



Ayurvedic Perspectives to Control and Prevention of COVID-19 Pandemic: A Case Study of Kathmandu District, Nepal

Sadhana Parajuli^{1*}, Prakash Gyawali² and Narbikram Thapa³

¹Teaching Assistant, Ayurveda Campus and Hospital, Kirtipur, TU, Nepal

²Energy Expert, Alternative Energy Promotion Centre, Kathmandu, Nepal

³Professor, Lumbini International Academy of Science and Technology, Lalitpur, Nepal

***Corresponding Author:** Sadhana Parajuli, Teaching Assistant, Ayurveda Campus, Teaching Hospital, Kirtipur, TU, Nepal.

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Abstract

The aim of the research is to assess the effects of Covid-19 pandemic in public health and socio-economic impact in Kathmandu District, Nepal. The study describes the SAR-CoV-2, disease, impact, prevention and mitigation approach and social impact in the community. The study has been conducted based on the primary data related to the public perception towards COVID-19, prevention and management practices survey was performed through the set of questionnaires. In Nepal 59573 covid-19 active cases has been confirmed where 383 death has been verified. In Kathmandu District 11911 Covid-19 active cases has been found and 67 deaths has been verified despite great efforts, there is no treatment of this disease. However, prevention and management are the best options. Ayurveda therapy has been useful for the prevention of infection as well as best for the immune system booster in the management of COVID-19. Also, there is an urgent requirement to awareness rising among new generation for science and technology to fight against any such disaster in future; if any. There is no need to be panic and proper prevention and management are essential to combat this disease.

Keywords: Ayurveda; Prevention; COVID-19 Pandemic; Management and Social Impact; SARS-COV-2

Introduction

Background

Corona virus belongs to the *Coronaviridae* family and appears just like spiked rings when observed through an electronic microscope. The surface looks with various spikes, which are helpful to attack and bind living cells. These are the viruses causing the simple common cold disease to severe illnesses like Middle East Respiratory Syndrome (MERS-CoV), Severe Acute Respiratory Syndrome (SARS-CoV). The source of these viruses is some animals including bats. The word corona virus is a derivative of the Latin corona, which means crown or halo, that states to the typical look indicative of a crown or a solar corona around the virions. These viruses are having a positive-sense single-stranded RNA genome (27 to 34

kilobases) and helical symmetry nucleocapsid [1]. Typically, the corona viruses are of ~20 nm size draped with a large petal or club-shaped surface appearance. The first corona virus was discovered in 1937 in the birds and later on in the 1960s in humans [2]. The various types of viruses, capable to infect human beings are 229E, OC43, HCoV-NL63, SARS-CoV, MERS-CoV, HKU1 and SARS-CoV-2. There are several outbreaks from time to time due to these viruses. The most notorious outbreaks were in 2003, 2012, 2015 and 2018 with 774, 400, 36 and 42 deaths, respectively. It is important to mention that the 2019–2020 outbreaks is started in Wuhan, Hubei Province, China in December 2019, when a new strain of corona virus was detected on 31st December 2019 [3]. World Health Organization (WHO) has given name to this virus as 2019-nCoV (Novel Corona virus 2019, 2020) which was later renamed as Severe Acute

Respiratory Syndrome Corona virus 2 (SARS- CoV-2) by the International Committee on Taxonomy of Viruses. The diseases caused by this virus is called as corona virus disease 2019 and abbreviated as COVID-19 [CO: corona, VI: virus, D: disease and 19: 2019 year]. This virus was found to have 86.9% resemblance to a bat corona virus, and, hence, is suspected to develop from bats [4-6].

This virus is out broken in pneumonia type of disease with respiratory problems, leading to death due to respiratory failure. About 210 countries and territories have been reported to be infected with major outbreaks in the USA, China, South Korea, Italy, Iran, Japan, etc. tolling about 14,043,176 patients with more than 597,583 deaths cases reported globally as of 26 July 2020 [3]. The United States of America is the most affected country with the highest patients of about 0.7 million and about 35,000 deaths. This article is dedicated to the recent outbreak of 2019–2020 describing the diseases, symptoms, spread, prevention, and treatment. This article may be useful to control the present outbreak and future spread. The status of COVID-19 pandemic in Nepal has been presented below (Table 1).

Particulars	Number of People	Remarks
Quarantined	9540	
Isolated	16241	
Active	16241	
Recovered	42949	
Deaths	383	
Total Swab Tested	882915	
Confirmed Cases	59573	

Table 1: Nepal Covid-19 Dashboard.

Source: <https://covid19.ndrrma.gov.np/> accessed on 17/09/2020.

Objectives of the Study

The aim of the research is to assess the effects of Covid-19 in public health and socio-economic impact in Kathmandu District, Nepal.

The following objectives have been set:

- To assess the impact of Covid-19 in public health focusing to Kathmandu District, Nepal; and
- To analyze the negative impacts of COVID-19 in public health and socio-economic aspects at the local community.

Methodology

As per study required, the research area was selected within the Kathmandu district as it includes Kathmandu and Kirtipur citizens both indigenous and migrant community. The participatory approaches and methodology was adopted during the study using basket of tools that include semi-structured interview, key informants interview, participants’ observation, score ranking, happiness mapping, etc. Mainly, the study has been based on primary information related to the public opinion about COVID-19, prevention and management practices survey was carried out through the set of questionnaires. The questionnaire covered both quantitative data and qualitative data for effective study and secondary source of data from existing literature and published books and articles. Simple analytical tool the descriptive statistic like frequency distribution, per cent and the like was used for the analysis of information.

Results and Discussion

Disease and symptoms

Corona viruses infect the upper gastrointestinal and respiratory tract of the mammals (including humans) and the birds. These viruses cause many diseases in animals and human beings but we are limited in this article with SARS-CoV-2, leading to COVID-19 disease. The whole clinical picture of COVID-19 is not completely known. The occurrence of the illness ranged from mild to severe. SARS-CoV-2 propagates through RNA replication using RNA-dependent RNA polymerases enzyme. This virus can mutate slowly, posing a challenge for its treatment and control. The symptoms of COVID-19 may arise within 2 to 14 days after the infection. Besides, in some cases, the diseases prevail after 27 days. However, Chinese researchers mentioned 5.2 days as an average incubation period [7]. The duration of the survival of death is 6 to 41 days after infection of the corona virus. It depends on the age, health and clinical conditions of the patients [5]. The common signs of infection are fatigue, muscle pain, sneezing, sore throat, dry cough, high fever, respiratory problems, etc. with some severe cases having pneumonia, serious respiratory syndrome, kidney failure and even death [8,9]. The COVID-19 risk is greater in older people, kids and the patients having other health problems like lung diseases, heart diseases, diabetes, and cancer. It is important to mention that it is not necessary to have COVID-19 if these symptoms are seen because such types of symptoms are also seen in the case of other virus infections, except breathing and diarrhea problems. The pathological

conditions of corona virus include greater counts of chemokines, cytokines, and leukocytes, and high levels of plasma pro-inflammatory cytokines and C-reactive protein. The chances are greater of COVID-19 if there is shortness of breath, dry cough, and a person comes in the contact with a COVID-19 patient or traveled with COVID-19 affected area. Under such a situation, the clinical test for COVID-19 is a must. However, some persons recover easily while others may take some time depending on the health conditions and the age of the patients. WHO categorized the COVID-19 virus as of β -CoV of group 2B [10]. The genome of this virus is identified and it resembles the SARS-CoV (80% similarity) and MERS-CoV (50% similarity) [4,9]. It is interesting to note that both MERS-CoV and SARSCoV have their origin in the bats [11].

Modes of transmission

During the last few decades, it was observed that corona viruses can infect rats, mice, cats, dogs, horses, turkeys, cattle and pigs. Occasionally, these animals may communicate corona viruses to humans. The corona virus is spread by the sneezing, cough droplets and contact. Normally, this virus enters the body through the mouth, nose, and eyes. It has been reported that the virus may infect a person at a distance of about a 6 ft (1.8 m) radius. The virus can survive for 2 hour to few days in cough and sneezing droplets lying on the surface or ground. An infection may be by touching an object or surface which has already a virus but it is not the major course of the infection. This virus has been detected in stools of the patients but no infection via stool has been reported. The cellular infection model is very similar to SARS-CoV. The main target of this virus is lungs and the virus spikes (binding domains) get attached to the cell receptors of the lungs. These are known as angiotensin-converting enzyme 2 (ACE2) receptors [5,12]. Belouzard., *et al.* (2009) reported that a proteolytic cleavage occurs at SARS-CoV S protein at position (S2') interceded the membrane fusion and viral infectivity. The chances of the infection may arise if a person comes in contact with the infected person. Now, COVID-19 has become pandemic as per the WHO report. The data of the patients in the different countries at a different time was analyzed and the efforts are made to find out the routes of transmission globally.

Prevention and the management

The prevention and management are important issues to control COVID-19. Therefore, there is a great need for the collective efforts of the stakeholders and the government. The regular and the

proper care of the homes and hospitals are important to control this calamity. The regular recommendations to minimize the infection are cleaning of an area. The most important is to avoid sneezing and cough at the public place. The hand cleaning with soap and sanitizer, mouth and nose coverage with mask during sneezing and coughing are essential. Thoroughly washing foodstuff before cooking may help in this regard. The simple house-keeping disinfectants may kill the virus on the surfaces. Regularly cleaning of the surface by the disinfectants may control the virus outbreak. It is always better to avoid the close contact with anyone; suspecting respiratory problems symptoms like sneezing, coughing, breathing problem, etc. It is also advisable to stay at home if anyone has flue and common cold-like symptoms. It is also better not to go to school, work place and public places, not use public means of transport (aircraft, train, metro, bus, taxi, etc.). Some important suggestions may include avoiding travel, and collection at a particular place. The drinking of hot water after every hour may be helpful. Plenty of lukewarm water (~ 5 L per day) may help in this regard. The governments should provide facilities for the decontamination of the hands at the public places. The guidelines are available for healthcare providers, medical staff, researchers and public health individuals (Jin., *et al.* 2020). They can use to control COVID-19 globally. During the entire period of COVID-19, it was realized that this disease is spreading among those who are not taking it seriously and are not following the directions of WHO and the local government. Some people are trying to target one community for the spreading COVID-19 while this virus does not recognize and race, creed, sex, age, and religion. Therefore, it is urgently advised and requested that all the persons should follow the preventive measures, managements and quarantine strictly without any religious discrepancy otherwise the situation may be the worst.

Treatment

There is no precise treatment for corona virus but prevention, management and supporting healthcare may provide relief in the outbreak of COVID-19. However, some approaches of Ayurvedic treatment have been or may be used to control this disease.

Ayurveda treatment

At this time, there is no other specific treatments in any system of medicine for those who are in a critical condition. Even then the only recourses are the use of ventilators to help with breathing. Using Ayurveda management has no side effects and is working to

build up the immune system of patients who have used it. In short, there is nothing to lose. Some of the Ayurveda management and drugs are presented below:

Enhance agni (Digestive System)

Digestive system is the root for good health and well-being. A good digestive system is cause for long and healthy life with disease free. Ayurveda emphasizes that all the diseases are the result of weak Agni state in body. So the first principle of treatment in Ayurveda for all diseases is to strength the Agni. Drinking hot water is advocates by Ayurveda as it helps to improve the digestion of Ama (toxins). Ama is the cause for disease or infection [13]. Some herbs use to enhance the digestive system are Zinger, clove, cinnamon, black pepper, cardamom, cumin, fenugreek etc.

In initial stage for 3 to 5 days medicine provide to increase appetite is

- Shunthi jal -SOS
- Shadang Paniya SOS.
- Chitrakadi Vati: 2Tab *BD with luke warm water before meal.
- Trikatu Churna: 2 gm * BD with Luke warm water.

Herbs which may have the antimicrobial effects

It is observed that early deaths were in older people, probably because of the poor immunity, which fosters faster progress of COVID-19 [5,7]. Therefore, it is significant to boost our immune system. It is important to suggest that people should use some supplements to boost their immune systems. Healthy people should take plenty of citrus fruits having various vitamins. Some dry fruits (almonds, walnuts, and dates) are also useful to improve the immune system. However, senior citizen and the patients may take vitamins and zinc supplements with the consultation of medical practitioners. The important vitamins are A, C, D and E. It is also advisable to take zinc and iodine intakes.

Our immune system is the first line of defense mechanism which plays a vital role in keeping the diseases causing pathogens away from body. Ayurveda recommend that strong immunity is the outcome of healthy digestion. Immune boosting properties can help to deal with chronic stress and fatigue. Some herbs in Ayurveda that boost immunity are Zinger, Amala (*Indian gooseberry*) Tulsi (*holy basil*), Guduchis (*Tinospora cordifolia*), Shatavari (*Asparagus Recemosus*) and Ashwagandha (*Withania Somnifera*). Indian Institute of

technology (IIT) Delhi, in collaboration with AIST Japan have found that Ashwagandha may hold strong potential in fighting Covid-19 [14].

Some medicine given for immune booster is

- Ashwagandha Churna/Capsule: 3gm/1-2 tab *BD with luke warm water
- Chyavanaprash: 1tsf *BD (Sugar free for Diabetic patients)
- Guduchi Kwath 40-80 ml B.D.
- Yashtimadu Kwath 40-80 ml BD.
- Amalaki Churna; 3-6 gm is given in empty stomach at the morning with lukewarm water.

Antibacterial herbs

There are many herbs which are having anti-bacterial properties which are being using since long before in Ayurveda. These are Haridra (turmeric), Tulsi (*Ocimum sanctum*), Guggulu (*Commiphora mukul*), Lasuna (Garlic), Pipalli (*Piper Nigrum*), Dalchini (*Cinnamomum verum*). The different parts of the various plants are well known for a long time for their anti-viral activities [15-17]. An aqueous extract of these plants along with lemon juice and honey was found to be effective for flu and common cold virus infections. The ingredients present in this recipe have anti-viral properties [18].

Some medicine given to control sneezing, cough and fever are

- Chitraka haritaki OR Kantakari avaleha : 1tsf *BD with luke warm water
- Tab Lavangadi vati : 1-2 Tab; suck 4-6 times a day
- Amritarishta 15- 30 ml B.D. with equal amount of water after meal.
- Kankasav 15- 30 ml B.D. with equal amount of water after meal.
- Tribhuvan kirti ras 125-250 mg BD with luke warm water.

Source: Ayurveda and Alternative Medicine Guidelines of Preventive Measures and Management Protocol for COVID 19 in Nepal, 2020.

Mouth gargling (Gandusha)

In dinacharya (daily regimen), oral hygiene is explained in classical Ayurveda. Mouth Gargling have to removing order, enhance

the salivary secretion and increase the appetite [19]. Warm liquid and oils are used as gargling to cleanse the mouth and throat thoroughly. Mouth gargling with salt water turmeric helps to kill the germs of the mouth [20].

Nasal oil applications (Nasya)

Ayurveda has practice of application of medicated oil or ghee in nostrils. This is practice for the respiratory disease or to clean the pathway of naso-pharynx. This procedure is known as Nasya in Ayurveda [21]. Researcher of traditional Chinese medicine have already proof that used of nasal oil application for the prevention of SARS-COV 2 infections [22]. Applied Anu taila or Sesame oil 1TSF or cow's Ghee in both the nostrils (Pratimarsh Nasya) 2 times i.e. morning and evening.

Jala neti kriya (Nasal irrigation)

Jala Neti means guiding luke warm water through the nasal passages to cleanse the path. Jala neti is a traditional Ayurvedic and Yogic Practice that clears the nose and sinus passages through nasal irrigation. Neti helps in preventing and managing upper respiratory tract disease. During the practice of neti, water should pass only through nostril. Even if water enters the throat or mouth it does not cause any harm. In the whole process of jala neti, mouth should open to breath gently through mouth but nasal breathing should be avoid during whole process of jala neti. Nose and Mouth is the main portal of entry of droplets carrying the SARS-COV-2. So nasal irrigation with luke warm water and salt helps to cleanses the path way of droplet infection.

Before practicing jala neti, it is necessary to prepare saline water (put one teaspoon of salt in half liter of water). Water should not be too hot or too cold it should be as warm as body temperature (Figure 1).



Figure 1: Jal Neti Practice.

Yoga and meditation

The anti-inflammatory and other beneficial effects of meditation and yoga practices make them potential adjunctive treatments of COVID19 [20].

The study shows that Yoga and Meditation supports to modulate the stress and inflammation and also preliminary evidence for possible forms of immune system enhancement. Delhi's first corona virus survivor says pranayama was very effective for being treated for COVID-19. Pranayama (the breath control) is considering as one of the best for lungs and dealing with stress related disorders [23].

A number of studies stated that the regular practice of yoga and meditation with pranayama can help increase lung capacity for oxygen and manage health condition by improving the breathing difficulties in COVID-19 patients (Figure 2).



Figure 2: Yoga Practices.

Immunity boosting foods

- **Asparagus:** Asparagus is rich source of Vitamin C which builds up immune system and helps to fight the cold.
- **Yogurt:** Yogurt is dietary source of probiotics which boost immune system and good source of protein.
- **Drumsticks:** Drumstick is one of the super foods which helps in boosting your immunity and acts as a shield for any virus to grow.

- **Coconut water with lemon:** Intake of coconut water should always be fresh. When half a lemon to fresh coconut water is added, Vitamin C shoots up by 10 times.
- **Pumpkin seeds:** having three–four spoons of pumpkin seeds everyday can provide good quality of fats, Magnesium and Zinc which are vital for immune functions (www.msn.com/en-xl/news/other/covid-19-stay-safe).
- **Garlic, onion and turmeric:** These three are natural super foods that help to kill the pathogenic Bacteria which are growing in body system.

Ayurvedic herbs such as garlic (*Allium sativum*) peel, turmeric (*Curcuma longa*) powder, Carom or Ajwain (*Trachyspermum ammi*) seeds may also be a useful strategy for disinfection (<https://www.sciencedirect.com/science/article/pii/S097594762030019X>).

Socio-economic impact of COVID-19 pandemic

In the present scenario, COVID-19 has affected all the sections of the society. There is a big loss globally, and it cannot be estimated exactly. However, some aspects are discussed herein. Nowadays, the whole world is just like a family where everyone has to contribute to run the family. Similarly, the production of various items including medicines, machines, motor vehicles, computers, mobiles, etc. is controlled by many countries. Generally, the different components are being manufactured in various countries while these are assembled in other countries – Globalization. It is just like a chain process where the progress is stopped if even a single chain-link gets collapsed. It is a well-known fact that China is the biggest manufacturer of the various components, APIs and other raw materials while China is the most affected country due to COVID-19. And that is why the whole world is affected economically very badly due to a decrease in industrial production. The travel ban has been imposed by some countries resulting in millions of dollars loss to the airlines and tourism industry. There is a shortage of medicines, sanitizers, masks, medical instruments and other commodities, which has hiked the prices of these items many times. The various functions, especially international conferences, business meetings, sports events, fashion shows, and the marriage parties are suggested to avoid, which is a big social impact on society. The Kingdom of Saudi Arabia has provisionally banned Umrah (pilgrimage) for the pilgrims to Mecca and Medina. All these factors affected the local and global share markets badly. The USA big stock indexes such as S and

P 500 Index, NASDAQ-100, Dow Jones Industrial Average, etc. have shown sharp fall since 2008. Many countries have banned to attend the classes in schools, colleges, and the Universities and millions of the student are not getting a good quality of education. It is difficult to assess this loss in terms of money but has a big disadvantage to the students and their families. Briefly, there is a big loss to the worldwide economy and the expert assessed a loss of about 2.7 trillion US dollars (<https://www.bloomberg.com/graphics/2020-coronaviruspandemic-global-economic-risk/>).

Future perspectives

As expected SARS-CoV is zoonotic and originated from the bats. It is observed that many people are consuming various animals as foodstuffs. Some animals like bats, snakes, cats, mice, rats, dogs, pigs, etc. should not be consumed as these may have dangerous microbes while the only safe animals should be consumed. Moreover, it is also advisable that we should consume vegetables and fruits as maximum as possible in our diet. There is an urgent need to educate our new generation for science and technology to fight against any such disaster in future; if any. Of course, the world is progressing towards advancement and even then we don't have highly specialized research centers. Therefore, there should be highly specialized research centers under the umbrella of WHO and funded by all the countries of the world. These centers should be located in the various parts of the world and be efficient, capable and specialized to control any calamity in the world in the future. The most important required research centers are for viral diseases, bacterial illnesses, mosquito, and insect-based diseases, cancer, etc. These centers are essential to combat any future calamity in the world if any. A paper was published by Casanova, *et al.* (2010) and the authors studied the effect of temperature and humidity on the survival of gastroenteritis virus (TGEV) and mouse hepatitis virus (MHV) on the surface. The authors reported that the chances of the virus's survival are poor at 40 °C or high temperature with low humidity. Furthermore, the authors reported that TGEV and MHV could be used as conservative surrogates for modeling experience, transmission risk and control measurements for enveloped viruses like influenza virus and SARSCoV virus on the surfaces. Therefore, it may be expected that the propagation of SARS-CoV-2 will decrease at high temperatures and low humidity. Now, we are at the end of April 2020 and progressing towards the summer. Therefore, it is expected that the corona virus cases will decrease in the days to come; especially in the West Asian countries.

Perception mapping of local people towards COVID-19

When asked about the perception towards the government to management Covid-19 in the study areas, the respondents have scored 86 (57 %) for unhappy, 60 (40%) were happy and 4(3%) were no response. The study shows that the almost all respondents have found unhappy with the poor management of Covid-19. People have found really getting irritating and facing serious problems from the intolerable limit of present management of government. The local people have urged to government should strictly manage and save people from this pandemic. The happiness mapping tool was used to map out the perceptions of the local people towards role of government to manage covid-19 (Table 2).

Parameters	Frequency	Percentage
Very Happy	00	0
Happy	60	40
Unhappy	86	57
Don't Know	00	0
No Response	4	3
Total	150	100

Table 2: Perception mapping of local people towards the role of government to manage about Covid-19.

Source: Field Study, July 2020.

A total of 10 corn seeds assumed as 100 per cent were given to each respondent. The community perception was mapped out based on their direct observation, experience and best judgment of the respondents. This was measured in relative terms. The frequency represents the scoring of the respondents as simple, easily understood and adaptable parameters at local level [24,25].

Conclusions

COVID-19 disease is originated from Wuhan city of Hubei Province in China in December 2019 and has become pandemic. The disease has spread in 210 countries and territories with about 2.2 million patients and more than 0.15 million deaths globally. The United States of America is the most affected country with the highest patients of about 0.7 million. It is a viral disease due to the Severe Acute Respiratory Syndrome Corona virus 2 (SARS-CoV-2) viruses. The patients show flu-like symptoms with high fever and breathing problems. The disease due to SARS-CoV-2 was named as COVID-19. Still, there is no treatment of this disease. However, prevention and

management are the best options. Ayurveda medicine boosts the immune system so it supports to prevent the diseases. Probably, the number of COVID-19 cases may decrease in the coming days as the summer is approaching and the rate of virus transmission may be low at high temperature and low humidity. It was realized that this disease is spreading among those who are not taking it seriously and are not following the directions of WHO and the national governments. Therefore, it is urgently advised and requested that all the persons should follow the preventive measures, managements and quarantine strictly without any religious discrepancy otherwise the situation may be the worst. Also, there is an urgent requirement to educate our new generation for science and technology to fight against any such disaster in future; if any. There is no need to be panic and proper prevention and management are essential to combat this disease. Briefly, there is a need for collective efforts by all kind of system of treatment globally without any discrepancy to fight against such diseases in the future.

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