

Unlocking the Potential of Traditional Native Medicines - A Perspective to Manage the COVID-19 Pandemic

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Abstract

The last two decades have witnessed an increasing number of viral diseases/outbreaks in various parts of the world. The present scenario of fast-spreading and increasing Coronavirus disease (COVID 19) positive cases is creating a huge threat to the world community. The objective of this paper is to explain the various traditional medicines being followed to counter the viral infection along with other preventive strategies to create large awareness and confidence among the public about the beneficial effects of traditional native medicines. Initially, a real scenario of fast spread of Chikungunya, Dengue and other unknown viral infections, happened during the year 2017 in the state of Tamil Nadu; the southern part of India and the strategies adopted by the Government to counter the epidemic are explained. Further, the medicines being used by the public to counter various viral infections prescribed by the traditional medical practitioners are explained. The characteristics and the benefits of these traditional medicines in wide use are elaborated. All the patients who followed these traditional medicines particularly with *Nilavembu* (*Andrographis paniculata*) to counter viral infections during this epidemic got cured. In the recent days, there are several medicines of Siddha formulations used to counter respiratory-related viral diseases with the combinations of several leaves and roots of medicinal plants. The government of Tamil Nadu also started using one of these medicines named '*Kaba Sura Kudi Neer*' as supplementary medicine for corona affected patients after getting convinced by the positive response in the patients. Besides this, the paper also discusses other strategic methodologies to be adopted to overcome the present Covid-19 scenario by improving the overall immunity level in the human system. Under such a scenario, the information presented in the manuscript provides a new dimension of unlocking the potential of ancient traditional native medicine to manage the deadly corona pandemic and to receive the attention of the scientists to consider these medicine for further testing to make it as a suitable medicine for all the coronavirus affected patients throughout the world.

Keywords: *Coronavirus, Viral Infection, Siddha medicine, Nilavembu, Kaba Sura Kudineer*

Introduction

In recent years, the lifestyle of humans has changed appreciably with abundant energy usage leading to environmental damage. The environmental degradation is measured by the concentration level of CO₂ in the atmosphere.¹ The concentration of CO₂ in the atmosphere was 65 parts per million (ppm) at the time of the evolution of the earth. During the 18th century, before the industrialization started, this level was increased to 165 ppm, after several millions of years. In the last 250 years, this level has been increased to 365 ppm in 2000 and further increased to 416 ppm as of now.¹ During the last two decades, countries with major populations like India and China (approximately 36 % of the world population)² have increased their energy usage and further, it is

going to increase exponentially. Hence, the degradation of the environment is very fast. This resulted in several natural disasters and new infectious threats to human health. It should be noted that if the level of CO₂ increases beyond 600 ppm, human beings cannot exist on this planet.³ In the last two decades, the epidemics of infectious diseases are occurring more often, and spreading faster and further than ever, in different regions of the world. The reason is due to change in the lifestyle that leads to climate change leading to a biological imbalance in the system and thus we continuously learn about the unpredictable powers of nature.

The year 2018 marks the 100th anniversary of Spanish flu, the deadliest outbreak recorded in

history. Approximately 50 million people were killed which is more than the death toll from the First World War, similarly now the new corona pandemic is threatening the whole world. The other major pandemics during the 20th century were Asian flu (1957-58), and Hong Kong flu (1968-69) which killed 1 to 4 million people during each era⁴. However, in the recent 20 years, there were witnesses for several new viral diseases⁴ like Ebola, Lassa fever, Yellow fever, Crimean-Congo hemorrhagic fever, Zika, Cholera, Monkeypox, Plague, Chikungunya, Dengue, Avian influenza A (H7N9), HPAI A (H7N9), Swine flu, etc., which have created a huge threat to all developed, developing and underdeveloped nations.⁴

Now, the present COVID 19 pandemic has penetrated even in the developed nations and created a fear in the developing and underdeveloped nations. The major symptom of the coronavirus includes the similar kind of other viral infections like fever, sore throat, cough, mucus, sneeze, running nose, body ache along with an additional peculiar symptom of shortness in breathing.⁵ The present scenario infers that the newly infected cases and the death rates in all the countries are increasing appreciably day by day. Though it was started in December 2019 in China, it started spreading at a faster rate in Europe, USA and now in Brazil and India. The reason for the high spread in various climatic zones and the effect of the dry environment that makes the virus spread airborne is well explained recently using psychrometric chart.⁶

A new innovative drug has been introduced by Cuba called Interferon alfa 2B⁷ as a treatment for the coronavirus. This is used to treat various cancers (e.g., leukaemia, melanoma, AIDS-related Kaposi's sarcoma) and also used to treat viral infections (e.g., chronic hepatitis B, chronic hepatitis C, condylomata acuminata). Adding more interferon may help our body to fight for cancer or virus infections. Now a similar kind of medication is only used to treat the patients against corona. As per the present status, hydroxychloroquine (HCQ) has been making news again. US President has once again promoted the use of this drug as a cure for the COVID-19. Chloroquine phosphate is a class of drugs called antimalarials and amebicides and is used to prevent and treat malaria, according to the US National Library of Medicine. Governments believe that hydroxychloroquine tablets can work as a prophylactic, a medicine that prevents disease, for the health workers working on the frontline's in hospitals and as first responders to possible Coronavirus infection cases.⁸

The major objectives of the present work are to study and analyze how the earlier viral epidemic situation particularly in the state of Tamil Nadu, the southern part of India was handled effectively. Secondly, to study the various native traditional medicines used in the southern part of India and their characteristics to counter the various kind of viral infections. Further, it is aimed to discuss various strategies to prevent and control the viral infections that cause problems in the respiratory system like COVID 19 and finally to create awareness across the globe to unlock the potential of traditional medicines available in India to counter any kind of viral infectious diseases.

Methodology

In the present work, a detailed literature survey was made to understand the various epidemic/pandemic scenarios that happened in recent years at various parts of the globe and how one such epidemic was handled effectively in Tamil Nadu is analyzed. Following the survey, various types of traditional medicines being in use by the Siddha and Ayurveda practitioners for viral infections in the southern part of India and their characteristics and the potential of these medicines to counter these viral infections are investigated. Various base resources are used as a major tool in the present work to observe the composition of several potential native medicines. Further, the reports of WHO and other Government webpages were considered as the major source of material in understanding the rate of recovery in the present COVID 19 scenario at various places.

Based on the results obtained from the literature survey from various sources, the strategies to be adopted to prevent and control infectious diseases are analyzed and discussed. Further, the value of traditional medicines is explained through the concept of sustainability index and thus the need for furthering research to unlock the potential of traditional medicines to safeguard humanity from the infectious diseases is concluded.

Observations

Traditional Native medicines

In the year 2017, nearly 10,032 people in Tamil Nadu were highly affected by Chikungunya, Dengue (or) other unknown viral fevers. In many cases, the correct treatment could not be initiated, as the physicians were unable to test and identify the type of viral infection. However, later it was understood that patients who were using some

traditional medicines (*Nilavembu Kashayam*) got cured and awareness was received by the public about the value of traditional medicines.⁹ Later the Government of Tamil Nadu started providing *Nilavembu Kashayam* and the distribution was done by political and administrative officials is shown in Figure 1 a & b.⁹

Though, *Nilavembu Neer* (water) herbal medicine is not clinical proved, it was proved in the real scenario, by providing it to all viral infected patients, which showed beneficial effects in more than 10,000 people during the last two years. Now in all Government primary health centres located in Tamil Nadu, *Nilavembu Neer* is given to every patients with viral infections reported to the hospitals.

the following subsections.

Nilavembu (Andrographis paniculata)

Nilavembu Kashayam (herbal decoction), is a Siddha Medicine recommended for the prevention and management of several types of viral infections/fevers. It acts as an immunostimulant and immunomodulator, which boosts immunity and modulates defence response in the body, which helps to protect from infections and their complications.¹⁰ It contains herbal ingredients, which have antipyretic, anti-inflammatory, antiviral, and immunomodulatory actions. The major benefits of this *Nilavembu* are projected in Fig. 2.

Fig. 1 a & b: Distribution of *Nilavembu Kashaya* by the Government of Tamil Nadu during 2017 to prevent viral infections



Hence in the present scenario of Corona pandemic, *Nilavembu Neer* along with few other traditional medicines which are suitable for respiratory-related problems is being consumed by many people of the state as a precautionary measure. Some of the traditional medicines being used by the patients who get cold or any other symptoms during the recent days are elaborated in

Ramanathan et al discussed the method of formation of the *Nilavembu Kudineer* capsule which was prepared from *Nilavembu Churnam*, ethanol and water solvents extracts, and then the extract was dried. The dried extract powder was screened by various chemical and microbiological tests to ensure the potency. The results confirmed that the extract has active biomolecules and possess their activity.

Fig. 2: Benefits of *Nilavembu* leaves



Hence this capsule possesses a high level of potential to overcome the viral infections and to generate the antibodies that could fight against the viral or even bacterial infections. Particularly it is more suitable for viral infected patients with symptoms of body ache and pain in the joints. These symptoms are seen with patients affected by Chikungunya.¹¹

Papaya leaves

The papaya or pawpaw (*Carica papaya*) is a tropical fruit, which has been consistently associated with numerous medicinal properties. One of the most important of these claims is the ability of papaya leaf extract to revert low platelet counts to normal viral infections.¹² Several researchers have tested preparations of papaya leaf, in particular, regarding the platelet count. The leaf extract of papaya, prepared from dried or fresh ground leaves, possesses many compounds, such as flavonoids and other plant phenols. Thus, it is rich in antioxidant and free radical scavenging activity, as well as being able to stabilize the Red blood cell membrane. It may therefore have a protective role against hemolysis in stressful conditions. The study showed that papaya leaf extract is capable of neutralizing plasma containing dengue virus and reduces platelet aggregation significantly. The major benefits of papaya leaves are shown in Fig. 3. Hence it is more suitable for viral infected patients with symptoms of appreciable reduction in platelets counts. These symptoms are seen with patients affected by Dengue.

Tulsi

Tulsi or holy basil (*Ocimum Sanctum*) is undeniably one of the best medicinal herbs on the planet. The herb has miraculous properties; a few drops of Tulsi water dropped in foods can purify and kill germs as well.¹³ Tulsi planted indoors can protect the family from infections, cough, cold, and mainly destroys the viral infections. This basils are considered as

Fig. 3: Benefits of Papaya leaves



one of the best herbs that boost the human immune system and contribute to increase the WBC count in the blood, since it contains phytochemicals, bioflavonoids and anti-oxidants compounds, such as rosmarinic acid, which is a very good anti-microbial agent for treating infections in the respiratory tract. Holy basil is an excellent remedy for cough, soothes the throat, reduces the inflammation of the chest and helps to expectorate the mucus. The major benefits of basil leaves are shown in Figure 4. Normally, Tulsi water will be added with turmeric, Chitharathai (*Alpinia Galangal*), Ginger, and Pepper.

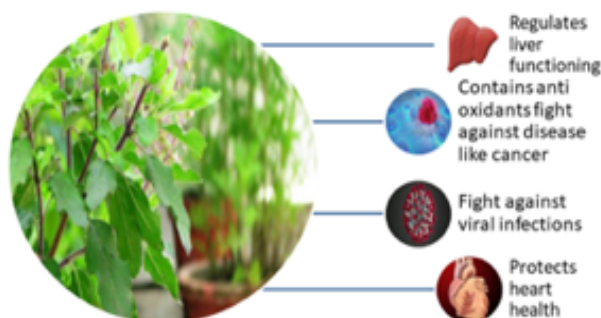


Fig. 4 Benefits of holy basil leaves

Turmeric, Chitharathai (*Alpinia Galangal*) and Ginger

Turmeric aids in making our immunity stronger, the main life-saving ingredient in turmeric is about 3-5 % of Curcumin; a phyto-derivative, which contains anti-viral properties. It is only due to the weak immunity that people are getting affected by the widespread coronavirus and other such viral pandemics. Turmeric is a good medicine for any symptoms results in bronchial asthma, congestion of nose and airway due to inflammation, cough, cold and occasionally, shortness of breath, affecting children, adults, and the elderly population. Inflammation constricts the airways and makes it difficult to breathe. This is often related to an exaggerated response by the immune system that leads to chronic inflammation and damage to lung tissue by free radicals.¹⁴ Chitharathai is used in various Asian cuisine and it is a traditional home remedy for cough, sore throat, and chest congestion. It is a good natural anti-inflammatory support and helps to improve blood circulation. Ginger is a spicy, pungent herb that is used for cooking and healing. One medicinal use of ginger, supported by both scientific studies and tradition, is for the treatment of sore throats.

Kaba Sura Kudi Neer

In the recent days, there are several medicines started coming as Siddha formulations to counter any respiratory-related diseases with the combinations of several leaves and roots of medicinal plants with medicine name as '**Kaba Sura Kudi Neer**'¹⁵ and '*Vaadha Surah Kudineer*'. Among these, the Tamil Nadu Government started using '*Kaba Surah Kudineer*' as supplementary medicine for corona affected patients. The ingredients in '*Kaba Surah Kudineer*' are *Adathodai* Leaf (*Justicia adhatoda*), *Akkirakaram* root (*Anacyclus pyrethrum*), *Karpoora Valli* leaf (*Plectranthus amboinicus*), *Thippili* (*Piper longum*), *Seenthil* climber (*Tinospora cordifolia*), *Korai* Tuber (*Cyperus rotundus*), *Siruthekku* (*Clerodendrum fortuneatum*), *Kostam* (*Cheilossetus speciosus*), *Nilavembu Samoolam* (*Andrographis paniculata*), *Kadukkaiskin* (*Terminalia chebula*), *Ilavangam* (*Cinnamomum verum*), *Mullai* root (*Jasminum sambac*), *Vettathiruppi* root (*Cissampelos pareira*), *Chukku* (*Zingiber officinale*), and *Kanjori* (*Tragia volucrata*) in equal proportions.

Many patients with viral infections during the 2017 epidemic have used the above said herbal medicines, as briefed in section 3.2 to 3.4, along with *Nilavembu* to counter the virus. All the patients who followed this herbal medicine got cured. Hence it is highly recommended to use *Tulasi*, *Turmeric*, *Chitharathai* (*Alpinia Galangal*), and *Ginger* for all viral infected patients along with *Nilavembu* for patients with body ache and pain in joints, *Papaya* leaf extract for patients with a reduction in platelet counts and *Kaba Sura Kudi Neer* for patients with respiratory-related problems.

Preventive strategies

Yoga offers another path, a fresh perspective with which to deal with events that are beyond our control. The main respiratory practice that we adopt conventionally is performing pranayama (breathing exercise). *Pranayama* is a systematic *Yoga* practice that helps to tackle the respiratory and breathing-related problems. At this juncture when the outbreak of this coronavirus is very high globally normally people must practice this kind of preventive strategy to keep them fit and healthy. It enhances and repairs the respiratory apparatus thereby making neuroendocrine mechanism efficient. It must be done initially under the direction of experts with 10-20 rounds twice a day.¹⁶

Mainly there are three different types of pranayama (i) *Anulom Vilom Pranayama* which is an option for nostril breathing that normally cleans the

internal energy channels and respiratory system. This method generally channelizes and balances neuroendocrine functions, contributing to the improvement in immunity, (ii) *Bhastrika*, a fundamentally different method from *Kapalabhati* which is a forceful inhalation and exhalation process and it is a balancing technique that helps in correcting the errors or any persistence of imbalance in three *Doshas* nothing but *Vata*, *Pitta*, and *Kapha*. (iii) *Kapalabhati* is a *Yogic* breathing technique that consists of short, powerful exhales and gentle inhales. This technique internally cleanses and tones the respiratory system of toxins while purifying, rejuvenating, and refreshing the body and mind. Since this involves breath-focused technique, some yoga practitioners classify this as *Pranayama* too. (iv) *Suryabhedhi Pranayama* in which right nostril inhalation and left nostril exhalation.¹⁷ Considering the several benefits of *Yoga*, Narendra Modi Ji, Prime minister of India, introduced *Yoga* to the world by celebrating the *Yoga* day annually on 21st June.

It is a common belief that oral health serves as a gateway to general health. This implies that oral health significantly impacts the general health and wellbeing of an individual. It should be noted that practicing saltwater gargle and oil pulling are the best practices to be adopted to prevent any viral infections through the throat. Oil pulling is swishing a tablespoon of oil in your mouth on an empty stomach in the early morning before brushing for around 20 minutes. This action supposedly draws out toxins from the body that improves one's overall health.

Discussion

The human community, now very clearly understood that the COVID 19 is a Severe Acute Respiratory Syndrome (SARS) Disease and it particularly induces the mucus formation that affects the respiratory tract, leading to death due to suffocation.¹⁸ In the war against this virus, two approaches are to be followed. The first approach is not to provide a conducive atmosphere for the virus to increase its load. Since this virus induces mucus formation, the first approach to prevent the conducive atmosphere for the virus growth is consuming only hot water and gargling with salt water frequently. Some varieties of banana and food varieties will induce the mucus generation and hence the consumption of such food also should be avoided.¹⁸ These are our traditional way of preventing cold and cough related problems. This approach is only preventing a fast increase in viral

load. However, the virus which entered already will induce the formation of mucus. Hence the second approach is to trigger the immune system to produce antibodies to fight against these viruses.

The human brain when it identifies any virus in our body, the signal will be given to the immune system immediately to control the virus. The sensing and control mechanism available in our human system has attained perfection through the genetic information recorded over several thousands of years.¹⁹ None of the measurement (sensors) and control mechanisms made for any engineering applications cannot approach the perfection that is available in the human system. The immune system produces the required antibodies through chemical action using the minerals and vitamins available in the body. In case of the deficiency of the required minerals and vitamins, the immune system will suffer to produce the required antibodies. These vitamins and minerals are normally available in many of the leaves, roots, fruits, and vegetables of the plants. Hence the herbs, Tulsi or holy basil (*Ocimum Sanctum*), turmeric, *Chitharathai* (*Alpinia Galangal*), Ginger and Pepper being useful to cure the organs in the respiratory system, the combination of these herbs in correct proportion, could be a good medicine to cure the corona affected patients. Further, the research studies from Siddha reveal that the suitable support system for the said COVID-19 could be by providing *Kaba Sura Kudineer*. As the name indicates, (*Kaba* means mucus, *Suram* means fever and *Kudineer* means drinking water), it is the medicine suitable for any respiratory infections and to reduce fever²⁰. This herbal drink will help to remove the continuous generation of mucus thereby clearing the disorder created by the virus in the respiratory system. Further, the required minerals and vitamins available in this herbal drink will be used by our immune system to generate the required antibodies.²⁰

Normally, any person having frequent troubles due to Asthma, Pneumonia, Lung Cancer, Chronic Bronchitis and other respiratory-related problems have lower immune power to counter the coronavirus²¹. Hence if they get affected, the virus will dominate easily and their immune system may not be powerful to control this virus. *Kaba Sura Kudineer* or other suitable medicines prescribed in the paper can be prescribed once in a week for these patients even without any symptoms for the coronavirus till the herd immunity is developed in the world for this virus. This will also help to eliminate their existing respiratory-related

problems. Further, by regularly doing the breathing exercises along with certain *Yoga* immune system functions can be improved.

Most of the ancient developments, the sustainable index is high and in the recent developments, the sustainability index is low.²² This is also true in any medicine development. In order to describe the sustainability index, the concept of entropy could be explained with any natural or manmade system/events, and then it is discussed in context with the traditional medicines. In any study, the matter within the boundary on which attention is focused is called system and the matter outside the boundary is called surrounding. As per the law of entropy, when any system is focused to achieve perfection it is possible only at the cost of making a higher level of disorder in the surroundings than the order of perfection achieved in the system. When a scientist is trying to discover or invent something in his field of interest, there is a boundary beyond which his/her knowledge level is limited. So when a scientist attempts to perfect or invent a system with his knowledge level, the matter which is very close to the boundary in the surrounding will get maximum disorder. Hence very recently scientists understood the need for sustainability in any development. (i.e. without making much disorder to the surrounding). It is also understood that in any fast actions the sustainability index is very low. Hence in any medicine developments which are aiming for fast recovery, the side effects associated will be more which are seen in the present-day conventional medicines. In most of the traditional medicines which were real tested over several centuries, though the recovery is slow, the side effects are minimal. All these medicines evolved through trial and error over a period using the medicinal plants that have good sustainability index must have very high value though it is forgotten by most of the people even in India due to various reasons. Hence furthering research is required to derive the correct medicine from the traditional medicine for a particular disease.

In the present emergency scenario, all the medical scientists and practitioners should take serious efforts to unlock the immense potential in traditional medicine to safeguard humanity from the corona pandemic. It is the responsibility of the scientists who are developing traditional medicines should test with different proportions and also with other combinations to develop a suitable medicine at the earliest to safeguard the affected patients throughout the world. The public is advised to

practice the preventive strategies suggested in this paper to get the required immune power and to avoid the infection not to emerge as a disease. Besides the threat, one glad information is that the researchers in New York have identified that their early results show Carbon monoxide mainly from cars had been reduced by nearly 50% on comparing the last year. Also, the CO₂ emission had fallen sharply. This implicitly means that the COVID 19 though a threat for human, it has turned as a boon for the nature.

Conclusion

The present review highlights some of the native medicines like *Nilavembu*, turmeric, *Tulsi*, ginger, papaya leaves, and *Kaba Sura Kudi Neer* being in use by the public as prescribed by the traditional medical practitioners in Tamil Nadu, to counter various viral infections. The characteristics and the benefits of these traditional medicines in wide use are also elaborated. In the present scenario, if a person realises with any symptoms of throat pain, cough, cold, or breathing-related troubles, it is highly suggested to go immediately with the intake of traditional medicines as explained in the paper. The preparation of the above-said medicines as *Kashayam* is available on several websites. Further one can initiate breathing exercises and continue as a sustained practice to prevent respiratory-related issues. One could confidently be construed from the real scenario that happened in Tamil Nadu that this medicinal combination works to counter for COVID 19 virus. Considering the high sustainability with traditional medicines it is the responsibility of all the medical scientists and practitioners to take serious efforts to unlock the immense potential in traditional medicine to safeguard humanity from the corona pandemic and also from any other viral infections.

References

1. Carbon-di oxide statistical data. [Internet]. [Cited on 13th Feb 2020]. Available from: <https://www.co2.earth/daily-co2>
2. World Population Statistics, Yearly statistics update [Internet]. [Cited on 13th Feb 2020]. Available from: https://en.wikipedia.org/wiki/World_population
3. Kevin Loria, Earth just hit a terrifying milestone for the first time more than 8,00,000 years, Bussiness Insdier, India. [Internet]. [Cited on 13th Feb 2020]. Available from: <https://www.businessinsider.in/science/environment/earth-just-hit-a-terrifying-milestone-for-the-first-time-in-more-than-800000-years/articleshow/64080483.cms>
4. World Health Organization Report, WHO. [Internet]. [Cited on 13th Feb 2020]. Available from: Managing epidemics, key facts about the major deadly disease, Report by the World Health Organization, 2018.
5. Hockmann and Wang, Statnews. [Internet]. [Cited on 20th March, 2020]. Available from: <https://www.statnews.com/2020/03/20/self-triage-tool-covid-19/>
6. Antony Aroul Raj, Velraj Ramalingam, Fariborz Haghighat, The contribution of dry indoor environment on the spread of coronavirus: Data from various Indian States, Sustainable Cities and Socities. 2020; 62(1023).
7. Drugs Sruvey Report, Webmed Drugs and Medication. [Internet]. [Cited on 31st May 2020]. Available from: <https://www.webmd.com/drugs/2/drug-37/interferon-alfa-2b-injection/details>
8. Priyanka Pulla. Nature. [Internet]. [Cited on 6th June 2020]. Available from: <https://www.nature.com/articles/d41586-020-01619-8>. doi: 10.1038/d41586-020-01619-8.
9. Ashwini Mohan. Ancient siddha medicine nilavembu kudineer effective against dengue and chikungunya shows research. [Internet]. [Cited on 13th Feb 2020]. Available from: <https://swarajyamag.com/insta/ancient-siddha-medicine-nilavembu-kudineer-effective-against-dengue-and-chikungunya-shows-research>.
10. Ashwin Mohan, Swarajya. [Internet]. [Cited on 13th Feb 2020]. Available from: <https://www.ayurtimes.com/nilavembu-kudineer-nilavembu-kashayam/>
11. Ramanathan, Subramanian, Poongodi, and Manish. Formulation and evaluation of Nilavembu kudineer capsules. Asian Journal of Pharmaceutical Research and Development. 2019; 7(1): 41-45.

12. Liji Thomas. Meical Life Science. 2019. [Internet]. [Cited on 13th Feb 2020]. Available from: <https://www.news-medical.net/health/Papaya-Leaf-Extract-and-Platelet-Count.aspx>.
13. Tulsi Immune Booster. [Internet]. [Cited on 1st July 2020]. Available from: <https://www.netmeds.com/health-library/post/tulsi-immune-booster-for-this-monsoon-season>.
14. Clinical Express. [Internet]. [Cited on 1st July 2020]. Available from: clinancialexpress.com/lifestyle/health/use-power-of-turmeric-and-boost-your-immunity-with-curcumin-in-the-time-of-viral-infections/1899124/
15. COVID 19: TN Sees two deaths more recovery than new cases. [Internet]. [Cited on 23rd April, 2020]. Available from: <https://www.outlookindia.com/newscroll/covid19-tn-sees-2-deaths-more-recovery-than-new-cases/1812728>.
16. Shyam Karthik, Chandrasekhar M, Kondam Ambareesha, Nikhil C. Effect of Pranayama and Suryanamaskar on Pulmonary Functions in Medical Students. Journal of Clinical Diagnostic Research. 2014; 8 (12); 04 – 06.
17. Yoga Addicts. [Internet]. [Cited on 22nd June 2020]. Available from: <http://www.yogaaddicts.in/pranayama.html>.
18. Jiang Gu, Christine Korteweg, Am J Pathol, Pathology and Pathogenesis of Severe Acute Respiratory Syndrome. 2007 Apr; 170(4): 1136–1147.
19. Koyuncu OO, Hogue IB, Enquist LW. Virus infections in the nervous system. Cell Host Microbe. 2013;13(4):379-393.
20. Kabasura Kudineer, Benefits, Ingredients and Side effects, of this wonderful herbal formulation. [Internet]. [Cited on 6th May 2020]. Available from: <https://www.netmeds.com/health-library/post/kabasura-kudineer-benefits-ingredients-and-side-effects-of-this-wonder-herbal-formulation>.
21. Risks for Severe Illness from COVID, Centre for Disease Control and Prevention. [Internet]. [Cited on 23rd June, 2020]. Available from: <https://www.cdc.gov/coronavirus/2019-ncov/need-extra-precautions/asthma.html>
22. Ben Purvis, Yong Mao, Darren Robinson. Thermodynamic Entropy as an Indicator for Urban Sustainability? Procedia Engineering. 2017;198:802 – 812.

Source of Support: None declared

Conflict of Interest: None declared

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2015-2020

Published by Likhita Medical Publications (OPC), Pvt. Ltd (R)

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