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A General Study on Corona Virus and Highlighting the Rehabilitation of the Respiratory System in Elderly Patients Infected with Corona Virus in Thi-Qar

Batool Khalid jarad [1], Zahra'a Ali Naser [2], Bador jassim nahi [3], Dhuha Hasan Hamadi [4], Wafaa abdul kadhim issa [5], Zain Al Abdeen Ali saleh [6], Lara Allawi Muhammad Maan [7], Hawraa Shakier Mahmood [8], Ayat Kareem jassim Mohammed [9], Waleed Nassar Abd [10]

[1]Laboratory of Al-Amal Hospital in Nasiryah , Pathology Nasiriyah/ Iraq.
[2]Al-Rahman Hospital laboratory in Nasiriyah , Pathology, Thi Qar/Iraq
[3]Al-Musawi laboratory in Dhi Qar, Pathology , Thi Qar/Iraq
[4]Shatt al-Arab laboratory in Nasiriyah, Pathology , Thi Qar/Iraq
[5]Al-Azhar laboratory in Nasiriyah, Pathology, Nasiriyah/ Iraq.
[6]Rahman laboratory In Nasiriyah, Pathology , Thi Qar/Iraq
[7]Al-dalal Lab in Dhi Qar, biology, Thi Qar/Iraq
[8]Rawan Laboratory In Dhi Qar, pathology , Thi Qar/Iraq
[9]Laboratory of Al-Amal Hospital in Nasiriyah, Pathology , Nasiriyah/ Iraq
[10]Al-dalal Lab in Dhi Qar, Pathology, Thi Qar/Ira

ABSTRACT

Coronavirus (COVID-19) is a respiratory virus that emerged at the end of 2019 in Wuhan, Hubei Province, China. The virus has rapidly spread worldwide and has been classified by the World Health Organization as a global pandemic. Common symptoms of coronavirus infection include fever, dry cough, and difficulty breathing. Some may experience sore throat, fatigue, muscle aches, and loss of sense of smell or taste. Symptoms can appear within 2-14 days of exposure to the virus.

Prevention of Coronavirus includes following important health measures such as washing hands regularly for at least 20 seconds with soap and water, avoiding touching the face with unsanitized hands, wearing protective masks in public places, practicing social distancing by staying away from crowds, and regularly cleaning and sterilizing contact surfaces.

There is no specific treatment for Coronavirus yet. Symptoms are treated individually, such as taking medications to reduce fever, relieve pain, and going to rest and recuperation. If symptoms worsen or difficulty breathing occurs, you should contact the competent medical staff to obtain the necessary medical assistance.

Effective coronavirus vaccines have been developed and widely distributed. It is recommended to take the vaccine for effective protection against the virus and reduce the chances of developing serious symptoms.

It is recommended to follow official and reliable sources to obtain the latest developments and guidance regarding the Coronavirus, such as The World Health Organization and the country's health organization are working to address the situation effectively.

KEYWORDS: evolution of the coronaviruses, types of coronavirus , causes of infection , symptoms , diagnosis ,prevention.

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INTRODUCTION

The current global pandemic is a result of the emergence of a new coronavirus, known as the novel coronavirus disease (2019-nCoV) or severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2). This virus, commonly referred to as COVID-19, initially The outbreak of the COVID-19 virus took place in

Wuhan, a city located in Hubei , China . Since then Since its initial appearance, the virus has quickly disseminated. across the globe,s causing widespread infection and illness. Unfortunately, the response of many countries to this outbreak was delayed, leading to a significant increase in The number of worldwide cases has been increasing significantly. The SARS-CoV-2 virus has undergone genomic analysis. virus has revealed its genetic similarity Additional bat coronaviruses have had genomic analysis performed on them , including SARS-CoV-1 respiratory syndrome, MERS-CoV , indicating that bats likely serve It is considered the primary source of the virus. However, the source identified for the virus In addition to the methods From its spread among humans through indirect means are still being investigated[1].

Take it from the 5th of July in the year 2020, there are currently There is no reliable antivirus drugs or vaccines specifically designed to treat COVID-19. However, various organizations worldwide are actively Studies are seeking to develop a vaccine to combat the new Corona virus Promising candidates are under development, but as of July 2020, none have been officially approved. In terms of treatment optionsdrugs like dexamethasone and remdesivir (GS-5734) are, Undergoing clinical trials in the final stages to evaluate their efficacy, but they have not yet received approval for use in any country. It has been confirmed that Spread of Coronavirus (COVID-19) virus The primary cause of transmission is through person-to-person interactions [2].

The maximum decrease in viral load occurs through the appearance of symptoms, however, there are people who carry the virus without symptoms, who are transmitters of the infection [3].

To prevent coronavirus, it is recommended to follow public safety guidelines such as: E.g., washing hands regularly, wearing masks in public places, maintaining social distance and avoiding direct contact with infected people. There are also vaccines to protect people from disease.

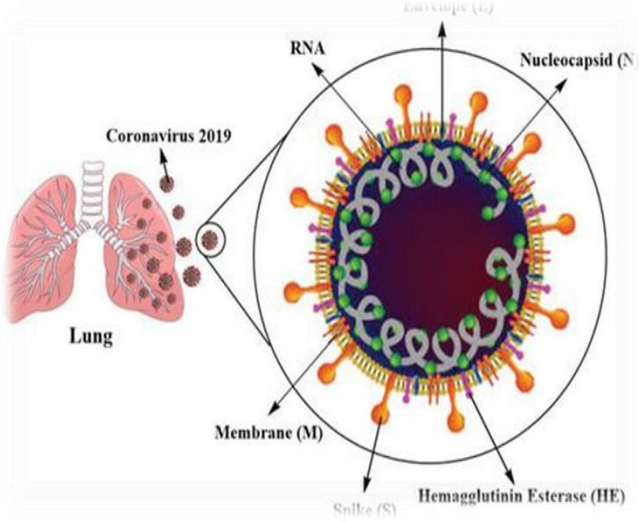

Fig (1)

Evolution of the Coronaviruses

The recent outbreak of coronavirus 2019 now called as COVID-19), which can leave them with serious respiratory illnesses , poses a possible danger to human health and attracted Following the emergence of severe acute respiratory sickness syndrome, there was great attention globally. In 2003 . Pandemic of (SARS) .

The Middle East Respiratory Syndrome (MERS) first emerged in 2012 and was later identified Wuhan, the Chinese province of Hubei, on December 29, 2019 [4].

In China, the first cases of the disease were confirmed on January 13 and 16 in Thailand and Japan, respectively. On January 23, Wuhan and other nearby cities went into lockdown to prevent the virus from spreading outside of China.

Since then, the disease- causing virus has expanded to various regions of Asia, Europe, North America, South America, Africa, and Oceania. In March of this year, it became the 2019–2020 worldwide Covid-19 pandemic [5].

The coronavirus (COVID-19) has evolved since it emerged in early 2019. New virus strains have been discovered and several mutated strains have emerged. One of the most important changes was the emergence of the ?Delta? strain, a mutant strain that was more contagious than previous strains. Other strains such as Alpha, Beta, Gamma, Omicron and others have also been discovered. Viruses evolve naturally over time and are subject to mutations and changes in their genes. These mutations can affect the properties of the virus, such as its transmissibility or the effectiveness of vaccines against it. Therefore, scientists and global health centers constantly monitor coronavirus mutations . It is important to understand that natural mutations of the virus do not necessarily mean an increase in its risk. However, we must stay abreast of the latest developments and follow official health guidelines to limit and prevent the spread of the virus.

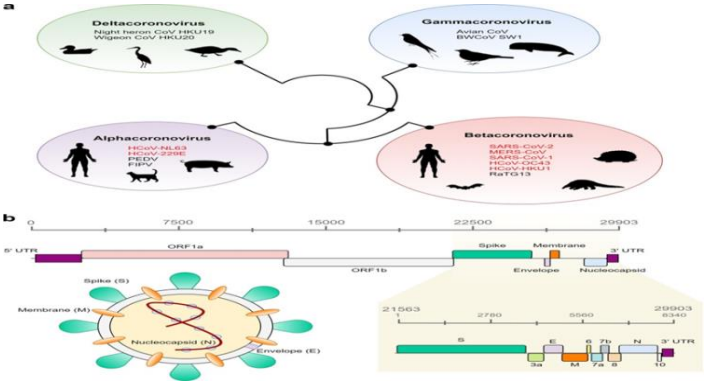

Fig. (2)

Coronaviruses also often recombine. When animals carrying different coronaviruses come into close contact and exchange viruses, recombination between different strains can occur, leading to diversification.

Types of corona virus

Coronaviruses derive their name from the surface-mounted spikes that have the shape of a crown. They are categorized into

four primary subgroups: Alpha, Beta, Gamma, and Delta. The identification of human coronaviruses dates back to the mid-1960s. Currently, there are seven known types of coronaviruses that have the potential to infect humans.

Common human coronaviruses

1-OC43 "beta coronavirus"

2-NL63 "alpha coronavirus"

3-HKU1 "beta coronavirus"

4-229E "alpha coronavirus"

Other human coronaviruses

5-SARS-CoV is a beta coronavirus that causes severe acute respiratory syndrome, abbreviated as SARS.

6-The coronavirus known as 2019 Novel Coronavirus (2019-nCoV) first appeared in 2019. Human coronaviruses like 229E, NL63, OC43, and HKU1 are frequently contracted by people all around the world .

7-MERS-CoV, also known as Middle East Respiratory Syndrome Beta-Coronavirus or MERS, is another type of coronavirus.

Occasionally, coronaviruses that originally infect animals can undergo changes and lead to illness in humans, thereby giving rise to new human coronaviruses. The three most recent instances of this occurrence are 2019-nCoV, SARS-CoV, and MERS-CoV.

The causes of infection with the Corona virus

1-Mass gatherings.

2-Close contact with any infected person who has symptoms.

3-Traveling to affected areas.

4-Contact with animals that carry this disease.

5-Touching surfaces that are contaminated and transmit the disease.

6-Being in contact with people infected with Covid _19.

Factors that increase the incidence of this disease

Risk factors encompass a range of factors that elevate the probability of contracting an illness or infection. In relation to infection and specifically COVID-19, the primary factors attributed to transmission are as follows:

Older people

SARS-CoV-2 can infect people of all ages, but occurs much less frequently in people under 14 years of age and is often asymptomatic in young people.

As people age, the number of COVID-19 cases increases, making age a risk factor for the disease. In society, middle-aged people are usually infected, but older people usually become infected through coughing and sneezing from other infected family members and friends or through hospitalization . Mortality is higher in older people [6].

sex

Men are more susceptible to infection with the SARS-CoV-2 virus, so male gender constitutes a risk factor for infection with the COV-ID-19 virus. Since this disease is transmitted within the community, men are more likely to be away from home and more present in the community due to circumstances. Work, there seems to be a greater risk of infection. Behavioral differences between males and females, especially with regard to vital advice, as well as compliance with social distancing, are a problem that cannot be ignored[7].

Cardiovascular diseases

Patients with cardiovascular disease are at higher risk of contracting the Corona pandemic. Expression of ACE2 may be related to the cause. In vascular myocytes and cellular fibers. The appearance of the microbe in the cells of the cardiovascular system can harm them and prompt their intervention. Congestion of mononuclear cells in cardiac cells, and congestion will aggravate the infection [8].

Likewise, people with diabetes and high blood pressure are at increased risk of developing infections. Moreover, certain causes may increase the likelihood of contracting coronavirus disease by endangering the functions of the respiratory system and heart cells, impairing blood circulation, impeding the elimination of metabolic wastes, and weakening the immune system. Prominent factors in this regard include chronic obstructive pulmonary disease (COPD), chronic kidney disease, malnutrition, and immunodeficiency

Environmental impact of COVID-19

The main causes of transmission of the Covid-19 virus are gatherings and close contact. The WHO has recommended a social distance (1.80 meters) at meetings or at work.

including curfew to combat Covid-19. Completely closing and sealing hot spots reduces unnecessary movement. Furthermore, the country's complete lockdown with social distancing also helped break the chain of transmission of COVID-19.

It has been concluded that the curfew is the most effective measure to reduce the transmission of the Covid-19 virus by minimizing interpersonal interactions[9].

symptoms of COVID-19

Two main Contagious states can happen in Infected individual with covid-19: an asymptomatic condition and a symptomatic condition . The symptomatic condition can development to acute respiratory syndrome(ARDS), so the Contagion can Guide to Multi-organ dysfunction,which can be lethal to the patient. An asymptomatic patient has no signs of illness due to increase immunity capability.

However, it can still transmit the infection to others.This situation is extremely unsafe for the community and the virus's spread.It is not possible to recognize an asymptomatic patient without administering an RT-PCR test.Dealing with a substantial number of people can make this task difficult. The large government institution's size limits its ability to determine the level of community transmission[10].

Symptomatic cases can range in their severity, with most individuals experiencing mild symptoms like fever, cough, sore throat, headache, and muscle pain.Critical symptoms like ARDS or organ failure can occur in severe cases (according to the Lines Interim Clinical Guide for Patient Management).

An approved categorization of coronavirus (COVID-19) diseases, 2020.ARDS (Acute Respiratory Distress Syndrome) is a condition of respiratory failure primarily marked by lung inflammation, particularly affecting the alveoli.

"Which promotes gas exchange, regulates stable pulmonary circulation, and balances surface tension."In COVID-19, the excessive increase in inflammatory cytokines, monocytes, neutrophils, etc. can cause vasodilation [11].

"These symptoms can manifest as difficulty breathing, increased respiratory rate, and cyanosis (bluish skin discoloration)"

(Interim clinical guidelines for the treatment of patients with confirmed coronavirus disease (COVID-19), 2020)

Patients with ARDS are prescribed placement on mechanical ventilators to help patients breathe, resulting in an exponential increase in the number of conditions There has been a % increase in the need for this type of ventilator.

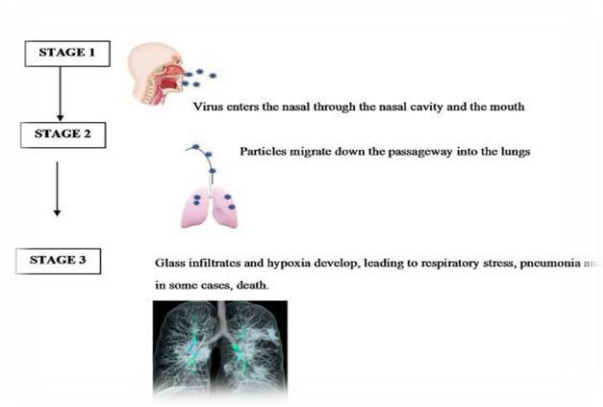

Fig (3)

1Diagram showing the stages of GOVID-19 pathogenesis. The virus enters the respiratory tract through the nasal cavity and mouth. The innate immune system is stimulated to trigger inflammation, which leads to a blockage of the alveoli. This leads to hypoxia and clouding of the lens, resulting in death.

Symptoms in the elderly

As their immune systems deteriorate with age, older people may get unusual symptoms. Additionally, weakened immunity can make an infection more likely. Elderly patients may have a different clinical presentation, and COVID-19 symptoms may need to be assessed using a somewhat different method in this patient population. Fever (which may appear as the temperature drops), cough and shortness of breath (which differ from chronic lung disease), and loss of taste or smell (which differ from symptoms brought on by drugs or neurodegenerative conditions that cause sensory impairment) are among the symptoms that may present differently in older adults. bodily aches and fatigue, which are frequent in older persons.More useful diagnostic criteria for SARS-CoV-2 infection in older persons may include sore throat, new congestion, nausea, vomiting, or diarrhea.

Seven emergency rooms throughout the country participated in a study, researchers found that delirium was identified as a presenting symptom in 28% (226 out of 817) of Covid-19 patients. It is worth noting that delirium was the main complaint in 16% of patients, They were 78 years old on average . The estimated prevalence of falls and weakness as Covid-19 symptoms ranged from 23.5% to 32%. Additionally, dehydration should be recognized as a significant symptom of Covid-19, especially among older adults. Therefore,It is essential that older persons rapidly receive the vaccine series and booster doses advised by local health authorities as soon as they become available [12].

Diagnosis of the disease

There are two main types of viral test

testing polymerase chain function on a nasal swab. However, due to the false negative rate of nasal swab PCR testing for SARS-CoV-2

clinical, laboratory and imaging test results may also be used to establish a provisional diagnosis.

1-Laboratory diagnosis

Discovery of CDV-2 SARS- RNA in respiratory samples (e.g. nasopharynx) based on opposite transcription polymerase chain reaction is the diagnostic standard of. However, the sensitivity of the test varies depending on the exposure time of the test. A modeling study estimated a sensitivity of on May 33 after exposure, 62% on day of symptom onset, and 80 = days after symptom onset. Factors that contribute to false passive test outcome include the appropriateness of the sampling mechanism, the time since exposure, and the source of the sample. Lower respiratory tract samples, example: B. bronchoalveolar lavage fluid, are more allergy than upper respiratory samples.. Of 1,070, samples collected from 205 COVID-19 patients in China, bronchoalveolar lavage fluid samples showed the top positivity average for SARS-CoV-2 PCR test outcome (93%), followed by sputum (72%) and nasal swabs (63%) and throat swabs (32%). SARS-CoV-2 can also be discovery in feces, but n't in urine [13].

spittle can be an substitute sample source that requires less personal protective mechanism and fewer swabs but need more thorough validation [14]. Various serological tests can also help prosopopoeia and measure response to new vaccines. However, the presence of antibodies may not confer immunity because not all antibodies produced in response to infection are neutralizing. It is not known whether and how often a second SARS-COV-2 infection occurs. It is not known whether the presence of antibodies alters susceptibility to subsequent infections or how long antibody protection lasts. IgM antibodies are discovery within 5 days of infection and higher IgM levels are achieved in the 2nd to 3rd week of disease. An IgG response is initial observed nearly 14 days after symptoms appear [15].

2-Imaging diagnosis

Characteristic abnormalities on chest CT for COVID-19 are spread ground -glass opacit Ground-glass opacities have poorly defined borders, air bronchograms smooth or unequal interlobular or barrier thickenings and thickening of the

adjacent pleura. In the early stages of the disease, chest CT-findings may be normal in approximately 15% of patients, and chest radiographs may be normal in approximately 40% of patients. Abnormalities may evolution fast in the initial two weeks after the onset of symptoms, after which symptoms gradually disappear. The chest CT findings are not specified and consistent with other infections. hence the diagnostic value of the breast.

CT scans are bound for COVID-19. Hospitalizations for certain illnesses caused by COVID-19 CT scans are scarce. hospitalized in certain patients as a result of

polymerase chain reaction and in whom SARS-CoV-2 infection was confirmed by examination tomographic examinations showed normal results, while chest imaging examinations showed-days of abnormal results were calculated, with cases of COVID-19 detected before SARS-CoV-2 RNA was detected in other patients [16].

Coronavirus prevention

Preventive strategies focus on patient isolation and careful infection control, including the use of appropriate measures in the diagnosis and clinical care of an infected patient. For example, when collecting samples, precautions must be taken to prevent droplet, contact and Sputum generation and airborne transmission must be prevented.

The following general suggestions have been made by the World Health Organization and other organizations:

1- It is advisable to refrain from having close contact with individuals who are currently experiencing inflamed lungs suddenly.

2- Wash the hands often, especially after coming into touch with an infected person or their surroundings .

3- Do not interact with farm or wild animals without protection .

4- Keep your distance, use tissues or disposable clothing to mask sneezes and coughs, and wash your hands if you have acute respiratory infection symptoms .

5- Increased use of strict hygiene measures, particularly in emergency medicine, to prevent and control infections.

6-Immunocompromised people should avoid public gatherings.

The key strategy for preventing the spread of the disease involves frequent hand washing, the use of portable hand sanitizers, and refraining from touching your face and mouth after being exposed to potentially contaminated environments. Relying solely on isolation and contact tracing may not be sufficient to control the spread, but their effectiveness can be enhanced by maintaining distance. A modeling study conducted in the UK, involving over 40,000 participants, revealed that combining isolation, contact tracing, and physical distancing measures resulted in a significant reduction in the number of cases requiring self-isolation and contact tracing. The efforts made by railways to implement these measures contribute effectively to limiting the transmission of diseases [17].

Personnel protection equipment, such as N95 or FFP3 masks, goggles, gowns, and gloves, should be used by healthcare professionals caring for infected patients to prevent contact and airborne transmission of the infection and to impede its spread.

How do you rehabilitate the respiratory system for elderly patients infected with Coronavirus in Dhi Qar?

According to follow-up research, those of acute lung disease (SARS) After leaving the medical center, some patients may continue to experience signs such as heartburn, hand tremors, fatigue, and limited lung disturbance, which may make it difficult for them to go about their daily lives and carry out their daily functions [18].

healthcare providers have created useful and practical recommendations for the lung rehabilitation of COVID-19 patients based on agreement and reference from prominent specialists. These rules' fundamental directives are the following:

1-The end goal of lung rehabilitation is to optimize the the individual's capacity while enhancing his way of life, which helps his return to society. The immediate goals of lung rehab are to treat tightness of respiration, nervousness, and melancholy.

2-Comprehensive examinations must be performed before starting the rehabilitation program. These evaluations should take into account the individual's medical symptoms, health status, supplemental tests, scans, and complications, as well as medical and activity risk assessments . Also, the patient's quality of life, tolerance to daily activity, emotional state, and dietary habits should be assessed using surveys. The results of these assessments can then be used to develop an individualized and progressive recovery plan, based on the patient's muscle strength, balance and mobility.

The plan could consist of the following elements.

(A). Aerobic exercises: such as walking, brisk walking, jogging, or swimming. These exercises should start at a low intensity and gradually increase in intensity and duration. It is recommended to perform them 3-5 times per week, each session lasting 20 to 30 minutes.

(B) Strength training: It is advised to progress with strength training. the volume of each muscle group training should be a maximum of 8-12 repetitions (RM) in 1-3 sets per session. The break between sets should be 2 minutes. This training should be performed 2-3 times per week, increasing the workload by 5–10% weekly . (C) Balance training:

People with balance problems should do balance exercises , which can include exercises without any equipment as well as exercises using balance training tools

(D) Respiratory training: In the event that the patient exhibits signs like loss of respiration, breathing sounds , or Following departure, breathing type retraining ought to be included if expectoration is problematic . This may include body position oversight , adjustment of breathing rhythm , exercises to strengthen the breathing muscles , and instruction

on expectoration , based on the assessments results. (E) Traditional Chinese medicine-based healthcare training: this type of training is mainly recommended for mild and moderate cases, In addition to patients evacuated from the hospital . As long as there is no objection to that (such as limb malformation or altered consciousness), activities like Section BA Jin, 24 Simplified Tai Chi, or 6 word Q i total can be performed for 30-50 minutes once a day.

3-Safety should be the top priority in all rehabilitation programs. If a sick peripheral capillary oxygen saturation (SpO2) drizzle less 88% or if they suffer symptoms like throbs, perspiring , chest tightness, or shortness of breath that are considered labile for rehabilitation by the clinician, it is substantial to immediately pause the rehabilitation program. This ensures the well-being and avoids any potential risks for the patient.

4- for mild and medium sutuations, it is recommended to begin rehabilitation interventions at the earliest opportunity. However, for severe and critical cases where the patient's condition is unstable or the disease is still progressing, it is crucial to prioritize life-saving measures. In such situations, pulmonary rehabilitation interventions should only be introduced once the case has stabilized. Furthermore, considering safety and the availability of human resources, severely or critically ill sicks must be restricted to their bed or bedside, minimizing movement. After being discharged, patients must permanence with personalized rehabilitation, while ensuring the strengthening of preservation and prevention against other infectious illnesses , example the common cold.

5- Compare on the whole rehabilitation for sicks with chronic illesses, the most notable aspect of rehabilitation for COVID-19 sicks is the contagious nature of the disease.therefore it is important to minimize procedures that can raise the factors of infection, for instructed cough, expiration training, and tracheal compression. To prevent infection, a sealed plastic bag should be used to cover the mouth through expectoration. Additionally, pulmonary rehabilitation for COVID-19 patients should mainly be conducted through educational videos, brochures, remote consultations, or online teaching. This approach helps conserve protective equipment and prevents transition-infection.

6- It is crucial to conduct evaluation and monitoring throughout the pulmonary rehabilitation program. Here is an example of the rehabilitation process for a patient with COVID-19 [19] [20].

Hence, we can prove that it is possible to rehabilitate the respiratory system for elderly patients infected with the Corona virus in Dhi Qar Governorate after following these teachings and applying them in the correct manner.

RECOMMENDATIONS

1- Make sure to maintain proper hand hygiene: Thoroughly wash your hands with soap and water for a minimum of 20 seconds. If soap and water are not accessible, you can utilize hand sanitizer containing at least 60% alcohol.

2- Wear face masks: Wear a mask when you are in public places and when you are in close proximity to others. Make sure to wear the mask properly, change it regularly, and avoid touching it while wearing.

3- Practice social distancing: Maintain a distance of at least one meter between yourself and others who do not live in the same household. Avoid large gatherings and crowded places as much as possible.

4- Avoid touching your face: Avoid touching your eyes, nose, and mouth with unwashed hands, as the virus can be transferred from contaminated surfaces to the respiratory system through touch.

5- Cover your mouth and nose when coughing and sneezing: Use a tissue or cover your mouth and nose with your bent elbow when coughing or sneezing, and avoid using your hands.

6- Clean and disinfect surfaces: Clean and disinfect surfaces and objects that are touched frequently using an appropriate cleaner.

7- Stay away from suspected or infected individuals: Avoid close contact with people who have respiratory symptoms such as coughing and sneezing, and seek medical care if you suspect you have been exposed to the virus.

8- Maintain food hygiene: Make sure to wash vegetables and fruits thoroughly before consuming them, and cook meat and fish thoroughly.

9- Practice personal hygiene: Ensure you shower regularly and clean your clothes and personal belongings regularly.

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