

## Preventive Measures for Health Professionals in COVID-19

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### ABSTRACT

#### BACKGROUND

COVID-19 or coronavirus disease 2019 is affecting all inhabitants on the earth and most affected section of the society which is also a crucial aspect of the mitigation measures is health care professionals.

#### SUMMARY

COVID-19 or coronavirus disease 2019 is raging across the world with increasing number of infected cases and associated case fatalities. Health care professionals are among worst hit section and several of them laid their life in the line of duty of COVID-19 mitigation. It is therefore important to safeguard them through this pandemic and ensure proper care of them is taken.

#### CONCLUSION

Best practices must be followed in order to ensure the safety of the front-line workers such as doctors and allied health care givers. More study can be done to broaden the base of available empirical data of factors affecting the safety of them.

**KEYWORDS:** COVID-19, PANDMEIC, HEALTH CARE WORKERS, PSYCHOLOGICAL IMPACT, PROPHYLACTICS, PPE.

### INTRODUCTION

The severe acute respiratory syndrome (SARS) has arrived with its new form SARS-COV2. It caused by novel coronavirus which is the latest entrant in coronaviridae family. World Health Organization (WHO) named the disease caused by it as COVID-19. (1) Coronavirus disease 2019 full form of the COVID-19 is named after crown shaped virus which was found such during research. As of January 13, 2021, 91,700,280 infection among people have been reported from all across the globe and from more than 200 countries and various territories and 1,964,764 case fatalities have been

reported which is inching towards unfortunate milestone of

two million(2). Case fatality rate which is the ratio of number of deaths to number of cases is around 2 percent. United States of America, India, Brazil and Russian federation are the top countries accounting for considerable amount of cases(3). Comorbidities are the single main factor deciding the severity of the virus effect(4). Though various authorized agencies and governments are looking for solution but till now there isn't one. Various measures have been undertaken to contain the viral spread but the figure suggest the exponential and rapid pace of spread of the virus. Health care professionals are at

extremely high risk of contracting the COVID-19 infection and needs to protect as already the number of them are not sufficient to deal with the medical disaster like COVID-19 pandemic(5). Among certain factors diet is also a deciding factor whether a person will contract the infection or not or the severity of the above-mentioned disease. The huge case number requires huge infrastructure to accommodate the persons affected. But the health infrastructure is overwhelmed by the pandemic. Therefore, efforts are being made to ensure that the person not get contracted the virus at first stage only. There are various methods involving the preventive measure including non-pharmacological interventions (NPI) like lockdowns, physical distancing etc.(6). Dietary habits are also crucial in preventive measure. In USA the more obese and people having type 2 diabetes have greater chance of not only contracting the virus faster than others but also of need of high-end care like intensive care and oxygen support. Proper diet will ensure from early stage that you are not affected by any kind of preventable viruses. For those who have comorbidities curated diet can be adoption along with the medical interventions. Some foods containing vital minerals, vitamins and nutrients should be adequately consume which is found to be strengthening the innate immune response. Not only physical but mental stress is on peak and needs to address as soon as possible(7). Judicious use of diet is also a key factor in deciding the overall physical and mental state. In this paper we have taken stalk and birds eye view of the diet and its part in immunity boosting during COVID-19 pandemic.

### **HEALTH CARE PROFESSIONALS AND ASSOCIATED RISKS**

COVID-19 has been proving a major challenge in terms of medical calamity that has never been experienced in almost past hundred year. Serious challenge is being

posed by coronavirus disease 2019 or covid-19 before humanity as a whole. It is necessary to contain the viral spread as soon as possible so as to avoid the further menace caused by the disease outbreak. The trace, test and treat strategy has been so far proven to be effective in mitigation. The backbone of the above-mentioned strategy is the treatment part which requires COVID-19 care facilities or hospitals and health care professionals. Without it, the strategy would not prove to be beneficial(8). But the health care professionals are the most vulnerable section of the society which are prone to infection of COVID-19. They are the front-line workers dealing with the containment of COVID-19. The potential exposure to the health care personnel's is huge chance. Various travel and community related exposure can also be counted as potential chance of infection. Often and extensive close proximity contact with the vulnerable individuals make the health care professionals the receiver as well as transmitter to other people in a given health care infrastructure settings. The cost to benefit ratio of doing contact tracing in suspected health care professionals depends upon their surrounding of the world setting. Minimal to no community transmission area work setting and environment would have less chance to develop the infection than the high community transmission setting areas. Also, it would be less possible to trace the health care professional as there can be already shortage of the personnel's around there.

### **NUTRITION IN DIET AND ITS CONNECTION TO COVID-19**

Novel coronavirus or SARS-COV-2 is the modified and mutated strain of coronaviridae family which have human coronaviruses. COVID-19 is caused by the novel coronavirus which was declared pandemic in mid-march by World Health Organization (WHO). Since then, it is

raging across the world. It mainly affects the respiratory system which consists of lungs and others organs. It is found out that in many cases the underlying comorbidity is a factor deciding the case fatality rate (CFR) among patients. Patients with diabetes, hypertension, renal failure, heart condition have more chance of showing the severe symptoms which is not shown in either cases. The recovery rate in non-comorbid old aged patients is quite high as compared to comorbid old aged patients. But in some cases, even the patient's age is less and it has severe underlying condition then the complications arise needs more complex treatment. Not only normal population but health care workers are badly hit by the pandemic. They are the first responders and have to work in close proximity of the infected patient. Many doctors already laid their lives in the line of clinical duty after contracting the COVID-19 while treating other patients(9). Also, many allied health care professionals were died due to COVID-19 complications. According to International Nurses Council, more nurses has died due to COVID-19 complications and clinical outcomes associated with it than during First World War(10). Chances of increase in CFR is high in such cases. This can be avoided with various non-coercive and effective methods and measures and safety health care professional can ensured. Dietary component is one of the key elements along with demography, geography, socioeconomic status which is highly neglected. Disease prevention is always better than disease treatment. But the prevention part is almost neglected, resulting in increased burden on already crumbling health care sector. The trend of diet containing high saturated fats, high number of sugars is extremely bad in all the cases. This is also called western diet as it is popular and started among western countries. The high rate of obesity in these countries is attributable to this type of diet.

Also, low intake of fibers, unsaturated fats etc. is also contributing to the obesity and type 2 diabetes mellitus. Fatty acids of saturated products lead to inflammation and such high saturated fat diet inhibits the innate immune response, which is also a deciding factor in patients testing positive. Patients having these diets have high susceptibility of contracting the COVID-19. More importantly it hinders with cell activity and induces the oxidative stress resulting the deterioration of the of the immunity power which actually fights with the virus. The healthcare professionals can be advised to modify the diet so that accordingly they are stronger from within and functioning of the body remains smooth. The T cell response in influenza like illnesses is found to be weakened in mice that was fed with the diet containing high saturated fat. T cell basically remembers the virus strain of the same family and develops the fighting response against the same. If this response is low then the hospitalization chances of the concern patients are increased. Otherwise, mere primary care would have been sufficed. Intake of unhealthy diet in certain underprivileged group created high risk of widespread distribution of virus. It also found out that the patients with severe COVID-19 symptoms have low count of T cells. Also malnourishment is equally fatal as high food intake and can be very fatal if the virus is contracted by such persons or group as whole(11).

Food is not only a medium or source to fulfil the urge aroused due to hunger it is a whole some source to complete our nutrition quota which in turn is essential for maintaining the day-to-day function of the body. This fact is almost neglected as the diversity in food and diet is often neglected. Monotonous diet is sometimes due to economic compulsions. The current pandemic situation has already made sectors and health care professionals stressed and overburdened and they do not have enough time to curate the diet and

often eat what is available quickly mostly of it is not healthy. Government run programs often serve only coarse grains and cereals. Which is insufficient in fulfilling the diverse diet criteria. Such diet in COVID-19 situation can be very fatal as necessary protection will not be ensured due to incomplete diet. Nutrition and health are deeply interconnected. One cannot ensure good health without nutrition. Diet also can be employed to manage the disease attack. More study is definitely needed to find out the relation between diet and recovery rate. Personalized nutritional plan according to the patient's overall condition along with pharmacological intervention will be helpful in not only severe patients but mild patients too. A proper plan with contraindications, comorbidity effects will help in precise and targeted treatment of the sufferer. Proper exercise and treatment to reduce the comorbid condition among health care professionals(12).

### **SUPPLEMENTARY FOODS IN DIET THAT CAN BOOST IMMUNITY**

Health care professionals are the backbone of the whole mitigation measure that is being employed for the containment of the COVID-19. They cannot afford and is also not feasible to undergo curative part as there are various attached consequences that is not good for them. Also, there is already lack of manpower in health care sector and infrastructure is already stressed. It is therefore important to prevent the disease from happening at first place so that all other attached consequences can be avoided and the already stressed manpower can be effectively utilized. There are genuine supplementary dietary components which are really helpful in boosting our immunity. These supplements are backed proper study conducted on them and list of benefits, contraindications, dosages, time are found. This can be helpful self-medication that can lessen the burden on

already ailing health sector and can address the manpower deficit. These include vitamin c, vitamin d, zinc etc. which are proven to be anti-viral and anti-bacterial properties. Vitamin c foods like citrus fruits lemon, goose berry fruits have immense amount of vitamin c which can reduce the oxidative stress due to its anti-oxidants properties(13). Although Vitamin c should not be used as management tool of COVID-19. It is more of a preventive care than curative care. Proper study needs to be done to ensure the effectiveness with empirical study. Vitamin d is widely present in many food substances and also good amount of sunlight exposure in early period of daytime can stimulate the production. Sunlight is said to be mood enhancer which can cure mild sadness and can fill you with joy. Vitamin d also found to be inducing anti-inflammatory properties and boosting innate immune response by T cells. Vitamin d food supplements include various types of fishes include salmon, sardines, cod liver oil, canned tuna, egg yolks, mushrooms, cow's milk, soy milk, orange juice etc. Though a proper study is needed to establish a concrete relation among these foods and its usage. Zinc is another supplement that is cherished as a treatment option. Effects on suffering patient is under reported and needs more research but as our body demands minerals to function effectively in day-to-day life and to ward off the virus zinc can be consumed in safer quantity. Food supplements containing zinc are meat, legumes, nuts, dairy, eggs etc. The amount of zinc should be consumed daily stands at around 9-10 mg per day. Maintaining these minimum levels can easily keep us fit and healthy along with some physical exercises. Appointment of dietician and another competent authority can be done from hospital or governmental authority can be done to ensure safe and healthy intake of diet has been consumed by the health care professionals(14).

## PSYCHOLOGICAL IMPACT ON HEALTH CARE PROFESSIONALS.

Apart from physical stress that is already experienced by the healthcare professional fraternity, there is a hidden mental toll that is being imposed by the pandemic on not only people but on health care professionals too. They are going through severe mental trauma as they have to deal with daily COVID-19 infection cases and deaths. Patients with severe comorbidity are producing fatal clinical outcomes and sometimes this has huge impact on operating personnel. Also, there is constant chance of being infected and transmitting it to family members and loved ones which they do not want to but have to live in that fear. Several doctors and other allied health care professionals have laid their lives in front of their colleagues and this impacts their fellows deeply. Therefore, it is necessary to establish a vent that is implemented to take out the anxiety and depression level time to time from them. Designated community medicine officer or mental health expert can establish contact with them and understand their emotions thereby providing them some relief on duty. Less or no contact is sometimes associated with depression as there are no medium and people to speak with about their ongoing troubles(15).

## PROTOCOLS OF USING PPE KIT

There should be strict adherence to the protocols laid down by competent agencies in all parts of the world. PPE kit is not an option and is mandatory for patients as well as personnel coming in direct contact with infected patients. However, the equipment's and components of the PPE kit may vary as patients needed to be treated and therefore cannot be covered from head to toe. But proper PPE should be provided so that it can be treated safely. But health care professionals need to wear PPE gears from head to toe as they are at higher risk of contracting virus. Various types of PPE kits are available among

which most suitable should be chosen according to disease. As COVID-19 is highly infectious, it needs a lot of protection equipment to cover oneself from infection. PPE cannot be used intermittently and should be used from starting of the duty till the end of the duty. Wearing and removing guidelines are extremely necessary to be followed as these are the intermediate and most vulnerable stages. If you wear your PPE kit wrong, then there will be a false sense of security and chances of getting contracted by infection is higher. Also, size does matter in PPE kit as there are different physiological types of health workers. Selecting and wearing correct size PPE kit can decide the safety from virus. It is quite difficult to wear and check oneself whether they have worn it correctly, authorities can group two individuals to check on others whether they have worn it correctly or not. Best practices available in the world should be followed after analyzing it in local context. If there is shortage of PPE kit and authorities are planning to reuse the kits then strict guidelines and proper sterilization method should be used in order to overcome the PPE shortage problems(16).

Although there are some challenges in PPE kits such as proper size and optimization. Custom made PPE kits according to the health personnel should be on top priority as one size fits all solution will only increase the vulnerability. Optimization of PPE kits so that it gives minimum restrictions and maximum possible comfort to the person wearing it so that the person's long working hours are bearable and efficient.

## BENEFITS OF USING PPE KIT

The usage of the PPE kit is very well understood during the spread of the virus Ebola. It benefited the personnel due to the same reasons; the kit is being used now in many countries to deal with coronavirus patients. Here are some of the very basic



reasons due to which making use of the PPE Kit is extremely important during this pandemic situation.

Health professionals such as doctors and nurses are in direct contact with the patients of coronavirus and hence, they are at maximum risk. Also allied and ancillary health care workers due to their close proximity are at higher risk of not only getting the virus infection but also of transmitting to others including family members. The use of general masks and gloves used by the general public is not enough in this case and hence making use of the PPE kit is the ultimate thing to be used(17). Many studies on Covid pandemic were reported from this region (19-21). Informative studies on prevention of spread of infection were reported (22-25). Khatod et. al.(26) and Dhole et. al. (27) discussed on methods of disinfection in dentistry. Late et. al. elaborated on protocol for handling and disposal of the dead bodies in Covid-19 (28).

### CONCLUSION

It seen that diet is the single most important thing that we can control and manage. Proper management of diet can be very helpful. Almost every disease emerges from food or food related mismanagement. Immune system is crucial aspect in building the immune system to ward off the infection and prevent the body from any disease. Further in persons having undergoing some treatment or medical interventions such as of COVID-19, study needs to establish the relation between patient's health status and diet. Usage of vitamin c, vitamin d, zinc which are full of anti-oxidants and substances that stimulates and strengthen innate immune response should be studied more. More research is needed to be done in ensuring the more judicious use of diet as managing tool. Using it as a preventive tool is also a good way in ensuring the disease-free life. Infodemic menace can be tackled from higher level to lower level

with the help of various agencies and non-governmental organization. Psychological pressure must not be ignoring and there should be no delay in appointing competent personal to personally deal with each and every health care professional and worker to ensure safe release of their peak emotions. After all health is wealth where everyone can have a life experience free from all illnesses. Of course, more comprehensive research and analysis is needed. Diet as a force multiplier will prove not only in lowering the infection numbers but also give some relief for health infrastructure which is severely crunched.

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