(n 18)] was done to ensure applicability of the questionnaire and to estimate the time frame needed to complete it. The questionnaire (both in Tamil and English language) was validated by three experts in the microbiology, internal medicine, and biostatistics fields.

Statistical Analysis

Data were expressed in percentage data were categorized as urban and rural papulation, male and female, aging 18 to 40 and 41 and above, school and graduate for the analysis. For comparisons across the group, Chi-square test was used, for all comparisons $P < 0.05$ was considered statistically significant.

Result

In this study included 800 study participants, after approaching the consenting process and were completed the questionnaire. Overall results showed (Table no.1) that knowledge of COVID 19 was 68%, Hygienic practice 77%, consuming traditional food 77% and traditional activity 75%.

In the present study results (Table no. 2) of urban population (n 400, 50%) had good knowledge on COVID-19 mode of transmission (*n* 400, 100%) affected organs (*n* 400, 100%), Morphology of Virus (*n* 256, 64%), and symptoms of COVID-19 (*n* 362, 90.5%) significantly higher than rural population (n 400, 50%) knowledge in transmission (*n* 368, 92%) affected organs (*n* 232, 58%), Morphology of Virus (*n* 0, 0%), and symptoms of COVID-19 (*n* 182, 45.5%).

On Gender wise Knowledge in the study results (Table no. 2) showed male (n 492, 61.5%)were sound knowledge on COVID-19 mode of transmission (*n 484,98.4* %) affected organs (n 426,86.6 %), Morphology of Virus (*n 134, 27.2*%), and symptoms of COVID-19 (*n* 321, 65.2%) significantly more knowledge than female (n 308, 38.5%)regarding mode of transmission (*n 284, 92.2* %) affected organs (*n* 206, 66.9 %), Morphology of Virus (*n 122, 39.6* %), and symptoms of COVID-19 (*n* 223, 72.4 %).

Further, aged (Table no. 2) between 18 to 40 years (n 453, 56.6%) person's knowledge were showed good knowledge of COVID-19 in mode of transmission (*n 401, 100* %) affected organs (n 401, 100%) and symptoms of COVID-19 (*n* 317, 79.1%) significantly more knowledge than above 41 years old person (n 347, 43.4 %) in mode of transmission (*n 367, 92* %) affected organs (*n 231, 57.9* %), and symptoms of COVID-19 (*n* 227, 56.9 %), but knowledge in Morphology of Virus, aged 18 to 40 years (*n 183, 45.6* %) of person knows less than aged above 41years (*n 73, 18.3* %),

Among population (Table no. 2) who studied up to school (*n 578, 72.3%)* education had significantly good knowledge in mode of transmission (*n 549, 95* %) affected organs (n 413, 71.5 %), and symptoms of COVID-19 (*n* 336, 58.1%) than who completed graduation (*n 222, 27.7* %) mode of transmission (*n 219, 98.6* %) affected organs (n 219, 98.6 %), and symptoms of COVID-19 (*n* 208, 93.7 %). In contrast know of Morphology of Virus (*n130, 58.6* %), in graduate is greater than school completed population Morphology of Virus (*n 126, 21.8* %),

The data of hygienic practice of COVID 19 showed in Table No.3. Hand wash practices and using f ace cover showed significantly higher in urban (*n* 390, 97.5% & *n* 347, 86.8 %), male (*n 469, 95.3* % & *n* 264, 53.7 %), aged between 18 to 40 years (*n* 386, 96.3 % & *n* 259, 64.6 %) and school (*n* 530, 91.7 % & *n* 305, 52.8 %) educated person than the rural (*n* 362, 90.5 % & *n* 149, 37.3 %), female (*n* 283, 91.9 % & *n* 232, 75.3 %), aged above 41years (*n* 366, 91.7 % & *n* 237, 59.4 %)and graduates(*n* 222, 100 % & *n 191, 86* %) respectively.

Table. No.1. Average Existing Knowledge On Covid-19 Pandemic; Hygienic Practice, Traditional Food and Culture AcitivityAmong South Indians

Knowledge on COVID-19	Overall %	Hygienic Practice	Overall %	Traditional Food	Overall %	Traditional activities	Overall %
Mode of Transmission	94	Hand wash with soap or sanitizer	93	Taken food in Banana leaf	58	Using oil lamp	88
Affected organ	79	Using Face cover or Hand kerchief while sneezing & Coughing	61	Food with Rasam	80	Benzoin resin smoke	62
Morphology of Virus	33			Turmeric, Ginger & Garlic as ingredients in regular foods	94		
Symptoms of COVID-19	65						
Average	68	Average	77	Average	77	Average	75

Table. No. 2. Percentage of Existing Knowledge of Covid-19 Pandemic Among the Urban and Rural, Male and Female, Below and Above 40 years of age, Graduate and School completed South Indians

Characteristics	Total, n (%)	Mode of Transmission, n (%)		P	Affected Organs, n (%)		P	Morphology of Virus, n (%)		P	Symptoms of COVID-19, n (%)		P
		YES	NO		YES	NO		YES	NO		YES	NO	
Population													
Urban	400 (50)	400 (100)	0(0)	0.000	400 (100)	0(0)	0.000	256 (64)	144(36)	0.000	362(90.5)	38(9.5)	0.000
Rural	400(50)	368 (92)	32(8)		232(58)	168(42)		0(0)	400 (100)		182(45.5)	218(54.5)	
Gender													
Male	492(61.5)	484(98.4)	8(1.6)	0.000	426(86.6)	66(13.4)	0.000	134(27.2)	358(72.8)	0.000	321(65.2)	171(34.8)	0.035
Female	308(38.5)	284(92.2)	24(7.8)		206(66.9)	102(33.1)		122(39.6)	186(60.4)		223(72.4)	85 (27.6)	
Age group (yrars)													
18 to 40	453(56.6)	401(100)	0(0)	0.000	401(100)	0(0)	0.000	183(45.6)	218(54.4)	0.000	317(79.1)	84(20.9)	0.000
41 and above	347(43.4)	367(92)	32(8)		231(57.9)	168(42.1)		73(18.3)	326(81.7)		227(56.9)	172 (43.1)	
Education													
School	578 (72.3)	549(95)	29(5)	0.018	413(71.5)	165(28.5)	0.000	126(21.8)	452(78.2)	0.000	336(58.1)	242(41.9)	0.000
Graduates	222(27.38)	219(98.6)	3(1.4)		219(98.6)	3(1.4)		130(58.6)	92(41.4)		208(93.7)	14(6.3)	

Table. No. 3. Percentage of Hygienic Practices Among the Urban and Rural, Male and Female, Below and Above 40 years of age, Graduate and School completed South Indians

Characteristics	Hand Wash, n (%)		P value	Using face cover, n (%)		P value
	YES	NO		YES	NO	
Population						
Urban	390(97.5)	10(2.5)	0.000	347(86.8)	53(13.3)	0.000
Rural	362(90.5)	38(9.5)		149(37.3)	251(62.7)	
Gender						
Male	469(95.3)	23(4.7)	0.05	264(53.7)	228(46.3)	0.000
Female	283(91.9)	25(8.1)		232(75.3)	76(24.7)	
Age group (yrars)						
18 to 40	386(96.3)	15(3.7)	0.007	259(64.6)	142(35.4)	0.13
41 and above	366(91.7)	33(8.3)		237(59.4)	162(40.6)	
Education						
School	530(91.7)	48(8.3)	0.000	305(52.8)	273(47.2)	0.000
Graduates	222(100)	0(0)		191(86)	31(14)	

Discussion

Virus is an Acellular, obligate intracellular parasite contains either DNA or RNA nucleic acid bounded in a protein coat called capsid. DNA virus replicate in nucleus while RNA virus replicate in the cytoplasm. The capsid with nucleic acid is known as nucleocapsid, some of the viruses have an extra covering, which is the membranous envelope covering the capsid called enveloped virus[3]. Single stranded RNA viruses are classified as negative-sense or positive-sense, or ambisense. The positive-sense viral RNA genome can serve as messenger RNA and can be translated into protein immediately in the host cell by which function both as a genome as well as messenger RNA and can directly cause infection[4].

Emerging new viral diseases are often shift from its original host into a novel species must adapt to successfully infect a novel host like use of different cell surface receptors, to escape the host immune response and successfully replicate and transmitted to the new host. RNA viruses are the most likely group of pathogens to jump between hosts, possibly because of their ability to rapidly adapt to new hosts. RNA viruses have a broad host range being particularly prone to jumping between distantly related species. Lack of proofreading ability in RNA polymerases of RNA virus leads to mutations remain in the newly synthesized RNA is one of the major sources of diversity that allows viral evolution to take place at an unprecedented scale of viral antigenic drift were vaccine are ineffective. Further mediates cell-cell fusion between infected cells and adjacent, uninfected cells. This leads to the formation of giant, multinucleated cells, which allows the virus to spread within an infected organism without being detected or neutralized by virus-specific antibodies [5]

Mostly Virus gains the ability to spread efficiently within a new host that was not previously exposed or susceptible. This may be achieved by either increased exposure or the gaining of variations that allow them to overcome barriers to infection of the new hosts, in these cases, outbreaks will be the result since that have the ability to spread efficiently between individuals in populations of the new host. Transferring successfully over great phylogenetic distances might be the reason for the novel SS positive sense RNA COVID-19 shift to human form unknown host believed to be the result of Zoonotic transmission. Following a host shift favours mutations that allow utilising better cellular machinery, enhancing immune avoidance, replication, optimising virulence, and maximising the transmission potential might be the reason for pandemic outbreak. Overall globally 1,099, 960 cases were confirmed with COVID-19 infection in which 59,197 cases from India and death rises to of which 68 from India as on 4th April 2020 [6]. The percentage of death was greater in male gender (2.8%) than female (1.7%) this may be due to respiratory complications because of smoking. Further physically more active by male by which circulatory system cannot keep up with the available oxygen by the muscles. In order to maintain the energy level, muscles shift from aerobic to anaerobic metabolism by which break down of carbohydrates anaerobically to generate energy result in pyruvate metabolic products in the absence of oxygen converted into lactic acid. These modifications of the energy level utilization by the viral infected cells can increase available energy for viral replication [7].

Most of the enveloped viruses are animal virus origin derived from portions of the infected host cell membranes with some viral glycoproteins which protect from the host immune system on the other hand enveloped viruses are easily destroyed by agents affecting lipids such as alcohols and high temperature [8]. By which the enveloped COVID-19 are more susceptible to drying and easily destroyed during high temperature. WHO announces novel COVID-19 outbreak a pandemic as it spread in an exponential way but still in India the positive cases was only under limited numbers irrespective of dense population. This may be one of the reasons India's hot tropical climate which is average temperature of 35-45° C in current season.

The key to reducing loss of life, personal injuries, and damage during outbreak of infectious disease is widespread of public awareness and education. Public should need to be aware, in advance, of procedures to follow in a crisis that threatens to paralyze the entire community they serve, and they need to know how to communicate accurate information to combat against the outbreak. In this present study shows higher knowledge and hygienic practice among groups urban, male, aged between 18 to 40 and school education group than the rural, female, aged above 41 years and graduates. In

addition to that south Indian populations are following traditional food habit and also have traditional activity habits regularly.

In the present study knowledge on COVID-19 (Table no. 1)was assessed in which 94% of people aware that mode of transmission through droplet nuclei generated from infected persons and 79% aware which affect the respiratory tract. Regarding morphology of COVID-19 only 33% aware it's an enveloped RNA virus, and 65% of the studied population had knowledge on symptom of COVID-19 infection.

Though urban population showed higher percentage of knowledge on CONVID 19 then rural population but still it is believed that less dense population in rural area may reduce the spread of COVID 19 virus. (Table No.2) Poor hygiene practices and inadequate sanitary conditions result in wide spread of communicable diseases. In the present study awareness of hand washing was assessed in which 93% of people are washing hands with soap before taking food and only 61% of people were using Handkerchief while coughing and sneezing warrant further sensitize (Table no.3). South India Greeting culture is by clasp vertically hands in front of the chest without any physical contacts and strictly restricted the footwear's away from the living area also plays an important role in control the transmission of contagious infection.

Many foreigners were wondered that South Indians have great respect for the therapeutic value of food as followed in Siddha and Ayurvedic principles in their everyday eating like served food on a banana leaf, daily intake of Pepper, Tamarid and turmeric powder added as an ingredients in most of the recipe in the South Indian dishes like Pongal, Rasam and Sambar recipes (Table no.1) which showed antiviral property by inhibiting the viral replication [9-11]. The present study showed 77% of the studied population used traditional food. As eating healthy foods not only regulate the immune system but also protect against infection. Further Ginger and garlic added in most of the South Indian recipes also reported to have antiviral property by increase the body temperature [12]. An increase in body temperature has been known since ancient times to be associated with infection and inflammation. Elevated body temperature stimulate more number of CD8 or cytotoxic T-cell" which capable of destroying the intracellular parasite [13]. In the present study 86% of studied population had ancient style of traditional food (Table No. 1). Traditionally 88% of population use to light oil lamp and 62% of population use Benzoin resin smoke after Sun set which will act as an air purifier, remove moisture content and act as organic disinfectants that drive away insects and many pathogenic microbes of airborne [14].

India is a developing country were most of the Government hospitals are well ventilated and more number of open market (Sandhai) are available around the country. Well-designed natural ventilation systems can often be more effective than air conditioning in promoting effective infection control, by increasing the number of air exchanges [15]. Poorly ventilated buildings affect air quality have higher risks of infectious disease transmission for patients, workers, and visitors might be the reason for high number of COVID-19 positive cases observed in most of the developed countries.

Conclusion

Till date there is no effective line of prophylaxis for COVID 19 at least existing holistic approach in antiviral herbal drugs administered along with modern medicine to prevention intense spread of this virus. In addition overall the Indian climatic condition, good knowledge, traditional culture and food habit may reduce / slow down the spread of pandemic COVID-19 in India by which health care systems has sufficient time to prepare and assimilate the impact for better and healthy standards of living.

Funding: None

Competing Interests: None declared:

Ethical approval: IEC No. : IEC/2020/008a

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