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Efficacy of steam inhalation as a prompt solution in combating COVID-19: A literature review

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Abstract

As the Pandemic COVID-19 is a Public Health Emergency all over the world and due to the unavailability of effective treatment, the mortality rate is very high from this disease. So, a prompt solution is required for combating such a pandemic situation. As the COVID-19 shares the genetic similarity with SARS-CoV and MERS-CoV as 79% and 51.8% respectively. Both of these two types of Coronaviruses are sensitive to the High temperature and weather conditions. In the same way, temperature variation and Humidity may be an important factor affecting COVID-19 mortality. Some other types of Human Coronaviruses (HCoV-229E, HCoV-HKU1, HCoV-NL63, and HCoV-OC43), which generally cause common cold symptoms, have been shown to display strong winter seasonality and are invisible in summer months in temperate counties. This brief literature review defines temperature and humidity are countable factors in COVID-19 mortality and thus we can control this pandemic disease with a tool of these two factors i.e. applying the warm environmental conditions and raising the humidity artificially. Here are two ways for to apply this strategy; (1) Infected Person, i.e. the case in which the virus is inhaled in our respiratory tract, through the nose, throat, trachea, Bronchi, even in our Lungs, by inhaling the hot water steam the virus survival, replication will be reduced and making it less infective due to facing unfavorable environment several possible mechanisms stopped. (2) By using the Hot electric heaters and appliances in our living places, in this way we made the environment unfavorable for the virus and thus preventing its transmission to the healthy community. So, the effective and urgent solution in combating COVID-19 is reducing its survival, replication, and infectivity by controlling the temperature and humidity factor artificially to inhibit its further transmission to a healthy community.

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Introduction

A viral pneumonia outbreak caused by COVID-19 originated in Wuhan City, in late December 2019. This COVID-19 infection has rapidly spread from Wuhan China to other countries and now mostly all around the world. On 11th March 2020, The World Health Organization (WHO) declared this disease as a pandemic. The representative clinical symptoms of the patients who suffered from the COVID-19 were fever, cough, and myalgia or fatigue with anomalous chest CT and the less common symptoms were sputum production, headache, hemoptysis, and diarrhea (Wang *et al*; 2020).This new infectious agent is more likely to affect older males and immune-compromised individuals resulting in severe respiratory diseases. Clinical features of this disease vary in different cases, and some patients showed asymptomatic infection. Recent studies have confirmed the human to human transmission of 2019-nCoV (Phan *et al;* 2020). More importantly, asymptomatic cases could transmit the virus to other individuals, notably, a report of one case of 2019-nCoV infection in Germany specifies that transmission of the virus may also occur through contact with asymptomatic patients. So due to its very high transmission rate and also asymptomatically transmission, it becomes more difficult in controlling the fast spread of the virus in infected countries. This challenge of asymptomatic transmission can't be solved by increasing the testing alone. In developing, countries test facilities demand even can't be fulfilled according to need due to the short supply of testing kits available for COVID-19 detection. There required another way in controlling the asymptomatic transmission of COVID-19 (Wang *et al*; 2020).

Moreover, the main issue is that currently, no specific treatments exist nor are recommended for patients with COVID-19 several vaccines are under study, including DNA-based, vector-based, and protein-based vaccines the teams of researchers have to face some big challenges in developing (COVID-19) vaccines, both scientific and logistical. One of the most pressing: understanding how the immune system interacts not only with the pathogen but with the vaccine itself crucial perceptions when struggling to develop a safe and effective vaccine. Still, several teams of researchers are working in parallel with a diverse set of strategies to develop a potent and hopefully harmless vaccine but it takes too long. An in vitro study found that remdesivir and chloroquine obstruct viral infection, but further study is required (Lu *et al;* 2020). A study evaluating lopinavir-ritonavir found no improvement in patient survival or differences in detectable viral RNA.(13) Hydroxychloroquine and azithromycin are also under investigation. Some other Drugs under study include tocilizumab and favipiravir. There are no clear data supporting harm or benefit with angiotensin-converting enzyme inhibitors or ACE receptor blockers (ARBs) (Zhang *et al;* 2020) Clinical trials of experimental drugs and antiviral are underway, although none are at present approved by (FDA) U.S. Food and Drug Administration. Unless authorized through a clinically approved trial or Monitored Emergency Use of Unregistered Interventions Framework (MEURI), unlicensed treatments should not be directed. Continuous renal replacement therapy (CRRT), extracorporeal membrane oxygenation (ECMO), and immunoglobulin have been utilized for management, but have not been ultimately shown to be most advantageous (Fang *et al;* 2020) COVID-19 is an emerging condition that threatening the biosecurity conditions of all countries. As the fight against COVID-19 gets more serious globally as the number of cases reported and deaths increasing day by day. So, an urgent solution required to overcome this Pandemic COID-19 Disease. There required a solution that will work in a two-way direction by prohibiting its transmission to a Healthy community and also work by reducing COVID-19 infection.

Whether it is Important in Relating the COVID-19 with lower humidity level and High-Temperature Weather Conditions

Some recent studies suggest that cold temperatures can increase the number of respiratory-related deaths. A study in South-East England has reported that low daily temperatures were associated with

excess deaths from respiratory disease in people >50 years of age. Adenoviral deoxyribonucleic acid has been detected in airways of patients with COPD and reactivation of latent viral infection with cold temperature could also induce airway inflammatory changes (Matsuse *et al*; 1993). Probably extreme temperatures can have an impact on mortality rate, especially in the very elderly and ill individuals.

Other researchers found that seasonal changes in temperature adjusted for other variables can cause changes in respiratory disease relapse and overall and specific cause mortality. In a study in the USA, these effects were more prominent among the elderly (Kalkstien *et al;* 1889). In a study in Kerman, Iran which has a desert climate, results showed a significant inverse relationship between respiratory diseases and temperature-related deaths, and with the decrease in ambient air temperature respiratory-related deaths increased. Nafstad *et al*. showed that in Oslo Norway at temperatures below 10 °C, per 1 °C decrease in average temperature over the last 7 days, respiratory deaths increased 2.1 %.

If we observe the trends of other cold viruses including the influenza virus which also shows the temperature seasonality. A recent study shows Lower temperatures are also an indirect cause of influenza and cold-related mortality (Alberdi *et al;* 1998). Some studies in Iran and other countries have also mentioned that influenza causes increased mortality in the cold months and have reported some of these influenza epidemics. A study in Korea found that the risk of influenza incidence was significantly increased with low daily temperature and low relative humidity, a positive significant association was observed for diurnal temperature range (DTR) (Park *et al;* 2020). Rhinoviruses, which are responsible for an estimated 40% of common colds in adults, are also seen to be sensitive to hot weather conditions. A study shows that high temperature also is known to be detrimental to the infectivity of rhinoviruses. Notable that some Human coronaviruses (HCoV-229E, HCoV-HKU1, HCoV-NL63, and HCoV-OC43), which usually cause common cold symptoms, have been shown to display strong winter seasonality between December and April, and are undetectable in summer months in temperate counties (Gaunt *et al;* 2010). Some studies have shown that the alphacorona virus HCoV-229E peaks in the fall, while HCoV-OC43 (a beta coronavirus in the same genera as SARS-CoV-2) has winter prevalence (Vebart *et al:* 2003).

And the SARS-CoV-2 is just like MERS-CoV and SARS-CoV are classified in beta-coronavirus family members. Recently published research submits that SARS-CoV-2 shares 79.0% nucleotide identity to SARS-CoV and 51.8% identity to MERS-CoV. Representing a high genetic homology among SARS-CoV-2, MERS-CoV, and SARS CoV.-And MERS-CoV are more stable in cold and dry conditions; low temperature and low humidity leads to an increase of suspended matter in the atmosphere, facilitating ideal conditions for virus attachment, replication, and transmission while the low temperature can also dry out the mucous membrane, reduce the function of cilia, and support the survival and transmission of the virus and the spread of diseases (Qi *et al;* 2020). One possible reason might be that both low Atmospheric temperature and humidity make the nasal mucosa susceptible to small ruptures, creating opportunities for virus invasion. It was predicted that the temperature and its variations might have affected the SARS outbreak. And some others have reported that infectivity of SARS-CoV (SARS coronavirus) was lost after heating at 56◦C for 15 minutes (Lai *et al;* 2005). A study confirms that high temperature at high relative humidity has a synergistic effect on inactivation of SARS CoV viability, although lower temperatures and low humidity support prolonged survival of the virus on contaminated surfaces, which might facilitate the virus transmission in a healthy community. So, in the same way, low temperature and low humidity may also be a factor in the asymptomatic transmission of COVID-19, this can lead to the virus transmission more badly if this factor is not taken into consideration. Some recent studies have also done which is also the clue for the low-temperature favorability for this Pandemic COID-19. Countries and cities with cold winter temperatures

showed a rapid spread (Italy, UK, etc.) compared to warm countries (e.g., countries from the Indian subcontinent and African continent) (Kim *et al;* 2007). Scientists confirmed that respiratory infection was enhanced during unusually cold and low humidity conditions (Davis *et al.*, 2016); demonstrating low humidity might also be an important risk factor for respiratory diseases.

Consistent with these findings, the results of one study specify that the risk of dying from COVID-19 decreases only with absolute humidity increasing. Breathing dry air could cause epithelial damage and reduction of mucociliary clearance, and then lead to rendering the host more prone to respiratory virus infection (Ma *et al;* 2020). A Study reported the increase of COVID-19 mortality may also be related to the lower humidity in winter. The current spreading rate tells us one fact, that COVID-19 has a greater impact in places where the environment is drier and colder than in places where the environment is wetter and warmer. Therefore, there is a similarity between measurements of mean temperature (5-12°C) and relative humidity (47-79%) in affected countries and the conditions that favor coronavirus survival (4°C and 20-80% relative humidity) (Casanova *et al;* 2020). In summary, this study suggests the temperature variation and humidity may also be important factors affecting COVID-19 mortality and its asymptomatic transmission. So, this Temperature factor will take into consideration deeply to control this Pandemic COVID-19 all around the World mostly in low temperature infected Countries.

How it will be in relating the Hot Weather conditions with the immune system of an individual and then its impact on COVID-19 Mortality

COVID-19 is a novel coronavirus that has affected an unprecedented number of people to date. Patients typically present with a combination of fever or cough and have a history of exposure to any close contact with COVID-19 or travel to an affected geographic area. Although most patients will have mild disease, some may develop severe complications including ARDS and multi-organ failure, with some succumbing to the disease (Chavez *et al;* 2020). The longest possible incubation period for COVID-19 is thought to be 14 days from initial exposure. The mean incubation period is 5.2 days (95% CI 4.1-7.0) but can range from 2 to 14 days. Co-infections occur in 22-33% of patients and may be higher in serious patients (Wang *et al;* 2020). The symptoms of COVID-19 are analogous to other cold viral upper respiratory illnesses and include fever, cough, fatigue, and dyspnea. The frequency of lymphopenia found suggests that COVID-19 might act on lymphocytes, particularly T lymphocytes, as does SARS-CoV, possibly including depletion of CD4 and CD8 cells. Virus particles spread over the respiratory mucosa, initially using the ACE2 receptor at ciliated bronchial epithelial cells, and then infect other cells. This induces a cytokine storm in the body and causes a series of immune responses that cause changes in peripheral white blood cells and immune cells such as lymphocytes (Zhou *et al;* 2020). In another case, the ablation of IFN-α/β receptor or the depletion of inflammatory monocytes/macrophages caused a marked rise in the survival rate of coronaviruses host without a change in viral load. Dengue is a flavivirus, a family of viruses that are known to infect macrophages. FIPV also infects macrophages. ADE is unlikely to occur in the current coronavirus, Graham claims, as it does not target or grow in macrophages. Somewhat, SARS-CoV-2 primarily infects the respiratory epithelial cells, which present different receptors (Ricke *et al;* 2020). Risk factors for severe COVID-19 disease include old age, chronic medical situations, immunocompromise, and cancer. Data related to pregnancy and COVID-19 are limited. Pregnant women and fetuses may be more susceptible to COVID-19 infection compared to the general population. Newborn infants are also at-risk populations (Qiao *et al;* 2020). A review for cold exposure and immune function reported that lower temperatures may suppress the immune function. Studies reported that respiratory disease mortality increased with decreasing temperature (Ghalhari *et al;* 2019). In particular, our previous finding suggested that the phagocytic function of pulmonary alveolar macrophages declined under cold stress in

vitro experiments. Breathing cold air can lead to bronchial constriction, which may promote susceptibility to pulmonary infection (Martens *et al;* 1998). Additionally, since SARS-CoV-2 is sensitive to heat and high temperature makes it difficult to survive, not to mention the beneficial factors for virus transmission like indoor crowding and poor ventilation in cold days. Also, the cold temperature has been discovered to be associated with the reduction of lung function and increases in exacerbations for people with

COPD (Donaldson *et al;* 1998). Adenoviral deoxyribonucleic acid has been detected in airways of patients with COPD and reactivation of latent viral infection with cold temperature could also induce airway inflammatory changes. This study has demonstrated that a cold environment, whether during an outdoor excursion or indoors, was associated with a reduction in Spirometric values The interaction of reduced lung function and exacerbation during cold weather may contribute to the high cold-related morbidity and mortality in chronic obstructive pulmonary disease patients who are already suffering from chronic respiratory disability and increased susceptibility to respiratory failure (Donaldson *et al;* 1998). In addition to their effects on the virus, temperature and humidity may affect the host site of the host-pathogen equation by altering susceptibility to influenza virus infection or the course of disease following infection Cooling of the nasal epithelium through inhalation of cold air has been shown to inhibit the mucociliary clearance and may limit phagocytosis by innate immune cells resident in the upper airways. Similarly, inhalation of dry air for a 30 min period was found to slow mucociliary clearance significantly.-Both cold air and dry air are thought to alter the rheological properties of mucus (Salah *et al;* 1998). At lower temperatures, cellular metabolic functions are also slowed which in turn may decrease the frequency of ciliary beats, reduce mucus secretion, and restrict phagocytosis (Fraser *et al;* 1997). So, we hypothesis that cold temperature seasonality is favoring the COVID-19 in invading the immune system of an individual easily. As a vaccine is designed to boost our natural immune response to an invading virus by priming it to recognize antigens, unique molecules found on the surface of pathogens so, in the same way, we have to Boost up our natural Immune System by Different Methods such as A healthy Food, etc. So, we can add to this By feeling to Our Self In Warm Environment And Also to Realize the Virus in Warm Environment, Which Will loosen its Infectivity, Reproduction rate, and rapid transmission By exposure to Hot Water Vapors (Steam therapy).This Hot and humidified vapors will also prove beneficial in case of dry cough etc., which will boost up our immune system in fighting against COVID-19 and secondly preventing its further transmission to a healthy community.

The prompt solutions for combating this pandemic COVID-19

Steam Inhalation/ Steam Therapy/ Inhaling Hot Water Vapors and its efficacy

Steam inhalation is a common home therapy for upper respiratory tract infections. GPs recommend it, and it is included as a recommendation in guidelines and patient brochures issued by societies of GPs, among others, in the Netherlands, US, and UK (Fraser *et al;* 1997). The common cold has been treated for decades with inhaled steam to help the mucus drain more easily. There is laboratory evidence that the cold virus may be sensitive to heat, but no large-scale clinical trials have tested its efficacy. Inhalation of humidified warm air has long been regarded as an effective means of alleviating cold symptoms. Elevation of intranasal temperature is reportedly effective in reducing nasal resistance, whereas exposure to cold air causes increased nasal resistance (Olsson *et al;* 1885). In 1987 D o v OPHIR, MD, and their colleges studied the effects of steam inhalation on nasal patency and nasal symptoms in 62 patients with the common cold by a double-blind, randomized, placebo-controlled clinical trial. Treatment consisted of two 20-minute sessions, during which the patient inhaled saturated, hot (42-44-degree Celsius air through the nose. The individual response was noted by each patient during the week following treatment on a daily symptom

scorecard. Nasal patency was determined before treatment, the following day, and 1 week later by measuring the highest nasal expiratory and inspiratory airflow. Highly reproducible results were found by using these objective methods (Ophir *et al;* 1987). Steam inhalation resulted in alleviation of cold symptoms and increased nasal patency in a significantly higher percentage of patients in the actively treated group than in the control group, Forstall 1994 demonstrated increased nasal resistance one week after steam inhalation. This was analogized with an earlier study that showed improvement in nasal resistance. Lwoff 1969 proposed that raising the mucosal temperature to 43 °C for three 30-minute periods can block rhinoviral replication and stop the common cold (Lowoff *et al;* 1969). Studies of the effect of heated, humidified air recommend that raising nasal mucosal temperature may inhibit rhinoviral replication (Ophir *et al;* 1987).

Several possible mechanisms may account for the relief from common cold symptoms experienced by the patients. One may be Hyperthermia, which is a reaction of humans and many animal species to infection. Its mechanism of action probably is through enhancing general and local host defense mechanisms. It has been shown, for example, that elevated temperature potentiates the antiviral activity of interferon as well as its immunoregulatory effect on suppressor cells (Ron *et al;* 1984). Another possible mechanism of action of hyperthermia is through the effect of elevated intranasal temperature on mucosal mast cells. The process of degranulation of mast cells with accompanying secretion of pharma coactive mediators that cause the normal allergic responses of sneezing, nasal stuffiness, and rhinorrhea also may be induced by a viral infection of the upper respiratory tract, causing the same symptoms. According to one study nasal inhalation of hot humidified air (steam) may reduce nasal symptoms associated with common colds. Transient amelioration of nasal obstruction during or immediately following steam inhalation is perceived by many people. Sustained benefit for up to 7 days has been reported by patients with coryza following inhalation of steam generated by machine (Yerushalmi *et al;* 1980). One study reported Rhinoviruses, which are responsible for an estimated 40% of common colds in adults, replicate better at 33°C to 34°C than at 37°C. These viruses might be affected by raising the temperature of the nasal mucosa by steam inhalation. Another mechanism of action of steam inhalation in the killing of a virus may be, a virus is enveloped and heat can dissolve the lipid bilayer of the virus. Recently, numerous reports have shown that the lipidation strategy can effectively improve the antiviral activity of fusion inhibitory peptides, such as the antHIV-1 peptide LP-19,(87) and the anti-Nipah virus lipopeptides. The lipopeptide EK1C4 exhibits the most potent inhibitory activity against membrane fusion mediated by S proteins and the entry of pseudotyped coronaviruses (Xia *et al;* 2020). So, this may be a possible mechanism, for which further study is required. While from years this steam inhalation has been using although it seems to have some beneficial effects in the case of the influenza virus also, no clinical trials were reported in the literature available. We hope that this steam inhalation will also prove effective against pandemic COVID-19 in two ways by loosening its infectivity i.e. reducing its mortality and also by reducing its further transmission to a healthy community.

Side effects of steam inhalation: Some cases reported of Burns due to steam inhalation are discussed here for warning to use too hot steam. At the burn centers in the Netherlands, 31 patients were admitted with burns caused by steam inhalation therapy in the 1998–2007 periods from the 1998–2007 records of the emergency departments 292 patients with thermal injury due to hot liquid or hot vapors were identified. In 49 patients, the injury was indeed associated with steam inhalation therapy Barich *et al* identified two children with burns due to steam inhalation therapy out of 23 children (9%) during 5 months. Murphy *et al* described seven children (also representing 9% of all children admitted) with burns due to steam inhalation therapy for 6 months (Murphy *et al;* 2004). Wallis *et al* found 27 children with burns related to steam inhalation therapy, of

which were scalds from hot water spills; and 10 were contact burns from contact with the steamer. Inhalational injuries are commonly associated with burns to the head and neck and with fines on accidents happening within an enclosed space. Inhalational injury greatly increases mortality in burn victims and can be the major cause of mortality. Stnidor, hoarseness, difficult phonation, or burns around the lips are important clues to airway injury. Surface bums to the airways below the glottis are rare except in cases of inhaled steam or explosive gasses (Casanova *et al;* 2020). Because the heat-carrying capacity of steam is 4000 times that of heated air, inhaled steam can rapidly outstrip the cooling capacity of the upper airways and cause deep surface burns, even extending to the lower airways. Inhalational lung injuries usually cause diffuse pen bronchial thickening and pulmonary edema attributable to epithelial injury and capillary leak. Only steam is capable of inflicting direct thermal damage to the lower airways, causing pulmonary insufficiency due to greater heat carrying capacity (Moritz *et al;* 1945).

The histopathological changes range from rapidly fatal obstructive edema of the glottis, severe thermal tracheitis, and destruction of the bronchial mucosa, to hemorrhagic edema of the centrally located alveoli. Although Brinkmann and Puschel found homogeneousness in pathological findings in patients with steam inhalation, they could not find any contributory cause to death, They concluded that the acute changes in these patients were due to severe lesions of the alveolar-capillary membranes which contributed to the hemodynamic dysregulation, hypoxia and shock Their theory of a direct thermal effect was supported by the findings of acute lesions in the central part of the lung (Donaldson *et al;* 1998). An animal study using dogs, done by Aviado and Schmidt presented amazingly different responses to steam inhalation affecting the upper and lower respiratory tracts. All dogs in this study died within 2 h of injury. The most consistent effects during steam inhalation were apnoea, bradycardia, and arise in carotid blood pressure. They were often interrupted after a minute or so by polypnoea and bradycardia. One prominent sign was increased respiratory minute volume, probably by reflexes mediated by sympathetic nerves from the lungs. The mechanism of these respiratory and circulatory events may be respiratory reflexes or medullary stimulation. Blood hemolysis was more extensive than that run into cutaneous bums. The authors believe that the difficulties in treating pulmonary congestion and edema after steam inhalation are due to the failure of the compensating mechanism that usually stabilizes the lung volume and injury to pulmonary vessels by heat (Moritz *et al;* 1945). So, the use of too hot water is strictly prohibited to avoid burns. After boiling the temperature of the steam will be the same as that of water say 100 degrees Celsius which can cause damage after inhaling, always use 45-50 degrees' Celsius hot water for safe inhaling which is enough for this purpose of steam therapy i.e. in making the environment unfavorable for the virus. Avoid allowing the steam to make contact with your eyes. So, your eyes should be closed and directed away from the steam.

By using hot electric heaters and other hot appliances

As the high-temperature weather conditions are a countable factor for the rapid transmission of COVID-19, So we can also artificially produce hot Environmental conditions by using hot electric heaters and some other heating appliances in our living places i.e. in our houses in rooms, offices, Banks, Hospitals and this will prove a great benefit in preventing the viral transmission. In cold temperature infected countries all the People either healthy or infected from viruses should come close to a portable heater with a comparatively high temperature for say, twice a day and preferably for half an hour. It was also noted that 28.6% of our patients had developed COVID-19 infection during hospitalization and nosocomial transmission of SARS-CoV-2 was suspected. Hospital-related transmission has been reported in both patients and healthcare workers. In a retrospective case study with 138 patients, 41.3% of the patients were reported to

have acquired COVID-19 infection during hospitalization, and out of these, 5 patients were from the oncology department (Wang *et al;* 2020). So the disinfection of the hospitals is very important but should be done this time with the hot temperature. So Also disinfect most places as possible using high temperature Before the start of office, Banks, business including hospitals the temperature of the premise may be kept, say, 40°C for sometimes (say, half an hour) to disinfect. This will lead to making the environment unfavorable for the COVID-19 and thus preventing from Viral infection, reproduction of the virus, and its Rapid transmission. The asymptomatic transmission which is a big challenge in infected countries we hope that, apart from social distancing and hand washing, etc., by implementing these two methods of Steam inhalation and hot appliances in our living places with an emergency basis worldwide will inhibit the spreading of this pandemic COVID-19.

Discussion

The COVID-19 is an emerging condition that primarily threatens the preparedness and biosecurity conditions of all countries in the world. The major source of infection is the infected patients and asymptomatic SARS-CoV-2 carriers seem also a potential source of infection. Patients with mild symptoms and no significant comorbidities without concern for the deterioration of clinical condition may be candidates for discharge, self-quarantine for two weeks, and home monitoring (WHO; 2020). These patients must have the ability to be safely isolated at home to prevent transmission to others and be carefully monitored. Upwards of 80% of patients who contract COVID- 19 develop only mild flu-like symptoms. “The immune system fights off the virus and people might hardly notice,” says Darrell Ricke (Ricke *et al;* 2020). Old age, chronic medical conditions, immunocompromise, patients are only at more risk. We can solve this problem by adding into our immune system and by making the environmental conditions unfavorable for the virus replication by our self and thus also reducing its infectivity and preventing its fast spreading. Steam inhalation is using for decades for common colds. This no doubt has some beneficial effects in reducing the symptoms and making an early recovery from colds. Lwoff proposed that raising the mucosal temperature to 43°C for three periods of 30 minutes at intervals of two hours would block the replication of rhinoviruses and so abort common colds (Xia *et al;* 2020). Although steam inhalation is commonly suggested as a treatment for infection of the upper respiratory tract in children, the evidence that it has any beneficial effect on the course of the illness is limited. A Cochrane review of the use of heated humidified air for the common cold concluded that the current evidence does not show any benefits or harms from the use of heated, humidified air delivered via the Rhino therm device for the treatment of the common cold. There is a need for more double-blind, randomized trials that include standardized treatment modalities. However, not only is there no proven benefit, steam inhalation therapy can have severe adverse side effects, such as burn injuries, the usual scenario being overturning the bowl of steaming water, with the water ending up in the person's lap, causing severe scalds in sensitive body areas, such as the lower abdomen and genitals (Wang *et al;* 2020). Another study shows No effect of two 30-minute treatments with hot humidified air on rhinovirus reproduction evaluated both by viral titers in nasal washes and by frequency of positive cultures was noticed. It is founded no difference in the proportion of volunteers shedding rhinovirus in the 3 days following three 30-minute periods of treatment with humidified air, delivered by mask, at 43°C vs. 30°C. But we concluded that If scholars think that at high temperature, say if reaches above 30°C, the virus will not survive, which is a misconception, because at this temperature the virus survival will reduce and does not mean that the virus will fully eliminate (Wang *et al;* 2020).

Moreover, the common cold has been treated for decades with inhaled steam to aid the mucus drain more easily. There is laboratory evidence that the cold virus may be sensitive to heat, but the extensive belief in its efficacy has never been put to the test in a controlled clinical trial. Inhaling warm, damp air is

thought to offer relief from symptoms of the common cold. Hot water, hot soup, and tea have been used for centuries for this purpose and have been subject to scientific investigation. However, accidental burns can also be prevented by adopting some precautions. The boiling water of 100 degrees Celsius is not required to be used for inhaling purposes instead use half of its temperature say 45-50 degrees Celsius. Very hot water steam only causes burns otherwise not any danger. Moreover, the most common early radiographic anomaly in burn victims is atelectasis, which naturally clears within a few days. The normal intranasal temperature varies between 31 degrees Celsius at the nares and 36 Degree Celsius at the choanae (Walker *et al;* 1961). This temperature gradient contributes to the conditioning of the inspired air and the recovery of heat and water from the expired air. The moist mucosa in the Oral cavity and at the larynx had enough capacity and capability to absorb the heat and loss of some hot air due to occlusion of the epiglottis and via the esophagus. As a result, the air temperature is similar to the normal body Temperature when the air arrived at the laryngeal Vestibular folds and the air temperature dropped markedly after the air arrived location lower than the larynx. Tissues above the larynx (more specifically above the laryngeal vestibule have good heat retention capabilities, providing protective effects on the lower airway Wang *et al;* 2020). Moreover, Blood circulation can proficiently adjust the heat of local tissues. When local tissues are exposed to the heat, Blood circulation can remove heat and decrease the severity of the local tissue injury. So, the temperature of steam for inhaling, say 45-50 degree Celsius will be bearable without causing any internal damage instead will be beneficial in reducing the viral infection. As the temperature and humidity are the countable factors for viral survival, reproduction, and transmission so its importance also can't be denied. According to Lwoff, it is clear that at 39.5 C the exponential phase of RNA synthesis of the poliovirus was shorter than at 36 C. In another study, the outcome of the in vitro temperature study is presented (Rong *et al;* 2011). The greatest inhibition of rhinovirus occurred at 43°C as the lower cytopathic effect number indicates at this temperature. The shortest duration of treatment that still resulted in effective viral inhibition was 60 minutes. The conditions for the steam treatment arm of the study were therefore set at 1 hour at 43°C. However, if we compare the current situation with influenza and cold viruses' outbreak, previous studies demonstrate that absolute humidity had significant correlations with influenza viral survival and transmission rates. A 25-year study found that humidity was an important determining factor of mortality, and low-humidity levels might cause a large increase in mortality rates, potentially by influenza-related mechanisms, similar to a study carried out in the United States (Barecca *et al;* 2012). Moreover, the transmission of the pandemic influenza virus is efficient under cold, dry conditions. (and the influenza virus survival rate increased markedly following decreasing of absolute humidity.(107) which may be very similar to coronavirus. Therefore, the increase of COVID-19 mortality may also be related to the lower humidity in winter. And the SARS-CoV with which COVID-19 shares a genetic similarity of 79%. In retrospect studies, the outbreak of severe acute respiratory syndrome (SARS) in Guangdong in 2003 gradually washed-out with the warming weather coming, and was ended until July (Wallis *et al;* 2004). Therefore, we assume that the weather conditions might also contribute to the mortality of COVID-19. the higher level of humidity might cause a decrease in the COVID-19 mortality both per 1 unit increase of temperature and absolute humidity was related to the decreased COVID-19 death counts in lag 3 and lag 5, with the greatest decrease both in lag 3 [-7.50% (95% CI: -10.99%, -3.88%) and -11.41% (95% CI: -19.68%, -2.29%)]. For the cumulative effect, no considerable result was observed in this study. However, Steam inhalation should be used continuously because it provides subjective relief of common cold symptoms. One Study conducted in Russian populations shows that excess mortality at low temperatures can largely be prohibited by protection against cold weather (Wang *et al;* 2020). So, we can also control this pandemic COVID-19 disease by binding the virus with these factors of Humidity level and high temperature,

we can also apply these two conditions artificially to arrest the virus.

Prompt implications required

By mid-April 2020, more than 80 percent of countries around the world had imposed strict containment and microbial measures to control the spread of the disease. The economic fallout from the pandemic has been immense, with dire consequences for poverty and welfare, particularly in developing countries. By mid-April 2020, more than 80 percent of countries around the world had imposed strict containment and microbial measures to control the spread of the disease. The economic fallout from the pandemic has been immense, with dire consequences for poverty and welfare, particularly in developing countries. By mid-April 2020, more than 80 percent of countries around the world had imposed strict containment and microbial measures to control the spread of the disease. The economic fallout from the pandemic has been immense, with dire consequences for poverty and welfare, particularly in developing countries. By mid-April 2020, more than 80% of countries around the world have imposed strict containments and lockdowns to control the spread of disease. The economic fallout from this pandemic disease has been immense with the dreadful consequences of poverty and welfare, particularly in developing countries (Loayza *et al;* 2020). The UN's trade and development agency declares the slowdown in the global economy caused by the coronavirus outbreak is likely to cost at least $1 trillion. Nearly half the global workforce, more than 1.6 billion people could lose their livelihoods due to coronavirus restrictions and lockdowns, according to a UN International Laboure Organization report (Wong *et al;* 2020). The lockdowns may be easing, but the fight against the pandemic has not been won up till now. People and economies will remain vulnerable until a vaccine or proper treatment is developed. The challenge in the next few months will be to revive the economy while qualifying new waves of infection and a greater health risk all around the world, there is an urgent effective solution required to be adopted. In infected countries, every person (Loayza *et al;* 2020). Whether he is Healthy or infected, men or Women of all ages has to perform this steam therapy three times per day for few days regularly in this way he or she will be disinfecting itself and this procedure will also prove helpful in reducing further contamination to a healthy community and secondly disinfect the living places, Hospitals, Business places, etc. with the hot temperature. We hope that by adopting the above procedure by every individual in this world this Pandemic disease will be arrested as early as possible and thus the number of cases reported will be reduced to 95% within weeks, not even leading to months. Because every person in this way will be decontaminating himself/herself by making conditions unfavorable for the virus So, this will prove an effective and urgent solution in combating COVID-19 in reducing its survival, replication, and infectivity by controlling the temperature and humidity factor artificially and in the way inhibiting its further transmission to a healthy community. Moreover, it is very important to be published it urgently because further clinical or laboratory investigations are required for checking the effectiveness of steam inhalation and then its fast use for combating COVID-19 and also for other cold-related viruses including influenza viruses, etc.

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