



## Self-Protection of Medical Workers in Traditional Hospitals and Clinics Against SARS-CoV-2 Infection



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**Abstract:** Coronavirus Disease 2019 (COVID-19) is the most prevalent infectious human disease spreading in several parts of the world caused by SARS Coronavirus 2 (SARS-CoV-2). COVID-19 transmission is mainly spreading via the respiratory tract, personal contact, digestive tract and hospital-acquired infections. Health care workers particularly working in clinics practicing traditional medicine need to be in close contact with patients, so they have a higher risk of SARS-CoV-2 infection. In this paper, therefore, the personal-protective measures need to be followed by healthcare workers in traditional medicine clinics during COVID-19 pandemic are emphasized, to enlighten them about self-protection and to improve the safety of such a special group of traditional healers.

**Keywords:** COVID-19, SARS-CoV-2, traditional medicine, health care workers, AYUSH, PPE.

### 1. INTRODUCTION

As of May 17, 2020, 4434653 confirmed cases of Coronavirus Disease 2019 (COVID-19), including 302,169 deaths, caused by novel severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), were reported worldwide [1]. This suspected to originate in December 2019 in Wuhan, Hubei Province, China, with unknown pneumonia-like etiology, acute respiratory illness and later designated as COVID-19 [2, 3]. Coronavirus is an RNA virus that is divided into four genera, out of four, alpha and beta coronavirus are associated with human infections [4]. The virus binds with angiotensin-converting enzyme 2 receptor (ACE2) to enter inside the cell and receptor binding region is similar to SARS coronavirus [5]. SARS-CoV-2 infection was primarily transmitted from person to person through respiratory droplets released when an infected person coughed or sneezed. Viral transmission may also be associated with certain personal and hospital activities like singing, intubation or nebulization. Such activities generate aerosol and may linger in the air for more than 3 hours [6, 7]. SARS-CoV-2 RNA has also been detected in blood and stool, although faecal-oral spread has not been documented or proved yet. Apart from these, the virus may persist for a period of 24 hours on cardboard, up to 72 hours on plastic and stainless steel, 3 hours on airborne droplets and up to four hours on copper alloys [7, 8]. As a result, contamination of inanimate surfaces

may play a key role in transmission [6, 9]. High rates of pre-existing health conditions, limited access to the quality health care facility, and public gatherings pose a challenge in containing the virus. At present, there is no specific treatment available and extensive research is on-going to search a vaccine or drug. However, the desired success may take months to years. Currently, the available chemotherapeutic agents are being repurposed in the management of COVID-19, but the adverse effects of these drugs may increase the difficulties of patients having pre-existing diseases. Meanwhile, the whole world is relying on preventive approaches and looking for alternative treatments available globally like, Ayurveda, Traditional Chinese medicine, Homeopathy, Siddha and Unani. Many of them were used as key remedies during several epidemics in the past. In India, Ayurveda, Homeopathy, Siddha and Unani along with Yoga are combined under a separate ministry considering their heritage and importance among the public. Indian government introduced traditional Indian medicines as preventive and immune booster therapy in the management of SARS-CoV-2 keeping the given anecdotal data and scientific applicability of AYUSH medicines. In India, traditional medicine hospitals and primary healthcare centers are spread all over the country. Many healthcare workers working in these facilities are associated with patient care and/or work in close contact with patients. Due to this, they have a high probability of contacting patients with COVID-19 infection. Therefore, in this article, the knowledge about the COVID-19 self-protection measures needs to be adopted by medical workers associated with traditional medicine hospitals and the health care system, especially in India are emphasized.

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## 2. INFECTIVITY AND TRANSMISSION ROUTE OF SARS-COV-2 AND SUSCEPTIBILITY FACTORS FOR HEALTH CARE WORKERS IN TRADITIONAL MEDICINE HOSPITALS

Infectious diseases are hidden danger or invisible health hazards as they can infect any individual, therefore the personnel protective equipment is necessary to defeat such an unseen enemy. Airborne viral transmissions accounted for certain community outbreaks of SARS [10]. According to the World Health Organization (WHO), one-fifth of the total global diseases are associated with Healthcare workers (HCW) and they are at the highest risk of having the disease [11]. Previous studies reported, approximately 20% of infections occurred in frontline healthcare workers during the SARS outbreak in 2003-2004. In Greater Toronto, the North American epicenter of the SARS outbreak, that number doubled to more than 43%, and two nurses and a physician died. Similarly, on March 10, 2003, at Hong Kong Prince of Wales Hospital, among 138 SARS patients, 69% were hospital workers during the first major outbreak in Hong Kong [12]. In 2003, during the SARS epidemic, most of the medical workers who died with infection had close contact with patients [13, 14]. SARS-CoV-2 outbreak and transmission route are similar to SARS-CoV-1, although this time virus encompassed the entire world and challenging the humanity and health care workers. COVID-19 is mainly transmitted via close contact of person to person, respiratory tract and digestive tract (faecal-oral). Droplets from a sneeze or cough can spread up to 6 meters in an indoor environment and transmit the infection [9]. The mainland of SARS-CoV-2 (China) was reported on February 24, 2020. A total 3387 out of 77,262 patients with COVID-19 (4.4%) were health care workers or others who worked in medical facilities [15]. Unfortunately, 23 health care professionals among these 3387 persons had died from COVID-19 after getting an infection during the practice of medicine in Wuhan and elsewhere in China [16]. Many more cases of SARS-CoV-2 and death of health workers are reported from the other countries. Considering the above consequences and introduction of traditional medicine health care workers in routine diagnosis and treatment procedures will lead to exposure of the same to unscreened people to a large extent. Moreover, in close screening and examinations, the health care workers used to be very close to the patient hence, facing a higher risk of infection. Besides, aerosols will be produced if the patients cough or sneeze, which also increases the risk of infection for traditional medicine hospital and healthcare workers.

## 3. MAINTENANCE OF PATIENT POPULATION IN TRADITIONAL MEDICINE HOSPITALS

### 3.1. Patient Registration

As a precautionary measure of the spread of SARS-CoV-2, online registration may be initiated to avoid uninvited patient gathering and risk exposure of health workers. Only a limited number of patients should be allowed for online registration per day according to the facility at the premises to limit the gathering of the patients. By online registration, there may be less contact of patients and hospital staff like receptionist/registration panel, *etc.*

### 3.2. Screening of Patients

In any healthcare system, patient screening and close examination can transmit the infection from patient to healthcare workers or physicians especially when the disease is airborne or contact transmission. Thus, during the patient screening, personnel protective gear must be adopted. Asymptomatic cases associated with COVID-19 are highly dangerous for community and healthcare workers. In SARS-CoV-2 epidemic prevention and control measures, screening of only body temperature may miss a large number of COVID-19 patients without fever. Sometimes, the patient may take the antipyretic drugs and in such cases, temperature cannot be measured. Therefore, during the process of online registration, epidemiological history, including contact/travel and exposure to suspected epidemic places of disease, should be obtained for possible identification of suspected COVID-19 patients prior to hospital entry followed by mandatory body temperature measurement.

### 3.3. Creation of Digital Facility at the Premises

The premises should be digitalized; there should be minimum use of paper as possible like prescription, test reports, *etc.* The e-prescription should be generated by the physician on a server which can be accessed by a pharmacy with patient's ID so that the patient can take medicine without using any paper prescription. The test report of the patient should be shared with the server and provided to the patient *via* email of any other form of digital media. Likewise, there should be digital use of all documents in spite of using papers.

### 3.4. Use of Telemedicine

Telemedicine allows health care professionals to evaluate, diagnose and treat patients at a distance using telecommunications technology. The approach has been through a striking evolution in the last decade and it is becoming an increasingly important part of the health care systems. AYUSH ministry under the government of India has already initiated telemedicine practices for the public to treat any other ailments or for psychological counseling during COVID-19 pandemic.

### 3.5. Central Air-conditioning at Outpatient/Inpatient Departments (OPD/IPD) Area

The air-conditioning ventilation system is a potential source of aerosol transmission, which increases the microorganisms in midstream-downstream air, thereby raising the concentration of microorganisms in the indoor environment. Previous studies on the air-conditioned wards suggest that the particle size distribution of bacterial aerosols is related to the season, grade 3-5 in summer and grade 1-3 in winter [17]. Thus, the air-conditioning system with a built-in purification function should be installed in the hospitals. The coarse filter gauze of fresh air unit should be cleaned every 2 days, and replace the coarse filter every 1-2 months. The mid-effect filter should be cleaned every week, should be replaced every 3 months, and the sub-high-effect filter should be changed every year [18]. If the air-conditioning system is without built-in purification function, it can be

sterilized through ultraviolet germicidal irradiation (Ultraviolet-C, 200-300nm) or electrostatic adsorption or by spray-type air sterilization to avoid the spread of infections. Preventing the use of a central air-conditioning system in SARS-CoV-2 patient's wards during such pandemic will be vital.

### 3.6. Ventilation of Outpatient Department (OPD) Area and Consulting Room

It is recommended to strengthen the ventilation of the OPD area and consulting room in traditional medicine hospitals and health care setup, including natural ventilation and mechanical ventilation, to keep indoor air circulation. One patient should be treated by one doctor in a room to avoid cross-infection among the patients. Throughout the consultation, physician and the patients should maintain a safe distance; avoid unnecessary conversation with the preference of maintaining electronic medical records instead of paperwork. The consulting room should have an auto door closer and patients should be advised to avoid touching the door or doorknobs. Both doctor and patient should wear the mask and use hand sanitizers before and after the checkup. Patients must enter through a one-way entrance, and then leave from a specified door. Once the patient leaves, the surface and any objects which might have come in contact with him, such as seat, table, door handle and medical devices need to be disinfected promptly. It can be wiped and disinfected with chlorine (1000 mg/L)/Lysol (7%) disinfectant at least twice a day as a routine protocol, while additionally disinfected immediately. The OPD area and consulting room should be equipped with an automatic dispenser of hand sanitizer, dustbin with lid open-able via single foot touch.

## 4. RISK ASSOCIATED WITH HEALTHWORKERS AND PROTECTIVE MEASURES

Based on the work and patient exposure, different levels of protective measures should be taken. Health workers in direct contact of patients like nurses, ward boy, technician and doctors have a high risk of exposure, so they are recommended to wear work clothes, isolation gowns, medical-surgical masks/protective masks, work caps, face shields/protective glasses and gloves. Physicians, nurses and technicians involved in high-risk operations like direct contact with blood, body fluids and aerosols and collection of specimens are needed to wear (disposable) medical protective clothing or isolation gowns, N95 masks or higher-grade ones, face shields/protective glasses and double gloves. The gown should be waterproof to avoid the exposure of body fluids. Health workers having indirect contact with patients may be referred as low-risk category staff, so it is recommended to wear work clothes or isolation gowns, medical-surgical masks and work caps, and follow the hand hygiene practice.

## 5. AYUSH HEALTH CARE SETUP

AYUSH system is most popular in India and part of the national health program, but hospitals and clinics are not as much advanced and developed in comparison to western medicine hospital and clinics. There is a widespread use of traditional medicine across developing countries (across

Asia, Africa and Latin America) with rapidly emerging markets in North America and Europe [19, 20]. However, despite increasing national and international attention, the formal health systems, particularly in resource-poor settings, are yet to harness its true potential [21]. Apart from this, the traditional medicine health care workers are not familiar with dealing such infectious diseases, which may pose a major risk to healthcare workers. Despite this, the implementation of proper hand hygiene is low in medical workers, and there are many reasons, such as lack of proper hand hygiene knowledge, inconvenient location of hand sinks, insufficient number of medical workers or busywork, and insufficient attention to guiding principles [22]. Therefore it is highly recommended to mandate the usage of face mask, gloves, face shields and other protective items every time health care workers come in contact with the patients, especially during patient examinations. Health care workers should be given hands-on training experience on how to use personnel protective equipment and perform hand hygiene as preventive measures in preventing the spread of COVID-19.

## 6. HAND HYGIENE AND DISINFECTION

Regular and precise hand hygiene is extremely important to prevent the spread of the COVID-19 virus. All healthcare facilities should have regular programmes aimed at promoting best hand hygiene practices and ensuring the availability of the necessary infrastructure (equipment and supplies). Performing hand hygiene at the right time, using the right technique with either alcohol-based hand rub or soap and water is essential. Hand hygiene is a priority in five situations as per WHO, namely (1) before touching a patient, (2) before clean/aseptic procedures, (3) after body fluid exposure/risk, (4) after touching a patient, and (5) after touching patient surroundings. These instructions should be mandatorily adopted and practised at all the AYUSH health care facilities [23]. In addition to this, patients also motivated for hand hygiene/disinfect before entering to hospital as well as doctor's cabin for safety.

## 7. DISINFECTION OF CLINICAL APPLIANCES AND EQUIPMENT

Disinfection of clinical appliances and equipment is a vital element of medical care, since patients come in contact with clinical equipment, surgical tools, syringes and bandages all the time. To ensure the safety of patients and medical practitioners, medical equipment must be cleaned and sterilized regularly. Thorough and effective cleaning of equipment and appliances is necessary to avoid the possibility of disease spreading from patient to patient and it also reduces bio-burden. Food and drug administration (FDA) cleared and marketed formulations consisting of  $\geq 2.4\%$  glutaraldehyde, 0.55% ortho-phthalaldehyde (OPA), 0.95% glutaraldehyde with 1.64% phenol/phenate, 7.35% hydrogen peroxide with 0.23% peracetic acid, 1.0% hydrogen peroxide with 0.08% peracetic acid, and 7.5% hydrogen peroxide, which can be used as processing and cleaning of reusable medical devices cum equipment's. Disinfectants may be sprayed or used to wipe clinical contact surfaces. The surfaces should be sprayed, then wiped, or they should be wiped with disinfectant-soaked towelettes to remove debris. After

the cleaning step, the surface should be sprayed again, or wiped with disinfectant towelettes and allowed to remain wet for the time indicated on the product label. A fresh wipe should be used for each of the cleaning and disinfecting steps [24]. In the current COVID-19 situation, the management of clinical contact surfaces remains an important aspect of an infection control program for all healthcare settings.

## 8. DISINFECTION OF EXTERNAL SUPPLIES

External supplies may be a source of COVID-19 infection; hence these should be disinfected before entry into the clinics. The disinfection can be carried out in a designated place in the hospital premises and after a sufficient period, such supplies should be moved to the actual place for regular use.

## 9. MEDICAL WASTE IN THE CLINIC

The medical waste in the hospital and clinics must be cleared promptly and then dustbin should be closed. Medical waste should be discarded as per the waste category as per colour coding. Dustbins must use the colour-coded bags to avoid exposure during the decanting. The multilingual instructions to put the garbage in designated dustbin should be placed near to dustbin. Once the waste is discarded, inside and outside surfaces of the dustbins must be disinfected with chlorine (1%-0.5 %) containing disinfectant every day.

## CONCLUSION

Healthcare workers are front line warriors, who are always ready to save humanity by putting their lives in danger. Front line warrior's health importance increases even more when a brutal pandemic like SARS-CoV-2 emerges. High risk of contact to SARS-CoV-2 infection in healthcare facility is associated due to the nature of their jobs. Thus, vigorous protective measures are needed to be adopted to protect themselves. The strategies discussed above in the article will be of high value for traditional health care units to ensure safety of their staff, who are vital components of their organizations. The traditional health care hospitals most importantly should undertake stringent and appropriate hospital infection-control measures to ensure the safety of health care workers and patients.

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## CONFLICT OF INTEREST

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