

The Level of Awareness on Preventive Measures during Pandemic Outbreak with a Special Reference to COVID – 19 – A Study in Coimbatore District, Tamil Nadu

Dr. M. Sriram¹, Dr. M. R. Vanithamani²,
Assistant Professor¹, Professor and Director²,
Department of Management Studies^{1,2},
Karpagam College of Engineering^{1,2},
Coimbatore 641 032, Tamil Nadu^{1,2}

Email: sriram89.m@gmail.com¹; drvanithaselvakumar@gmail.com²

Article Info
Volume 83
Page Number: 2070 - 2078
Publication Issue:
May - June 2020

Article History
Article Received: 11 August 2019
Revised: 18 November 2019
Accepted: 23 January 2020
Publication: 10 May 2020

Abstract:

This study investigated the awareness level on preventive measures during COVID – 19 pandemic outbreak in Coimbatore district, Tamil Nadu. Using convenient sampling, data were collected from 166 respondents through e-questionnaire. Descriptive statistics revealed that 78.3% respondents have received information on outbreak through news in the television. Only 50% respondents said that they wash their hands for 20 seconds and only 37.3% respondents said that they will maintain distance of 3 feet. Maximum respondents (92.8%) said that it was not safe to frequently touch eyes, nose and mouth and 81.9% said that they have habit to wash hands and foot when coming from outside to their houses. About 66.3% respondents said that they use soap, water and alcohol-based rubs to wash their hands during outbreak and 70.3% respondents were aware that they use their elbow or tissue during cough and sneeze. 75.9% respondents said that they would report to nearby health care authority if they feel fever, cough and respiratory issue. It was suggested that the people should properly understand the preventive measures instructed by the government and avoid relying on social media.

Keywords: Awareness level; COVID – 19; preventive measures; pandemic; outbreak

I. Introduction and literature review

Pandemic and epidemic outbreaks are not newest to any nation. Such outbreaks happened several times in various countries and people had overcome with lot of struggles and governments have taken lots of measures to overcome such situations.

Pandemic is defined by the World Health Organization as “the worldwide spread of a new disease”.

Some of the deadly pandemic and epidemic diseases as per the World Health Organization (WHO), Centre for Disease Control and Prevention (CDCP), National Centre for Biotechnology Information (NCBI) and other authentic internet sources were tabulated from recent to old given below:

Table 1
List of Severe Epidemic and Pandemic Diseases

Name of the disease	Outbreak year and place	Infected initially from
Novel Corona virus	2019, Wuhan	Pangolins and bats
Swine flu	2009, Mexico	Pigs
SARS	2003, China	Bats
Nibah virus	1998, Malaysia	Bats and pigs
Hendra virus	1994, Bristane	Horses
Meningitis	1990s, Sub-Urban Africa	Bacteria, fungi
Ebola virus	1976, Central Africa	Wild animals
Tularaemia	1970s, USA	Rodents
Lassa fever	1969, Nigeria	Rats
Marburg virus	Germany and Serbia, 1967	African Green monkeys
Hong Kong flu	1968, Hong Kong	Birds
Monkeypox	1958, Congo	Animals
Asian flu	1957, China	Birds

Chikungunya	1952, Tanzania	Mosquitos
Zika virus disease	1947, Uganda	Mosquitos
Crimean-Congo haemorrhagic fever	1944, Cremia and 1956, Congo	Ticks
Rift valley fever	1931, Kenya	Mosquitos and blood feeding flies
Spanish flu	1918, Spain	Birds and mammalians
Polio	1841, Louisiana	Contaminated food or water
Yellow Fever	Late 19 th century, Western Africa	Mosquitos
Dengue	1779, Asia, Africa and North America	Mosquitos
Plague	14 th Century, Europe	Small mammals and fleas
Cholera	Unknown	Contaminated food or water
Smallpox	Unknown	Unknown

This study is not related to clinical research. It is about a general awareness among people when they face a situation like pandemic. This study was conducted to test the awareness level during the period of COVID-19-outbreak in Coimbatore district, Tamil Nadu, India.

As per the Table 1, it is evident that there were many pandemics and epidemics occurred in the world and through such experiences, institutions like World Health Organization (WHO) has been developing several strategies to safeguard the living beings from infection, fever and fatalities.

Especially, people who do not directly involve into to the process of overcoming the pandemic needs awareness on how to protect themselves from not getting affected. For this reason, the concern government instructs people on how to act during outbreaks.

The literature related to awareness on pandemic worldwide are reviewed hereunder:

A study was conducted by Swaddiwudhipong et al. (1992) on awareness to prevent dengue spread in Thailand. It was found that more people in the study area were aware that such disease is spread from water kept open in jar and water retention areas. So, by properly closing

water retained objects, the disease might be controlled.

Similarly, Phuanukoonnon et al. (2015) discussed on how Northeast Thailand people practiced control measures to control dengue. They found that closing all the containers and water retain object may control dengue larvae for a short-term however for effective control, frequent cleaning of objects is required.

A study was conducted by Acharya et al. (2005) on the level of awareness and preventive measures to be taken during dengue outbreak in south Delhi. It was found that television was found as an important information source to spread awareness among vast sections of people.

Balkhy et al. (2010) conducted a study on awareness and knowledge on swine flu among Saudi public. It was found that due to low level of knowledge among public, the level of awareness was less. Authors said that lack of education is another big drawback for not understanding the severity of the disease.

A similar study was conducted in Saudi Arabia by Almutairi et al. (2015) to know about the awareness of MERS-CoV, a type of corona virus. It was found that people were highly aware about the preventive measures to be taken during pandemic outbreak.

Liao et al. (2010) researched on awareness of pandemic H1N1 virus among people in Hong Kong. A hypothetical model was designed to follow preventive measures during outbreak. It was found that people have trusted the government in following the hygiene instructions like hand washing, and self-distancing. They also had trust in the formal information provided by the government and self-efficacy.

A research was undergone by Shilpa et al. (2014) to test the awareness on swine flu in urban Karnataka. It was found that nearly two-third of the respondents have heard about the flu and more than half of the respondents said that they received information through mass media. Hand washing and wearing of face mask were found as major preventive measure among people. They also knew that fever was one of the symptoms of flu.

To test people's awareness on preventive measures by taking into account of previous

outbreaks, a study was carried out by Lin et al. (2017) in USA. The study was conducted to know the prior knowledge about SARS and H1N1 to take preventive measures on MERS. It was found that people have knowledge about previous pandemic outbreaks and new threat called MERS.

Rathi et al. (2011) tested the awareness and knowledge level about H1N1 flu in Vadodara urban.

It is found that more than two-third of respondents had knowledge about how the pandemic is spread from one organism to another and also about the preventive measures. But the knowledge level was lesser when the mode of spread was enquired. People have understood that consulting doctor during a suspect and handwashing were important to-dos during outbreak.

Through conducting survey, the actual awareness among people could be identified. When Johnson and Hariharan (2017) studied the awareness on H1N1 influenza among public in Trinidad and Tobago in 2016, it was found that people have assumed that H1N1 is not a serious illness and preventive measures. So, it was suggested that the information on health should be disseminated by the government to make them realize the seriousness of pandemic.

The social media has a very greater role in spreading the information on pandemic to people because 49 percent of global population are users of social media. A study was carried out by Sharma et al. (2017) on Zika virus spread in America and how the social media had helped to disseminate the preventive measures to the public. They took Facebook for the study and found that irrelevant and fake information were wide spread that important health related information from the government.

Because of several outbreaks in western nations, they had strategic plans to face the situations during pandemic. Patriarca and Cox (1997) studied about the plan of preparedness to pandemic by America. It was found that they focused on surveillance system, communication system, detection of disease system, emergency facilities, liability actions towards medical manufacturers and vaccination to public.

The attitude towards swine flu pandemic among people in Sydney were researched by Seale (2009). It was found that nearly 40 percent of the people do not have information on preventive measures. The respondents suggested that instead of hand wash hygiene, the quarantine and vaccination would be more effective to control pandemic. The authors suggested that people should be more informed about measures to be carried on during outbreak.

A study was conducted by Funk et al. (2010) on people's behavior during epidemic and how do they look on the infected people. The authors said that people who are aware of the disease can easily stop spreading the same. And also said that the behavior of people changes when the infection spread is high and they start realizing the awareness of prevention. It was suggested that spreading rumors should be reduced during pathogen spread to avoid conflicts and panic.

Not only common public should be aware of pandemic, even the paramedical should also be aware so that they can help the respective government to render timely service. A study was conducted by Thabit (2011) among paramedical in Baghdad and found that people in paramedical is well aware of terminologies about diseases, the spread of virus and prevention possibilities.

Hilton and Smith (2010) has studied on how public responded to the action of government and media during H1N1 outbreak in UK in 2009. It was found that due to over-reporting by the media, people started thinking that the spread is unavoidable hence reduced to follow hand hygiene and social distancing. It is suggested that media should reduce over-projection about the disease and communicate on overcoming the disease.

Many researches said that the pandemic shows more severity among children and old age people. Chaudhary et al. (2010) conducted a study to test the awareness level of swine flu among school children in Bareilly. It was found that nearly 98 percent of the students are aware of such disease and they also mentioned that wearing of mask would be a good measure for prevention. However, they were less aware of medicines available in the market and they found that television was the major information source.

Tooher et al. (2013) conducted a systematic review on the level of knowledge, behaviour and attitudes on 2009 H1N1 outbreak. Through review, it was found that there was high level of awareness on pandemic and moderate awareness level on knowledge about the same. The study found low level of awareness on concern about risk, consideration on precautionary measures, and intention to know about the same. It was further found that old age people and female had more knowledge on pandemic.

The knowledge among students is considered very crucial during pandemic because they can educate their well-beings. Akan et al. (2010) researched a university in Istanbul about awareness of H1N1 outbreak and preventive measures. The researchers found that the perception of risk is higher among females than males. They found that mass media provided more information when compared to other sources. However, majority of the students said that they are not interested in vaccination.

Marshall et al. (2009) researched about the awareness and preparedness on pandemic among people in Australia. It was found that about half of the respondents said that they have not heard about H1N1 pandemic and only 10 percent is concerned about the flu threat in the study area. The level of knowledge and awareness in the study area on H1N1 pandemic was found so poor however they said that television was the important source to gain information, and when vaccination is needed, children should be considered first and politicians and teachers were considered least.

Communication is vital during pandemic outbreak to know the happenings of the same. A study was undergone by Lin et al. (2014) to know the inequalities in communication during H1N1 pandemic. Though government impose strategies on communication during pandemic outbreak, due to difference in ethnicity, education and income, the flow of information is left to inequality. If communication is effective, there would be more chance to trust the government officials, increase in level of knowledge, belief in the source of information, and adoption of preventive measures.

Al-garadi et al. (2016) tracked social networks online to know how the pandemic has

happened. A literature was surveyed in the internet on various publishing sites and found that the information received through online can be used for live surveillance system. The system could capture real time data to identify the pandemic.

Dental students were studied by Priya and Chauhan (2018) to know the level of awareness on H1N1 in Malaysia. The result said that the students responded the disease as moderately dangerous and most common symptoms were understood as fever, cough and illness. They also said that washing hands is more appropriate preventive measure during pandemic and avoidance of travel is the best way to stop further spreading of the virus.

Like dental students, Gambhir et al. (2016) has carried out a research among dental professionals on awareness of H1N1 and preventive measures during outbreak. It was found that majority of the respondents knew about the flu and nearly half of the respondents have gone through the study reports of such flu affected subjects. The awareness of vaccine for the flu is more and hand cleaning hygiene and use of sanitizers were found more effective to protect from the virus spread.

Kini et al. (2017) has undergone a study in Karnataka on the awareness and myths about swine flu among people. From the analysis they found that the level of awareness is very less among people. Around 67 percent are only aware about the flu, and only 35 percent knew about preventive measures. However, tele-media was the major informational source about the pandemic.

Jun and Lee (2018) researched on how school teachers perceive about the awareness and spread the same during pandemic including MERS outbreak. From their point of view, they segregated the measures into two, one is regular countermeasures and another one is countermeasures during the situation like pandemic outbreak. Such information was available to all the members of the institution. To avoid misinformation and confusion, all the report of the teachers is compiled into one report and to the concerned government authority.

As the users of social media has drastically increased, Chan et al. (2020) researched on how such media is helpful to spread the awareness and information with respect to COVID – 19. The

authors said that during the SARS pandemic, due to lack of knowledge and information, the life of the health care providers became highly risky. So, by using social media and spreading information in a right pace will reach the people at the right time and benefit the society.

Zareen and Prasad (2018) have researched the awareness on H1N1 flu in rural Telungana. It was found that most of the respondents are aware of the flu. They said that television was the major source to disseminate the information and the least source of around 10 percent is from the healthcare professionals. It is suggested that the health care representatives should provide valid information to the people which will educate them to act on prevention during outbreak.

Parekh et al. (2019) conducted a study in Udaipur city with respect to awareness, prevention, attitudes, and treatments on swine flu among people. The information about the disease was mostly gathered from the newspapers and television by the people. Some of the respondents still do not believe how the pandemic is caused and how the flu is spread. Very less people are aware that hand hygiene would stop the virus from spreading further.

Li et al. (2020) researched on awareness influence on epidemic, which are spread through random networks. The study considered two types of awareness viz. local and global. The information on awareness received from the outbreaks of other regions would reduce the spread in the local. The researchers found that breaking of infectious edges would have more effect than reducing the rate of infection.

Takahashi et al. (2017) researched on awareness and preventive measures followed by Japanese people during H1N1 outbreak. The researchers mainly focused on avoidance of infection due to flu, using mask for protection and insistence for regular and rapid diagnosis. These factors were related to attention on health care like avoidance of touching the face and using hand sanitizers.

Nayyef et al. (2017) studied the awareness of public related to cholera in Baghdad. They studied about awareness on transmission of disease, prevention and control of the same. It was found

that people are aware about the disease in general but they lack awareness in specific such as transmission of disease and how to prevent the spread of such pandemic. The researchers suggested that the people of the study area should be educated by the concern government to make them aware and preparedness to pandemic.

From the above reviews it is found that majority of the studies were conducted outside India and the awareness study on COVID – 19 is very limited and there is no such study conducted in Coimbatore district of Tamil Nadu, India.

II. Objectives of the Study

The objective of this study is to test the awareness level on preventive measures during COVID – 19 among people in Coimbatore district.

III. Research methodology

This study has used descriptive statistics to know the characteristics of various factors of the respondents pertaining to awareness on preventive measures of COVID – 19.

Convenience sampling was used to collect the data and e-questionnaire using Google Forms was used as instrument to collect data. The questionnaire was sent to 220 potential respondents and within the given time, the response received was 186. Out of that, by removing incomplete questionnaires, the final sample came to 166.

IV. Results and discussion

The result of this study was segregated into two viz. demographic status and awareness level on protection of COVID – 19, which are discussed below:

A. Demographic Status of the Respondents

The questions with respect to demographic status consist of five factors that are found relevant to the study (Refer Table 2).

Table 2 Demographic Status

Demographic Status		f	%
Gender	Male	102	61.4
	Female	64	38.6
Age	18-25	103	62.0
	26-33	28	16.9
	34-41	18	10.8

	42-49	4	2.5
	50 and above	13	7.8
Qualification Status (Latest)	Uneducated	14	8.4
	Schooling	10	6.0
	Diploma	8	4.8
	Undergraduate (Except Engineering and Medicine)	44	26.5
	Postgraduate (Except Engineering and Medicine)	78	47.1
	Professionally Qualified (Engineering, Medicine, Chartered Accounting, Law)	12	7.2
	Occupation Status	Salaried	36
Self-Employed or Doing Business		22	13.3
Job-Seeker		4	2.4
Pursuing Education (Student)		78	47.0
Home Maker		20	12.0
Pensioner		6	3.6
Number of Members in your Family including yourself	Two	16	9.6
	Three to Five	125	75.3
	More than Five	25	15.1
Total of each factor		166	100.0

From the Table 2, it is found that 61.4% of the respondents are male and remaining are female. The maximum respondents fallen under the age group of 18 to 25 (62%), 47% respondents are post graduate except engineering and medicine. More respondents were students (47%) and nearly 75.3% of the respondents have family members between three and five.

B. Awareness level on prevention of COVID - 19

By referring information provided by the World Health Organization and Department of Telecommunications, Government of India, the questions on awareness level on preventive measures of COVID – 19 were framed. The response to such questions were illustrated in Table 3 below:

Table 3 Awareness level on prevention of COVID - 19

Awareness on prevention of COVID - 19		f	%
How did you get the information about the Outbreak of COVID 19?	By watching news in television	130	78.3
	Through WhatsApp or Facebook	12	7.2
	Through neighbours or	24	14.5

	family members or friends		
How much time minimum you should spend when you wash your hands?	5 seconds	23	13.9
	10 seconds	38	22.9
	20 seconds	83	50.0
	1 minute	22	13.3
how much minimum distance is required between each person with respect to social distancing?	1/2 feet	14	8.4
	1 feet	37	22.3
	2 feet	53	31.9
	3 feet	62	37.3
Normally, is it good to touch your eyes, nose and mouth frequently?	Yes	12	7.2
	No	154	92.8
Whenever you come from outside to your home, do you have habit of washing your hands and foot?	Yes	136	81.9
	No	30	18.1
During pandemic outbreak, how do you wash your hands?	Just with water	20	12.0
	Using soap and water and alcohol-based hand rub	110	66.3
	Using non-alcoholic hand rubs	24	14.5
	I do not wash my hands frequently	12	7.2
When you cough or sneeze, how do you cover your nose and mouth?	Cover my nose and mouth with both the hands	49	29.5
	Cover my nose and mouth using elbow or tissue	117	70.5
During an outbreak, if you suspect a fever, cough and difficulty in breathing, what will you do?	Take homemade remedies	22	13.3
	Eat a tablet for fever	18	10.8
	Report to the nearby health care authority	126	75.9
About updates on COVID - 19, which source do you believe?	TV news, newspapers and World Health Organization	122	73.5
	WhatsApp forward messages	20	12.0
	Facebook and other social media posts	10	6.0
	Information from neighbours and friends	14	8.5
What do you do when you are asked to the follow lock down?	Work from home and/ or stay isolated	144	86.7
	Visit friends, relatives or neighbours house	22	13.3
Total of each factor		166	100.0

- i. From the Table 3, it was found that 78.3% respondents have received information on outbreak through news in the television, however 7.2% got the information through

- social media and remaining 14.5% from neighbours or friends or family members.
- ii. Only 50% respondents said that they wash their hands for 20 seconds and nearly 35% said that they wash their hands between 5 and 10 seconds.
 - iii. About social distancing, only 37.3% respondents said that they will maintain distance of 3 feet.
 - iv. Maximum respondents (92.8%) said that it is not safe to frequently touch eyes, nose and mouth and 81.9% said that they have habit to wash hands and foot when coming from outside to their houses.
 - v. About 66.3% respondents said that they use soap, water and alcohol-based rubs to wash their hands during outbreak.
 - vi. About 70.3% respondents are aware that they use their elbow or tissue during cough and sneeze.
 - vii. 75.9% respondents said that they would report to nearby health care authority if they feel fever, cough and respiratory issue.
 - viii. 73.5% respondents believe updates on COVID – 19 from TV news, newspapers and WHO.
 - ix. About 86.7% respondents said that they would stay at home or work from home during pandemic outbreak.

V. Conclusion

COVID – 19 pandemic outbreak is becoming one of the historical disasters the people has been experiencing. The measures to be following doing any pandemic outbreak is similar which his evident from existing literature. However, people are not completely aware on preventive measures in the study area. Though government is insisting the public to follow the measures, the hesitance and misinformation from social media distract people from following the same. It is the duty of the people to go through authentic information sources than third-party information to avoid any mislead.

VI. Scope for further research

This study is conducted only in Coimbatore district and descriptive statistics is only used. The possibilities for further research are more such as

extension of the study to other districts and states and application of inferential statistics.

References

- [1] Swaddiwudhipong, W., Lerdlukanavong, P., Khumklam, P., Koonchote, S., Nguntra, P., & Chaovakiratipong, C. (1992). A survey of knowledge, attitude and practice of the prevention of dengue hemorrhagic fever in an urban community of Thailand. *Shock*, 5, 1-2.
- [2] Phuanukoonnon, S., Mueller, I., & Bryan, J. H. (2005). Effectiveness of dengue control practices in household water containers in Northeast Thailand. *Tropical Medicine & International Health*, 10(8), 755-763.
- [3] Acharya, A., Goswami, K., Srinath, S., & Goswami, A. (2005). Awareness about dengue syndrome and related preventive practices amongst residents of an urban resettlement colony of south Delhi. *Journal of vector borne diseases*, 42(3), 122.
- [4] Balkhy, H. H., Abolfotouh, M. A., Al-Hathloul, R. H., & Al-Jumah, M. A. (2010). Awareness, attitudes, and practices related to the swine influenza pandemic among the Saudi public. *BMC infectious diseases*, 10(1), 42.
- [5] Almutairi, K. M., Al Helih, E. M., Moussa, M., Boshaiqah, A. E., Saleh Alajilan, A., Vinluan, J. M., & Almutairi, A. (2015). Awareness, attitudes, and practices related to coronavirus pandemic among public in Saudi Arabia. *Family & community health*, 38(4), 332-340.
- [6] Liao, Q., Cowling, B., Lam, W. T., Ng, M. W., & Fielding, R. (2010). Situational awareness and health protective responses to pandemic influenza A (H1N1) in Hong Kong: a cross-sectional study. *PLoS One*, 5(10), 1-10.
- [7] Shilpa, K., Kumar, B. P., Kumar, S. Y., Ugargol, A. R., Naik, V. A., & Mallapur, M. D. (2014). A study on awareness regarding swine flu (influenza A H1N1) pandemic in an urban community of Karnataka. *Medical Journal of Dr. DY Patil University*, 7(6), 732.
- [8] Lin, L., McCloud, R. F., Bigman, C. A., & Viswanath, K. (2017). Tuning in and catching on? Examining the relationship between pandemic communication and awareness and knowledge of MERS in the USA. *Journal of Public Health*, 39(2), 282-289.
- [9] Rathi, S., Gandhi, H., & Francis, M. (2011). Knowledge and awareness about H1N1 flu in

- urban adult population of Vadodara, India. *Electron Physician*, 3, 392-95.
- [10] Johnson, E. J., & Hariharan, S. (2017). Public health awareness: knowledge, attitude and behaviour of the general public on health risks during the H1N1 influenza pandemic. *Journal of Public Health*, 25(3), 333-337.
- [11] Sharma, M., Yadav, K., Yadav, N., & Ferdinand, K. C. (2017). Zika virus pandemic—analysis of Facebook as a social media health information platform. *American journal of infection control*, 45(3), 301-302.
- [12] Patriarca, P. A., & Cox, N. J. (1997). Influenza pandemic preparedness plan for the United States. *Journal of Infectious Diseases*, 176(Supplement_1), S4-S7.
- [13] Seale, H., McLaws, M. L., Heywood, A. E., Ward, K. F., Lowbridge, C. P., Van, D., ... & MacIntyre, C. R. (2009). The community's attitude towards swine flu and pandemic influenza. *Medical Journal of Australia*, 191(5), 267-269.
- [14] Funk, S., Gilad, E., & Jansen, V. A. A. (2010). Endemic disease, awareness, and local behavioural response. *Journal of theoretical biology*, 264(2), 501-509.
- [15] Thabit, M. F. (2011). Knowledge and awareness towards Swine Flu pandemic among a sample of paramedicals serving in primary health care centers in Baghdad. *Al-Qadisiyah Medical Journal*, 7(11), 85-94.
- [16] Hilton, S., & Smith, E. (2010). Public views of the UK media and government reaction to the 2009 swine flu pandemic. *BMC Public Health*, 10(1), 697.
- [17] Chaudhary, V., Singh, R. K., Agrawal, V. K., Agarwal, A., Kumar, R., & Sharma, M. (2010). Awareness, perception and myths towards swine flu in school children of Bareilly, Uttar Pradesh. *Indian journal of public health*, 54(3), 161.
- [18] Toohar, R., Collins, J. E., Street, J. M., Braunack-Mayer, A., & Marshall, H. (2013). Community knowledge, behaviours and attitudes about the 2009 H1N1 Influenza pandemic: a systematic review. *Influenza and other respiratory viruses*, 7(6), 1316-1327.
- [19] Akan, H., Gurol, Y., Izbirak, G., Ozdath, S., Yilmaz, G., Vitrinel, A., & Hayran, O. (2010). Knowledge and attitudes of university students toward pandemic influenza: a cross-sectional study from Turkey. *BMC Public health*, 10(1), 413.
- [20] Marshall, H., Ryan, P., Robertson, D., Street, J., & Watson, M. (2009). Pandemic influenza and community preparedness. *American Journal of Public Health*, 99(S2), S365-S371.
- [21] Lin, L., Savoia, E., Agboola, F., & Viswanath, K. (2014). What have we learned about communication inequalities during the H1N1 pandemic: a systematic review of the literature. *BMC Public Health*, 14(1), 484.
- [22] Al-garadi, M. A., Khan, M. S., Varathan, K. D., Mujtaba, G., & Al-Kabsi, A. M. (2016). Using online social networks to track a pandemic: A systematic review. *Journal of biomedical informatics*, 62, 1-11.
- [23] Priya, H., & Chauhan, A. (2018). Awareness of the Pandemic H1N1 Influenza Outbreak Among Malaysian Dental Students. *Journal of Pierre Fauchard Academy (India Section)*, 32(3-4), 57-62.
- [24] Gambhir, R. S., Pannu, P. R., Nanda, T., Arora, G., & Kaur, A. (2016). Knowledge and awareness regarding swine-influenza A (H1N1) virus infection among dental professionals in India-A systematic review. *Journal of clinical and diagnostic research: JCDR*, 10(9), ZE10.
- [25] Kini, S., Badiger, S., & UdayaKiran, N. (2017). A Study on Awareness, Attitude and Myths Regarding Swine Flu Pandemic in Rural Communities of Coastal Karnataka: A Cross-Sectional Study. *Nitte University Journal of Health Science*, 7(1), 40-44.
- [26] Jun, E., & Lee, G. (2018). Elementary, middle, and high school health teachers' countermeasures against an outbreak of pandemic diseases, including MERS. *Journal of Korean Academy of Community Health Nursing*, 29, 65-75.
- [27] Chan, A. K. M., Nickson, C. P., Rudolph, J. W., & Joynt, A. L. G. (2020). Social media for rapid knowledge dissemination: early experience from the COVID-19 pandemic. *Pan American Health Organization*.
- [28] Zareen, U., & Prasad, M. (2018). Awareness of Swine Flu (Influenza H1N1) among the rural population of Shamirpet Mandal, Telangana. *Indian Journal of Public Health Research & Development*, 9(10), 80-84.
- [29] Parekh, P. A., Shrivastav, C., & Kumar, G. I. (2019). Knowledge, Attitude and Practice for Prevention and Treatment of Swine Flu in Population of Udaipur City. *International Journal of Physiology*, 7(3), 41-44.

- [30] Li, M., Wang, M., Xue, S., & Ma, J. (2020). The influence of awareness on epidemic spreading on random networks. *Journal of theoretical biology*, 486, 110090.
- [31] Takahashi, S., Sato, K., Kusaka, Y., & Hagihara, A. (2017). Public preventive awareness and preventive behaviors during a major influenza epidemic in Fukui, Japan. *Journal of infection and public health*, 10(5), 637-643.
- [32] Nayyef, H. J., Al-Obaidi, M. J., Jabbar, F., Hannon, A. Y., Waleed, S., Taqi, I. A., & Jasem, I. A. (2017). Public awareness of cholera in Baghdad: A demographic study of educated Iraqi citizens. *Current Research in Microbiology and Biotechnology*, 5(5), 1206-1211.