Chapter 14
Medical Aspects and Mental Health Challenges During COVID-19 Pandemic

Subhash Chandra Parija, Sukanto Sarkar, and Sunayana Choudhury

Abstract COVID-19 pandemic is a global crisis resulting in significant mortality and morbidity worldwide. Together with the severe acute respiratory syndrome (SARS) coronavirus which became a pandemic in 2002–2003 and the Middle East respiratory syndrome (MERS) which was surfaced in 2012, the current and novel pathogen-novel coronavirus 2019 is the third highly pathogenic human coronavirus that has emerged in the last two decades with rapid transmissibility. The major concern now is to save lives especially of the vulnerable population and also develop herd immunity which will protect the community as a whole. However, this pandemic has a significant impact on mental health and poses a challenge to an individual's psychological resilience. Patients, health professionals, and the general public are under severe psychological pressure which may lead to numerous psychological problems, such as anxiety, fear, depression, and disturbed sleep. The most prominent psychological symptoms seen are anxiety, depression, and stress-related symptoms apart from drug abuse, domestic violence, and higher rates of suicide. The whole population, i.e., those affected with the infection and those not infected, are equally affected with mental health issues. The health care worker who is at high risk to develop the disease has been reported to have disturbed mental health well-being. Various psychological treatments like awareness talk, demonstrating health coping strategies, dealing effectively with stress along with lifestyle modifications have shown to be helpful in such a situation. Psychological crisis intervention will play a pivotal role in the overall deployment of disease control. A mental health helpline which can provide easy access to mental health professionals and serve as a platform for expert counseling facilities for common people, patients, vulnerable population, and students is the need for this hour. It can help to deal with the fear, anxieties related to the infection and also the anxieties related to the uncertainties in the near future.

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This chapter will focus on the various medical aspects and mental health challenges during COVID-19 pandemic and the various strategies to overcome them efficiently.

Keywords COVID-19 · SARS · Pandemic · Psychological impact · Mental health · Psychological treatment

Introduction

Coronaviruses are RNA viruses that were discovered in the 1960s and are typically present in mammals and birds with potential for human disease. The classification of the different types of coronaviruses described so far is as shown in Fig. 14.1.

Coronaviruses were considered trivial viruses till 2002, after the emergence of SARS-CoV which caused pandemic in 2002–2003 (Habibzadeh & Stoneman, 2020). Unlike other coronaviruses that infect humans, SARS-CoV (2003–2003), MERS-CoV (2012), and the current SARS-CoV2 present with severe respiratory disease. The existence of the SARS-CoV2 came into focus with sequencing of virus from patients affected with unexplained pneumonia outbreak in Wuhan city of China in December 2019. The disease caused by this novel coronavirus (2019-nCoV) (also named as SARS-CoV2 by WHO) has been known as COVID-19 and has been causing huge outbreaks globally till today with mounting tolls (Bao et al., 2020; Li et al., 2020f).

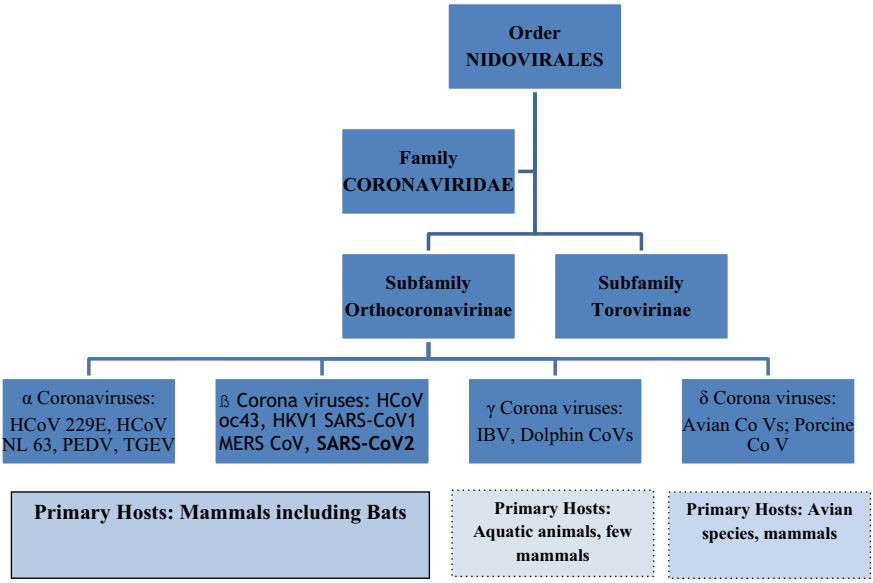

Fig. 14.1 Classification of the different types of coronaviruses. Shors (2021)

Novel Coronavirus 2019: An Overview

The causative agent of the so-called COVID-19 is the new virus labeled as 2019 novel coronavirus (2019-nCoV) by the WHO on 12 January 2020. The disease was formerly labeled as COVID-19 on 11 February 2020 by the WHO. On the same day, this virus was named as SARS CoV-2 by the International Committee on Taxonomy of Viruses (ICTV).

SARS-CoV-2 belongs to the ß coronavirus genera of coronavirus family and is the third known zoonotic coronavirus disease after SARS and MERS2. Although the primary and intermediate hosts of SARS and MERS are known, it has not yet been proved if a specific animal source harbors SARS CoV-2. It was proposed that SARS CoV-2 is a chimerical virus between a bats coronavirus and an unknown coronavirus and snakes are the most likely wildlife reservoirs. Subsequently it supported the theory that SARS CoV2 is transmitted from bats to humans (especially chrysanthemum headed bats). SARS CoV-2 genetic sequence has 86% homology with SARS CoV5 and high similarity with bat coronaviruses.

The current pandemic virus, 2019-n CoV or SARS-CoV-2, is structurally related to SARS-CoV that caused the 2002–2003 SARS pandemic. However, the present COVID-19 outbreak has thrown critical challenges for the Public Health, Research and Health Care teams all over the world.

SARS-CoV-2 is a novel strain of beta coronavirus, identified to be a responsible cluster of severe pneumonia cases in Wuhan, around January 2020, distinct from SARS-CoV and MERS-CoV (GISAID, 2020). On 11 February 2020, this novel virus was named severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) (Gorbalenya et al., 2020) by International Committee on Taxonomy of Viruses (ICTV) and as coronavirus disease COVID-19 (WHO, 2020a) by WHO on the same day. On 11 March 2020, World Health Organization (WHO) declared this severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) as pandemic (WHO, 2020b). Human transmission occurs by respiratory droplets, by close contact with an infected person during the act of coughing or sneezing thus transmitting aerosols within a distance of about 6 feet (Chan et al., 2020a).

Classification

Coronaviruses (CoVs) are enveloped, positive-sense, single-stranded RNA viruses that belong to the family Coronavirdiae, and order Nidovirales. Based on genomic organization and analysis of phylogenetic relationship, they are classified into the subfamily Coronavirinae that includes Alphacoronavirus (αCoV), Betacoronavirus (βCoV), Gammacoronavirus (γCoV), and Deltacoronavirus (δCoV) (Chan et al., 2013).

Analytical pattern on evolution of coronaviruses identified bats and rodents are the origin of αCoV and βCoV, while avians are the source of origin for γCoV and δCoV.

The first CoV, which was demonstrated during 1960s, was named as HCoV-OC43 and HCoVs229E (Drosten et al., 2003). Currently, all CoVs have been grouped in four genera, namely Alpha CoVs (HCoV-NL63, HCoV-229), Beta CoVs (HCoV-OC43, SARS-CoV, HCoV-HKU1, and MERSCoV), Gamma CoVs, and Delta CoVs (Fehr & Perlman, 2015).

Human coronaviruses which cause milder symptoms and commonly infect people include 229E, NL63, OC43, and HKU1. In certain circumstances, coronaviruses which evolve from animals that infect animals become a novel human coronavirus with severe forms of disease which include SARS-CoV, MERS-CoV, and the recently emerged 2019-nCoV.

Structure and Composition

Coronaviruses are spherically enveloped viruses measuring approximately 120- to 160-nm in size. The virus contains an unsegmented single-stranded positive-sense RNA (27–32 kb), which is the largest genome among RNA viruses. Isolated genomic RNA of coronavirus is highly infectious. The most specific feature of this virus is 20-nm-long club or petal-shaped projections on the outer surface of the envelope, giving the appearance of a solar corona. Within the envelope is the nucleocapsid which is helically symmetrical, measures around 9–11 nm in diameter.

Spike (S), membrane (M), envelope (E), and nucleocapsid (N) proteins are the main structural proteins present in the coronavirus. All these structural proteins are encoded within the 3′ end of the viral genome. The spike (S) glycoprotein (~180–220 kDa) makes up the petal-shaped peplomers on the surface of the virus. The trimeric S glycoprotein is a class I fusion protein which mediates attachment of the virus to the host receptor.

The membrane (M) glycoprotein is the most abundant and small structural protein in the virion (~20–35 kDa). This protein serves as a matrix protein embedded in the lipid bilayer and interacting with the nucleocapsid (N) and the spike (S) protein. The coronavirus E proteins (~8–12 kDa) are highly divergent and found in small quantities. The main function of E protein is to facilitate assembly and release of the virus, thereby playing an important role in pathogenesis.

The nucleocapsid (N) protein is heavily phosphorylated (~50–60 kDa) and it is this phosphorylation that tends to trigger a structural change by enhancing the affinity for viral RNA. This protein binds to nsp3 in the replicase complex, and M protein. Interaction of these proteins helps the viral genome to adhere to the replicase–transcriptase complex (RTC), thus packing the encapsidated genome into viral particles.

Some viruses, including human coronavirus OC43 (HCoV-OC43), contain a fifth structural protein, the hemagglutinin-esterase, HE (~65 kDa) that causes hemagglutination and has acetylesterase activity. This activity increases S protein-mediated cell entry thus helping viral spread through the mucosa (Brooks et al., 2019).

Genome and Viral Replication

SARS-CoV-2 is a single-stranded RNA virus that belongs to the genus coronavirus in the family Coronaviridae.The genome and the virion, measuring ~ 30 kb and 70–90 nm that are similar to other coronaviruses (Chan et al., 2020a; Kim et al., 2020). The genome encodes for all four structural proteins that are required to make assembly of complete virus particles. The genome of SARS-CoV-2 lacks the hemagglutinin-esterase gene.

On entry into the host cell, attachment SARS-CoV-2 to the host target cell receptor occurs by the interaction between the S protein and its receptor, virion gets attached to the target cell receptor, angiotensin-converting enzyme 2 (ACE2), being expressed on alveolar epithelial type II (AECII) cells, and also on extra pulmonary tissues such as heart, kidney, endothelium, and intestine (Yan et al., 2020). In the infected host cell, coronaviruses, S are cleaved by a furin-like protease enzyme into two separate polypeptides, S1 and S2. Of these cleaved S proteins, S1 forms the large receptor binding domain, while S2 forms the stalk of the spike protein. Following receptor binding, the virus must next gain access to the host cell cytosol via endosomal pathway. In the cytoplasm of infected cells, the viral RNA is released, which then undergoes translation and generation of replicase polyprotein pp1a and pp1b. These proteins are cleaved subsequently by virus encoded proteinases into small proteins. Finally assembly of virion takes place at the endoplasmic reticulum (ER) and Golgi complex. These assembled virions are then subsequently released out of the cells via vesicles (Hoffmann et al., 2020).

Immunopathogenesis of SARSCoV-2

Following entry of virus into the host cells, these viral antigens are processed and presented to the virus specific host immune cells, cytotoxic T cells. Subsequent activation of cytotoxic T lymphocytes releases excessive amount of proinflammatory cytokines (IL-1β, IFN-α, IFN-γ, IL-12, IL-6, IL-18, TNF-α, IL-33, TGFβ, etc.) and chemokines (CCL3, CCL2, CXCL8, CCL5, CXCL9, CXCL10, etc.), which leads to cytokine storm syndrome (CSS). Studies have shown that this cytokine storm syndrome is a lethal and uncontrollable inflammatory event in a patient infected with SARS CoV2. (Zumla et al., 2020; Li et al., 2020f).

Clinical Characteristics of COVID-19

COVID-19 infection is similar to the severe acute respiratory syndrome (SARS) that affected 29 countries, around 8,098 people, with 774 patients dead in the Asian countries.

Similarities Between SARS-CoV-2 and SARS

There are striking similarities between the two viruses (Hossam & Ashour, 2020; Chan et al., 2020b).

> The genome of SARS-CoV-2 has 86% similarity with SARS CoV 5; Bats are the probable primary hosts of origin of both SARS CoV-2 and SARS-CoV; Large and densely populated human settlements in close proximity to live animal markets are the source of outbreak in both the viruses [Huang market in SARS CoV2 and Guangdong market in SARS CoV]; The primary route of transmission for both viruses is respiratory droplets; After droplet spread, the ACE 2 is the receptor utilized by both the viruses for respiratory cells entry; The median incubation time and the initial estimate of transmissibility rate are similar for both the viruses; The progression to severe disease follows the similar pattern in both the viruses: ARDS occur 8-20 days after onset of first symptoms and HRCT findings of lung disease show greatest severity by 10days after initial onset of symptoms; The poor prognostic factors in both the diseases are elderly and presence of cardio respiratory and metabolic comorbidities.

Elderly patients are more symptomatic and have higher fatality rates compared to younger adults whereas males are proportionately higher in number than females in. The transmission rate varies from 0.3% to 3.77%. The case fatality rate is around 1.36% to 33% with an average around 3.17%.

Angiotensin-Converting Enzyme 2 (ACE2) is the identified receptor for SARS CoV-2. ACE2 is expressed on type I and type II alveolar epithelial cells with 83% expression on type II AEC. Males and Asians ethnicity have higher levels of ACE2 expression than females and other ethnic groups, respectively, which probably explain the observed predominance of cases in males and non-caucasians. ACE2 binding ability of SARS CoV is higher than SARS CoV (10–20 times) (Li et al., 2020f) (Table 14.1).

Coronavirus Infection: How Is It Different from Common Flu?

As the COVID-19 outbreak continues to evolve, comparisons are drawn in relation to influenza. Both cause respiratory disease, yet there are important differences between the spread of both the viruses. This has important implications for the public health measures that can be implemented to respond to each virus (Adhikari et al., 2020).

Firstly, COVID-19 and common flu have a similar disease presentation. Both cause respiratory disease, which presents as a wide range of illness from asymptomatic or mild through to severe disease and death. Both the viruses are transmitted by contact, droplets, and fomites. In terms of the differences, influenza has a shorter median incubation period (the time from infection to appearance of symptoms) and a shorter serial interval (the time between successive cases) than COVID-19 virus. The serial interval for COVID-19 virus is estimated to be 5–6 days, while for influenza virus, the serial interval is 3 days. Further, transmission in the first 3–5 days of illness and the appearance of symptoms is a major driver of transmission for influenza while there

Table 14.1 Clinical Studies on COVID-19

Author	N	Age Range (years)	Mean Age (years)	Sex (Male %)	Predominant clinical symptoms
Huang et al., (2020)	136	25–89	-	66	Fever, cough, dyspnoea
Chen et al. (2020a)	99	21–82	55.5	67	Fever, cough, hemoptysis
Chung et al., 2020	21	29–77	51	13	Fever, cough, myalgia
Chen et al. (2020b)	29	26–79	56	21	Fever, cough, dyspnoea
Wang et al. (2020a)	138	42–68	56	75	Fever, cough, dyspnoea, myalgia
Liu et al. (2020)	137	20–83	57	61	Fever, cough, myalgia
Chang et al. (2020)	13	34–48	34	10	Fever, cough, myalgia
Wang et al. (2020b)	34	–	8	14	Fever, cough
Yang et al. (2020)	52	33.6–85.8	59.7	35	Fever, cough, dyspnoea

are people who can transmit the COVID-19 virus 24–48 h prior to symptom onset, i.e., the pre-symptomatic phase does not appear to be a major driver of transmission. Also, the reproductive number—the number of secondary infections generated from one infected individual—is around 2 and 2.5 for COVID-19 virus, which is higher than for influenza.

Children are an important vehicle of transmission in case of influenza virus in the community. For COVID-19 virus, initial data indicates that children are less affected than adults and that clinical attack rates in the 0–19 age group are low. Further preliminary data from household transmission related studies suggests that children are infected from adults, rather than vice versa.

While the range of symptoms for the two viruses is similar, the fraction with severe disease appears to be different. For COVID-19, data to date suggests that 80% of infections are mild or asymptomatic, 15% are severe infections, requiring oxygen and 5% are critical infections, requiring ventilation. In influenza or common flu the percentage of severe or critical infection is relatively less than 1%.

Mortality for COVID-19 is two times higher than for influenza, especially seasonal influenza. The crude mortality ratio is between 3–4%, but the infection mortality rate is lower. For seasonal influenza, mortality is usually well below 0.1%. However, mortality is to a large extent determined by various factors and varies from country to country. Mortality rates are low in India in relation to other developed countries.

Now if we see the difference in between the two infections it is clear the corona viral infection is more severe, with high mortality and prone to cause more severe illness. It affects mainly the elderly and people with comorbid disorders like diabetes, hypertension, and pulmonary disease.

Drugs Used for COVID-19

It has been more than six months since the first COVID-19 infection was reported. Now, even as the SARS-CoV2 pandemic has left over half a million people dead, there is still no cure against the virus that causes COVID-19. As such, antibiotics do not help with viral infections, but some old antiviral drugs (https://www.business-standard.com/topic/drugs) have been repurposed to treat COVID-19 patients. Researchers worldwide are testing various possible treatments that would help patients recover faster from the disease (Sanders et al., 2020).

Most of the organizations including WHO advocate supportive care which is aimed at relieving the symptoms and might include pain relievers (ibuprofen or acetaminophen), cough syrup or medication, rest, and fluid intake.

The US Food and Drug Administration (FDA) granted emergency-use authorization for antiviral drug remdesivir (developed by Gilead, originally for Ebola) to treat severe COVID-19 patients. Several corticosteroids like dexamethasone have also been recommended for use, apart from supplemental oxygen or mechanical ventilation (Md Insiat Islam Rabby, 2020).

Immunosuppressant drugs, too, are being tried to treat COVID-19 patients with abnormal immune response against the virus. Doctors have also prescribed drugs (https://www.business-standard.com/topic/drugs) like Roche's Tocilizumab, used typically for rheumatoid arthritis. The immune system of patients with COVID-19 often goes into an overdrive and produces an excess of immune-signaling molecules called cytokines. This cytokine release syndrome, popularly called the "cytokine storm," leads to hyper inflammation. This, in turn, exacerbates breathing difficulties and might lead to acute respiratory distress syndrome (ARDS). Drugs like Tocilizumab and Interferon alfa-2b (used to treat Hepatitis B & C) help suppress the immune system response by blocking certain receptors called interleukin-6 (IL6). Interferon alfa-2b is under clinical trial for COVID-19 treatment now.

Below is the list of common drugs that are being used in India for treating COVID-19 patients. These are all "off-label" uses of drugs or approved for "emergency use," as none of these is a proven treatment for the disease. Some are undergoing trials, too (Naveed et al., 2020).

Hydroxychloroquine (HCQ)

India is using HCQ as a prophylactic (or preventive) for frontline medical workers, police, etc. It is also approved as a treatment in mild cases with some caveats (not to be used on people with retinopathy, cardiac rhythm disorders, and kids below 15 years of age). After US President Donald Trump touted this drug as a magical medicine for COVID-19, several global trials like the WHO Solidarity trial and UK's Recovery trial have not found conclusive evidence to suggest proven benefits of HCQ.

Favipiravir

Oral antiviral drugs approved for use in Japan for influenza patients recently got the regulator's approval in India for emergency use on patients with mild to moderate conditions. Mumbai-based Glenmark conducted clinical trials for India and launched the drug, within a month of the launch. Researchers have suggested that favipiravir gets incorporated into the viral RNA which induces mutations to the RNA and eventually causes reduction in viral load. The drug may be binding itself to certain areas of the viral RNA polymerase (enzyme) and it stops the enzyme from doing its work (i.e., making new RNA). Basically, it can help stop the virus from making more copies of itself inside the patient's body. The drug cannot be used for patients with renal or hepatic (liver) conditions.

Remdesivir

Developed by US-based Gilead Sciences for Ebola, this drug has been approved in India for hospital use. It is an injectable drug, and two companies have launched it so far—Hetero's Covifor and Cipla's Cipremi. Clinical trials have shown that remdesivir helps shorten the recovery time and in turn the hospital stay. It, however, does not reduce mortality. Remdesivir works by faking out genetic building blocks and thus interrupting the viral replication. This stops the virus from making copies of it, reducing the viral load.

Tocilizumab

This drug is used in hospitals to treat severe COVID-19 patients, especially those experiencing cytokine release syndrome. It works to reduce the inflammation that happens when a patient's immune system reacts abnormally.

Itolizumab

The drug was launched in 2013 to treat plaque psoriasis. The drug was approved on July 11 by the Drug Controller General of India (DCGI) for restricted emergency use for treating moderate to severe coronavirus (https://www.business-standard.com/about/what-is-coronavirus) disease cases. The drug works by regulating the immune system which helps slow down the release of inflammation-causing cytokines. It works best when given to patients before the immune system is hyper-activated.

Steroids

Indian clinical management protocol has use of steroids like dexamethasone. This inexpensive steroid has been found to be effective in treating patients. According to the World Health Organization (WHO), "it was tested in hospitalised patients with Covid-19 in the United Kingdom's national clinical trial 'Recovery' and was found to have benefits for critically ill patients." WHO further said, according to preliminary findings, the treatment was shown to reduce mortality by about a third for patients on ventilators, and mortality was cut by about a fifth for patients requiring only oxygen. Dexamethasone falls under a broader class of drugs called corticosteroids and is a steroid known for its powerful anti-inflammatory properties. It is administered for various conditions like allergies, immune system disorders, even arthritis. Methylprednisolone is another corticosteroid being used by Indian doctors to handle moderate to severe COVID-19 cases.

Heparin

A common anticoagulant drug (that reduces blood clots from forming in the body), this is used in treating COVID-19 patients. The SARS-CoV-2 virus works by using its spike protein to attach to human cells and begin infection. According to recent findings, heparin can bind with the surface spike protein and can potentially block the infection. Researchers at Rensselaer Polytechnic Institute in the USA have said heparin could effectively neutralize SARS-CoV-2. So far, low-molecular-weight heparin has also been used to reduce the risk of developing clots in patients as the virus triggers a thrombotic pathway leading to formation of blood clots. Clots can develop in veins of legs, etc., when people are hospitalized and confined to beds. If the clot is dislodged, it can cause stroke, myocardial infarction (commonly understood as heart attack), pulmonary embolism, etc. Heparin is an anticoagulant and a low-cost drug.

Convalescent Plasma Therapy

In this experimental therapy, blood plasma from patients who have recovered from COVID-19 infection is collected and transfused into a currently sick person. It gives the receiver a "borrowed immunity" as the antibodies that a recovered person has are passed on to the sick person. This helps them fight the pathogen. This therapy was used in SARS1 in 2003 and also in MERS in 2012. Plasma banks for this have already been set up in some states.

Past Pandemics and Their Impact

An epidemic is a disease that affects a large number of people within a community, population, or region whereas a pandemic is an epidemic that's spread over multiple countries or continents. For example, when COVID-19 was limited to Wuhan, China, it was an epidemic and subsequent geographical spread turned it into a pandemic. The classic pandemic was the Spanish flu pandemic which happened in 1918 was an unusually deadly influenza pandemic caused by the H1N1 influenza A virus. Lasting more than 12 months from spring 1918 to early summer 1919, it infected 500 million people, i.e., about a third of the world's population at the time. The death toll is estimated to be as high as 100 million, making it one of the deadliest pandemics in human history (Spinney, 2018). The 2009 swine flu pandemic was an influenza pandemic that lasted for about 20 months, from January 2009 to August 2010 (Pederson, 2018; Pfefferbaum et al., 2012).

Other pandemics in recent times were the AIDS pandemic, Ebola virus pandemic, severe acute respiratory syndrome (SARS) pandemic in 2003 and subsequently the Middle East respiratory syndrome (MERS). Both SARS and MERS are caused by the new coronavirus (nCoV) (Yin & Wunderink, 2018). Mental health well-being is the most integral part of each pandemic as it not only causes mortality but it also increases psychological morbidity in terms of fears about our health and the health of our loved ones, fears associated with an economic downturn, social isolation, and the uncertain future. All these will cause stress-related symptoms like depression, anxiety, insomnia, and different bodily symptoms. It can also cause worsening of the pre-existing medical conditions like diabetes, hypertension, and asthma (Reynolds et al., 2008). Pandemics often cause severe fear and the terms like "the end of the world," "hospitals are overwhelmed," "people will die without receiving treatment," and "there will be no jobs to do, no food to eat" (Lee et al.,). Uncertain prognosis, lack of adequate treatment, shortage of protective gears and testing facilities, public health measures that infringe on personal freedoms, large and growing financial losses, media news and press releases, information on social media are among the major stressors that undoubtedly will contribute to widespread emotional distress and increased risk for psychiatric illness associated with pandemics (Lima et al., 2020; Asmundson & Taylor, 2020a, 2020b).

Specific Challenges Related to COVID-19 Pandemic

Mental health issues are a great challenge during pandemics like COVID-19. The immediate concern is rightly how to save lives and restrict the spread of infection. But another important question is the effect on the long-term mental health of human beings. The future with COVID-19 is unclear and an ongoing global effort to monitor and understand the mental issues is urgently needed (Kar et al., 2020). Mental health issues are expected in the whole population but special emphasis should be given to vulnerable populations like people infected with COVID-19 and their families, health care workers and their families, mental health issues for special populations like students, elderly, children, migrant workers, stranded people in different cities and countries, etc. (Rehman et al., 2020). Also the effect of lockdown and social isolation on the general population is enormous which leads to uncertainties in relation to job, business, finances, travel, and future projects (Kar et al., 2020; Rehman et al., 2020). However, there are specific recommendations from international bodies like the National Health Commission and World Health Organization (WHO) regarding addressing the mental health issues especially handling emergency psychological crises during this COVID-19 pandemic (WHO, 2020d).

The reason that COVID-19 is causing much distress and a wave of uncertainties is because of the following factors:

1. It is more infectious and lethal than the common flu.
2. Though it severely affects mostly the elderly and people with comorbidities, there are various instances that young individuals without many medical issues also succumb to this disease.
3. There is no specific drug to treat the virus nor their specific vaccines available currently to prevent a healthy population from getting infected.
4. There are also lots of uncertainties about the future course and progress of the infection.

All these contribute to mental distress in individuals which is evident by the rising mental health issues seen in the population while coping with the COVID-19 pandemic. Social distancing, wearing a mask, avoiding gatherings, frequent washing of hands, avoiding unnecessary travel, and experiencing frequent lockdown and restriction of movement are the new normal which also can contribute to stress and subsequent mental health issues (Adhikari et al., 2020).

Quarantine and Lockdown

Another aspect of the pandemic worth addressing is the quarantine and lockdown and its effect on mental well-being. When the COVID-19 infection started spreading in Wuhan, the Chinese government implemented a strict lockdown of the city. Residents started comparing the situation to “the end of the world,” “overwhelmed situation,”

and "severe shortage of food and money." "Panic in Wuhan" was a common headline at newspapers and magazines (Ingrid, 2020). The psychological effects of lockdown can be understood in different perspectives. Firstly, the announcement of lockdown indicates a serious situation and might worsen in future. Secondly, lockdown is associated with a loss of control and a sense of being trapped, which is more in families which are separated geographically. Thirdly, there is a direct effect of lockdown on employment, financial issues, availability of essential commodities, and social isolation. Lastly, uncertainty about the future and a fear that lockdown will be extended further and normalcy will not be restored soon in near future (Thakur & Jain, 2020).

Psychological and Emotional Impact of COVID-19

The novel coronavirus 2019 (COVID-19) pandemic has created a global crisis and healthcare infrastructure across several nations worldwide are struggling to deal with it (Bao et al., 2020). The rising number of frontline health workers who are infected has also put a strain on the workforce. Further, the unpredictability and uncertainty related to estimation of duration for which the situation would persist and disrupt lives (Zandifar & Badrfam, 2020), number of individuals it will infect and kill worldwide, and future public safety has made things worse. All these are likely to have serious and long-standing repercussions for the psyche and mental health of individuals and societies (Pfefferbaum & North, 2020).

"In February 2020, a 50 year old man in a village in Andhra Pradesh, India; and in March 2020, a 36-year-old man in a village in Bangladesh committed suicide because they and the villagers thought that they were infected with COVID-19 since they were suffering from symptoms of fever and cold. Unfortunately, no diagnosis was made and an autopsy in one of them confirmed non COVID19 status. In Delhi, India, a man, suspected to be infected with COVID-19 and admitted in the isolation ward of the Safdarjung Hospital allegedly committed suicide by jumping off the seventh floor of the hospital building. In King's College Hospital, London, a young nurse took her own life while treating COVID-19 patients." Elevated levels of xenophobia (fear of foreign or unusual objects and events) of COVID-19, misconceptions, social prejudice & avoidance by hichthe virus to family and others, constant fear of infection, distress & helplessness of witnessing infected people die, are factors that in various combinations and degrees may have contributed to these tragedies (Goyal et al., 2020; Mamun & Griffiths, 2020; Chen et al., 2020a).

During ongoing pandemics, disruption in usual activities, routine, livelihoods, separation from/loss of family members or friends or colleagues, persistent fears of getting infected or dying, coping with prolonged uncertainty and unpredictability have detrimental effects on mental health in the short term and potentially in the long term as well (Rajkumar, 2020).

Impact on Various Populations

Public health emergencies are well known to impact the health, safety, and well-being of individuals and societies. The repercussions are likely to be manifested through a wide range of emotional reactions from experiencing "distress" to "psychiatric symptoms or syndromes"; indulgence in unhealthy behaviors (excessive substance use); as well as noncompliance with public health directives (protective gears, home confinement) among infected patients and the general public (Asmundson & Taylor, 2020a, 2020b).

Patients Infected with COVID-19

Suspected or confirmed patients with COVID-19 infection predominantly experience fear related to fatality and high infectivity (Wang et al., 2020a; Li et al., 2020f). Those undergoing quarantine are likely to experience anger, denial, despair, insomnia, boredom, loneliness, depression, anxiety, substance abuse, tendency to self-harm and suicidality (Wang et al., 2020a; Li et al., 2020f; Dong & Bouey, 2020; Yi et al., 2020; WHO, 2020e). Even the survivors of COVID-19 are vulnerable to developing various mental health disorders like post-traumatic stress disorder, anxiety, and depression (62). Patients may develop obsessive–compulsive disorder (OCD) while trying to implement and continue with COVID-19 related safety behaviors as well (Li et al., 2020f). Also, physical symptoms related to COVID-19 infection like cough, fever, hypoxia together with side effects of prescribed medications (corticosteroids) may cause additional distress and anxiety (Kar et al., 2020; Wang et al., 2020a).

Family Members and Close Contacts

The family members and close contacts of persons with COVID-19 face various psychological repercussions during isolation or quarantine. Feelings of anxiety, worry, shame, guilt, or stigma for already sick and/or quarantined family members, and related concerns about the outcome of infection and stigma on family and friends are widely evident (Wang et al., 2020a). It has been found that family members and close contacts of people infected with COVID-19 may develop PTSD and depression (Goyal et al., 2020), while those who lose their loved ones may tend to experience anger and resentment (Goyal et al., 2020). Further, isolated or quarantined children have higher probability of developing grief, acute stress reactions, and adjustment disorder (Kar et al., 2020; Shah et al., 2020).

Further, in current circumstances, to adhere to social distancing rules and avoid contagion, those who have lost loved ones are unable to undertake the natural mourning process, funeral and crematoria services, or perform last rites. This may lead more people to develop pathological grief reactions and adjustment disorders subsequently.

Healthcare Workers

Healthcare professionals, particularly frontline workers directly involved with diagnosing, treating, and caring for patients infected with COVID-19, are vulnerable to developing emotional distress and other mental health problems. A steady and enormous increase in the number of confirmed and suspected cases, excess workload, unpredictability and confusion within the work environment, intermittent shortage of protective devices, involvement in resource-allocation decisions distraught with emotional or ethical concerns, perceived inadequate support and stigmatization may all contribute to their mental health burden (Lai et al., 2019; Pfefferbaum & North, 2020). Apart from these they have to cope with the distress of losing patients in unprecedented numbers while trying to protect their own health. To care for health care workers and colleagues as patients can be emotionally challenging too (Maunder et al., 2003). Work may often involve being caught in unusually adverse and dehumanizing conditions due to overwhelming numbers of admitted cases, critical cases and deaths. Risk of exposure to the virus, concern about infecting and caring for loved ones, dilemma of prioritizing professional versus personal duty and responsibilities are some of the additional challenges that further contribute to the burden on healthcare workers (Tsamakis et al., 2020; Rana et al., 2020; Zhang et al., Zhang, Wang, et al., 2020). While on COVID-19 duty, inaccessibility to food, water, beverages, and even restrooms can be physically challenging and may lead to other health complications like dehydration and oxygen saturation imbalances among frontline medical workers (doctors and nurses) directly caring for patients infected with COVID-19.

Moreover, it is also documented that in dispensing care to patients healthcare workers are vulnerable to develop certain specific mental health conditions like ***vicarious traumatization (VT)*** and ***secondary traumatic stress (STS)*** which bear significant mental, emotional, social, and economic costs. ***Vicarious traumatization (VT)*** (McCann & Pearlman, 1990) refers to "harmful changes in the cognitive schema of professional helpers related to self, others, and the world as a result of exposure to graphic and/or traumatic material." It is associated with disruptions in five areas of psychological need, viz. safety, trust, esteem, intimacy, and control and "can result in decreased motivation, efficacy, and empathy" (Baird & Kracen, 2006). ***Secondary traumatic stress (STS)*** (Figley, 1995; Stamm, 1999) refers to "a syndrome characterised by exhaustion, hypervigilance, avoidance, and numbing among health care professionals, family members, friends, and caregivers of people who have experienced traumatic events and suffer from post-traumatic stress disorder (PTSD) themselves" (Baird & Kracen, 2006; Elwood et al., 2011; Figley, 1995; Stamm, 1999). It

is due to secondary exposure of the traumatic event (Guitar & Molinaro, 2017). **VT** and **STS** are associated with various mental, physical, and emotional problems for health care professionals like burnout, decreased self-worth and low morale. As a result they can lead to higher staff turnover and decreased productivity among them (Showalter, 2011; Simon et al., 2005). They are both an occupational hazard and an organizational concern (Baird & Kracen, 2006; Louth et al., 2019; McCann & Pearlman, 1990). However, emerging research has also indicated development of **vicarious resilience** in the form of strength, growth, and empowerment among few health care providers affected by **VT** and **STS** (Puvimanasinghe et al., 2015).

Adverse psychological reactions to severe acute respiratory syndrome (SARS, 2003) outbreak were observed and well documented among health care workers (Maunder et al., 2003; Bai et al., 2004; Lee et al., 2007b; Chua et al., 2004). In fact, during Middle East respiratory syndrome (MERS) coronavirus infection, health care workers were found to be at higher risk of developing symptoms of PTSD (Lai et al., 2019; Maunder et al., 2003). Therefore, it is imperative that employers and organizations implement necessary measures to support the mental well-being of their staff (Maunder et al., 2003).

Children and Women

According to the UNESCO Director-General Audrey Azoulay "the global scale and speed of the current educational disruption is unparalleled" (WHO, 2020d).

This is a new and challenging situation for children as well. Physical distancing from friends due to social distancing norms can be distressing. School closure has led to a disruption of daily routine and structure in their lives. School routine is an important coping mechanism for most children with access to various resources like cognitive stimulation, socialization, peer support, creativity, extracurricular and fun activities. There can also be fears and queries related to COVID-19 itself. All these can make them anxious and stressed which may manifest in boredom, restlessness, irritability, hypersensitivity. During times of crisis children can also seek more attachment and be more demanding of parents (Kar et al., 2020; WHO, 2020d).

Further, in several countries, Board, College, University exams have been postponed indefinitely or canceled creating a huge academic and financial burden on young students. Cancelation of anticipated events, delayed exams, crucial time lost in career development and academic progress, lack of clarity about future prospects and job markets have left them confused, helpless, and frustrated. This may culminate in sleeplessness, decreased appetite, and irritability among the older children and youth. Remaining healthy in order to undertake upcoming exams can be an added stressor (WHO, 2020d; Rajkumar, 2020).

Moreover, children in abusive homes are socially isolated with the possibility of abuse exacerbating especially during present conditions of stress and economic uncertainty. Increased incidence of neglect, exploitation, and child abuse were also reported during the Ebola outbreak in Africa. A surge in reported cases of domestic

violence in comparison with the previous year was noted during COVID-19 in a province in China in February 2020 (WHO, 2020d).

As the pandemic continues, it is essential to support children and adolescents experiencing distress related to bereavement, parental unemployment, loss of household income. It is also important to monitor the long-term mental health outcome among them in order to understand the effect of the pandemic, prolonged school closures, and public health safety measures on their well-being.

Across many countries during COVID-19 pandemic, incidence of domestic violence has increased significantly, as governments world-over enforced strict quarantine rules to prevent the spread of COVID-19 (Taub, 2020; Van et al., 2020). The contributing factors seem to be exposure to economic and psychological stressors, increase in negative coping mechanisms (such as alcohol misuse), social isolation and an inability to access usual support systems or escape abusive environments. In India too there has been an increase in domestic violence among women during the extensive lockdown phase (Gulati & Kelly, 2020).

General Public, Older Adults, and High Risk Individuals

Necessary restrictions like social isolation and quarantine are likely to have detrimental impact on mental health both in short and long run (Dong & Bouey, 2020). Indian society being a collectivistic culture that is rooted in social connectedness and social support is perhaps feeling the impact of essential public safety measures like movement restrictions, self-isolation, social distancing and quarantine more strongly (Muktar, 2020). The psychological impact of quarantine may manifest in post-traumatic stress symptoms, confusion, and frustration (Brooks et al., 2020).

When faced with a public health emergency/infectious life threatening diseases people tend to develop more of negative emotions like anxiety, aversion, or fear along with negative cognitive appraisals as a means of self-protection. Behaviorally, this may be reflected in overreacting to situations, excessive avoidance, and blind conformity. Moreover, persistent negative emotions experienced over long periods of time may endanger the immune system of people and disrupt normal physiological mechanisms (Kiecolt-glaser et al., 2002; Mortensen et al., 2010; Schaller, 2006; Schaller, 2006; Schaller et al., 2015; Slovic, 1987). Few studies involving sociodemographic characteristics mentioned greater psychological impact of the pandemic on female gender and student population associated with higher levels of stress, anxiety, and depression. The uncertainty and potential negative impact on academic progression may adversely affect students' mental health. Also, the general public lacking formal education were found to have greater likelihood of depression during this time (Wang et al., 2020a).

This crisis is also likely to impact the mental health of the vulnerable individuals, particularly those who are isolated or with pre-existing mental and physical health difficulties. Patients with chronic physical illnesses (like chronic renal failure, diabetes mellitus, and cardiac diseases) in need of regular follow-up to hospitals may

deteriorate. Patients with pre-existing severe mental illness (SMI) are also affected by inaccessibility to care. Those hospitalized in closed wards are at high risk of infection while outpatients are facing significant difficulties to receive maintenance treatment which can lead to a relapse of their condition (Ho et al., 2020). Older adults, particularly the once in isolation or with cognitive decline/dementia, may experience more stress and exhibit symptoms of increased anger, agitation, anxiety, and withdrawn behavior during the outbreak or while in quarantine (WHO, 2020e). Also, the emotional distress, anxiety, and challenges related to circumstances around COVID-19 may cause symptom exacerbation, resurgence, or relapse in patients with past history of mental illness as they are already vulnerable (Kar et al., 2020; WHO, 2020d).

The concept related to emergence of traumatic responses through exposure to victims/survivors of trauma can be extended to large scale public health disasters like the COVID-19 pandemic as well. Such impact exceeds psychological and emotional tolerance of the general public causing serious distress and indirectly leading to significant physical and mental symptoms (Mathiet, 2014). Some of these symptoms include sleep disorder, loss of appetite, physical decline, fatigue, inattention, fear, numbness, irritability, and despair. Often these may be accompanied by trauma reactions and interpersonal conflicts which may even result in suicide (Creighton et al., 2018).

Migrant Population

The psychosocial issues among migrants during COVID-19 are many. During the lockdown period of India the nationwide ban on travel, lack of work led to severe financial crisis to take care of daily expenses and tackle the strict quarantine rules. All these have resulted in high levels of anxiety, which in turn induced stress, depression, and panic attacks among internal migrant workers (Choudhari, 2020). The migrant workers are suffering from high degrees of anxieties and fears due to various concerns in COVID pandemic and are in need of psychosocial support. The major factors that might affect the predisposition of the internal migrant workers for adverse mental health manifestations are lack of jobs, financial constraints, away from family, social isolation, substance abuse and proneness to develop common mental illness (Rothman et al., 2020).

Psychosocial Intervention

Unlike trauma experienced during natural disasters leading to PTSD, the effects of life threatening viral infections are usually depressive and anxiety disorders. Some groups may be more vulnerable than others to the psychosocial effects of pandemics. In particular, infected patients, frontline workers (healthcare and others), high risk

individuals (including the elderly, people with compromised immune function, and those living in congregate settings), and people with pre-existing medical, psychiatric, or substance use conditions, or those with vulnerable psychological traits are at heightened risk for adverse psychosocial sequalae (Li et al., 2020f).

Common psychological reactions like frustration, worry, nervousness, loneliness, annoyance, anger, sadness, fear, helplessness, and guilt are typically experienced during and after such crises (Ahorsu et al., 2020; Banerjee, 2020; Cheung et al., 2008; Zhang, 2020). During and after the severe acute respiratory syndrome (SARS) pandemic in 2003, the suicide rate among elderly population was found to increase in Hong Kong (Cheung et al., 2008). In extreme situations, such mental health problems can lead to suicidal behaviors (e.g., suicidal ideation, suicide attempts, and actual suicide). Other disturbing emotional responses like grief and bereavement, shame, post-traumatic stress symptoms, panic attacks, sleep problems, mood problems, boredom, stigmatization, marginalization, mass hysteria, xenophobia, uncertainty, and ambivalence are also seen (Mukhtar, 2020) (Wang et al., 2020a).

It has been reported that greater satisfaction with health information received from government and health authorities was associated with less psychological impact of the pandemic and lower levels of depression, stress, and anxiety (Wang et al., 2020a; Rubin & Wessely, 2020). Accurate and updated health information, especially focusing on number of recovered individuals, status of medicines/vaccines, routes of transmission helped to avoid/minimize adverse psychological reactions among people receiving them as evident from lower levels of reported anxiety and stress (Wang et al., 2020a).

There is now a pressing need for mental health support, assessment, treatment that calls for urgent mobilization of mental health care services. Effective and timely addressal of such wide scale and diverse mental health issues require multilevel, multiorganizational, and multidisciplinary collaboration and coordination.

Recommendations for Mental Health Service Provision: Policies and Framework

It has been recommended that mental health interventions for the public must be formally integrated into public health preparedness and emergency response plans for tackling the pandemic. There is an urgent need for mental health bodies and academic associations to identify and organize mental health expert teams who would coordinate with health authorities. These teams can formulate guidelines and instructions for administration and initiation of mental health services, develop emergency psychological crisis intervention modules, and establish psychological assistance special teams to provide professional guidance, training, and preparedness for other personnel involved (National Health Commission of China, 2020). The guidelines should be implemented under the guidance of trained mental health professionals.

Such multidisciplinary intervention teams can be created in India as well to function at national, state, district, and municipality levels (Fig. 14.1).

Principles of Psychosocial Intervention

Any psychological intervention should be based on *principles* of:

1. *Integrating* psychological crisis intervention into general deployment of pandemic prevention and control in order to *reduce potential psychological damage* caused and *promote social stability.*
2. Implementing *targeted interventions for different groups* and *preventing secondary trauma* for both providers and patients. The target groups include:

    a. Confirmed patients
    b. Suspected patients
    c. Health care and related personnel
    d. People in close contact with the patient (family members, colleagues, friends, etc.)
    e. Patients who do not want to seek medical treatment
    f. Susceptible people and the general public

Specialized mental health support should also be delivered to individuals with pre-existing mental or physical disorders, healthcare and aid workers, especially nurses and physicians working directly with sick or quarantined individuals (Shigemura et al., 2020; Cosic et al., 2020). This should include regular clinical screening for anxiety, depression, and suicidality in patients suspected/diagnosed with COVID-19 and frontline health professionals.

Separate interconnected mental health service teams can be constituted, viz.,

- **Psychological intervention medical team**—comprising psychiatrists, clinical psychologists, and psychiatric nurses, this can be an autonomous team or part of the medical team. Staff with experience in psychological crisis intervention should be preferred.
- **Psychological assistance hotline team**—comprising mental health workers with psychological hotline training and volunteers experienced in psychological crisis intervention in public emergencies. Psychological assistance training on COVID-19 outbreak and supervision should be made mandatory before joining (Bouey, 2020).

All psychosocial interventions must begin with necessary **psychological evaluation** to understand the risk factors, mental health status, and needs of the target individuals/groups. The intervention must be based on findings of initial psychological assessment or screening done. All these services can be provided both through **Onsite** and **Online** platforms (Fig. 14.2).

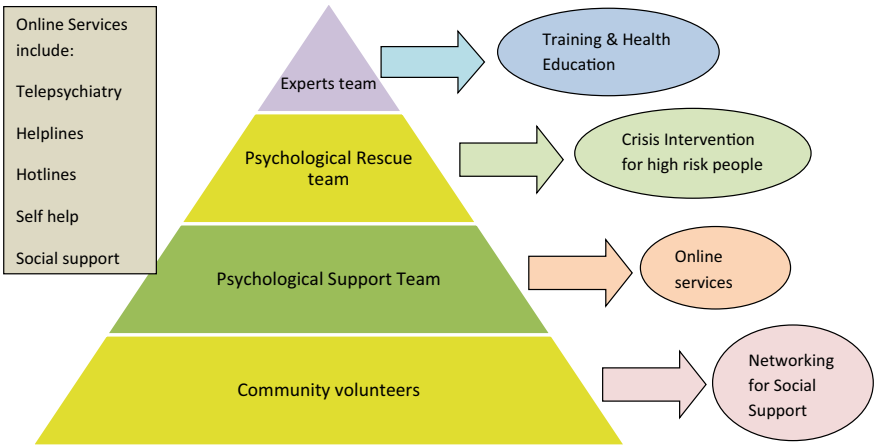

Fig. 14.2 Organization framework for management of psychological crisis during COVID-19 pandemic

Strategies for Psychosocial Intervention

Psychological management services during such pandemics will specifically involve provision of.

- Psychological First Aid (PFA)
- Psychological Crisis Intervention (PCI)
- Psychological Support

Psychological First Aid (PFA) is a systematic set of helping actions used by disaster mental health professionals and others to provide immediate support to trauma survivors. It aims to reduce the initial distress and assist with short- and long-term adaptive functioning. Five empirically supported principles on which PFA interventions are based during the early to middle stages of post disaster or trauma include: **(a) Promoting sense of safety, (b) Promoting calming, (c) Promoting sense of self and community efficacy, (d) Promoting connectedness, and (e) Instilling hope** (Ruzek et al., 2007).

According to the WHO PFA Guide (2011), *"Psychological first aid involves humane, supportive and practical help to fellow human beings who have suffered a serious crisis event."* (WHO, 2016). Current PFA models have been designed in such a way that it can be delivered in any setup by anyone who can access and offer early assistance to the affected people including any health personnel, disaster response or humanitarian workers, to ordinary volunteers and community individuals. The goals of PFA are pragmatic and constructed around practical areas of action (WHO, 2019).

The Action Principles of PFA (WHO, 2016)**.**

First, personnel must ***prepare to learn about the situation, the impact and resources & services available.***

- **LOOK**—check for safety, serious distress reactions urgent basic needs
- **LISTEN**—ask about needs and concerns, listen non-judgmentally without pressuring to talk, comfort, and help in calming down
- **LINK—**connect affected people with available support services, like accurate information, helping to prioritize and solve problems, connecting with loved ones and other social support)

Skills of good communication, both verbal and as well as non-verbal, are essential for PFA. PFA is a time-limited assistance. PFA helpers "enable affected individuals to mobilize their own coping resources to regain control of situations, and to connect with available services and supports that they may need in the course of their recovery. PFA helpers also refer people in need of specialized care to professional health or mental health services" (WHO, 2019).

A **psychological crisis** occurs when an individual perceives an event or change in its environment as significant and threatening has exhausted all coping resources to deal with it, and is unaware or unable to pursue other alternatives and experiences a state of psychological disequilibrium (Caplan, 1964; Smead, 1988; Brenda et al., 1995). Through intervention timely and skillful support is provided to help them cope effectively with the situation in concern and thereby prevent potential harm in future to their physical and/or emotional health (Brenda et al., 1995).

Psychological crisis intervention, to be provided by a mental healthcare team, must be dynamic, adapted to suit different stages of a pandemic, i.e., during and after the outbreak (114). It should simultaneously address 2 major issues, viz.,

- Fear of disease
- Difficulty in adaptation.

During the second phase after the outbreak, APD is an effective method to address the psychological impact of disaster among medical staff. It includes:

- **Anticipate (A)**—involves providing pre-event stress training in the context of high casualties, operational challenges, and compromised safety.
- **Plan (P)**—facilitating development of a "personal resilience plan" for coping with such situations. It includes identifying and anticipating response challenges.
- **Deter (D)**—helps to learn how to monitor one's stress and use the "personal resilience plan" in real intervention response (Fig. 14.3).

The aim is to include technology in the process of intervention, and to integrate intervention in the early phase with rehabilitation in the later phase. Also such models can be jointly developed with other mental health institutions or shared with them to enhance mental health services (Zhang et al., 2020b).

After a public health outbreak, psychosocial support is mainly delivered to the quarantined people and health care workers attending to them. Telemedicine and online interventions to provide psychological intervention and support can be administered by psychologists, social workers, psychiatrists as well as family members to isolated or suspected patients, and close contacts.

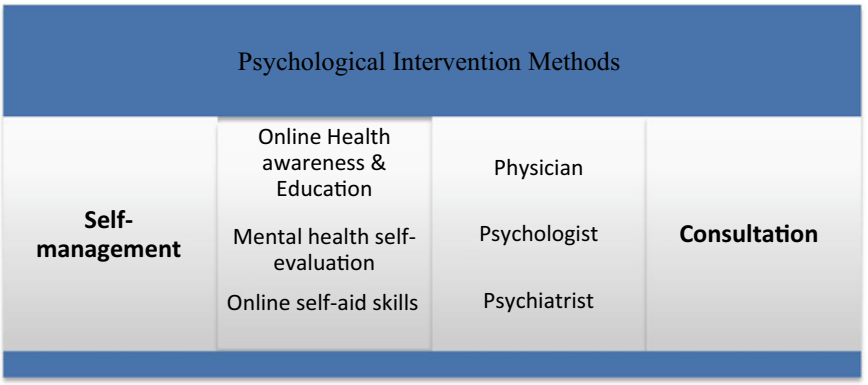

Fig. 14.3 Online psychological intervention for COVID-19 pandemic

Still, certain important concerns remain.

- One of the challenges to psychological crisis intervention is organizing and setting up of an intervention team during lockdown and risks involved to personal health when such services are provided onsite (Zandifar & Badrfam, 2020).
- Further, in developing countries including India, low rate of mental health service utilization, paucity of online mental health services, inaccessibility of digital technology for elderly, or people belonging to low socioeconomic status are some of the additional challenges of online mental health service provision (Yao et al., 2020).
- In India and several other countries, the acute shortage of psychiatrists and other mental health specialists (Andrade et al., 2014; Marr, 2019) can easily overburden the mental health care system with anticipated surge in upcoming demands, posing a threat of global public mental health crisis.
- Few problems with psychological interventions may result from a lack of efficient liaison between medical professionals and psychologists or counselors.

The Way Forward

Stigma and **discrimination** tend to isolate and marginalize particular groups and are major barriers to seeking health interventions as well as the recovery process. Therefore, addressing stigma through awareness, information sharing and training both during the immediate response phase as well as the recovery period will be of utmost importance.

Collaborative efforts with **community and faith-based organizations** may facilitate culturally appropriate mental health planning, preparedness, and response. Such activities should be coordinated with non-government and government organizations (Gierer, 2020).

Digital psychiatry using tele-psychiatry, internet-based computer-aided mental health tools and services, as well as an array of other new technologies, can help globally and urgently during the coronavirus pandemic. Increasing the availability of tele-psychiatric services using smartphones, along with mental health awareness and self-help apps may be a promising way forward, particularly for high risk individuals (Lovejoy, 2019).

In the face of a pandemic/disaster most people are resilient and do not succumb to psychopathology. In fact, some may even find new strengths (Goyal et al., 2020). Majority of people are expected to cope well with such a public health crisis if available resources like information and awareness, shared concern, timely support, connectedness, and solidarity exist. Thus, the COVID-19 crisis can also be reappraised as an opportunity for personal growth, mental health promotion, family bonding, or building relationships by focusing on activities (within one's control) like maintaining hygiene, healthy diet and sleep pattern; exercising, practicing yoga/meditation/mindfulness; engaging in art, music, or recreational activities, exploring new interests and acquiring new hobbies and skills, composing, gardening, cooking, reading, playing games, and journaling personal observations and experiences. These are protective strategies to cope with stress, anxiety, and panic that help to build resilience (Wood & Runger, 2016).

Conclusion

As the COVID-19 pandemic continues to rage, the extent of its psychological, social, and economic fallout needs to be closely monitored. Further, particular influences on such outcomes of a constellation of pre-pandemic, peri-pandemic, and post-pandemic factors, across different countries or regions, must also be noted.

For most people, including patients and health workers, the emotional and behavioral responses to the COVID-19 pandemic situation are part of an adaptive response to extraordinary stress, where psychotherapeutic techniques based on stress-adaptation model could be beneficial (WHO, 2020b; Drosten et al., 2003).

However, in order to reduce the negative psychosocial impact on public mental health (current emotional distress and long-term outcome), a crucial part of the health response of authorities to 2019-nCoV must include: (1) establishment of multidisciplinary mental health teams (including psychiatrists, psychiatric nurses, clinical psychologists, and other mental health professionals; (2) up-to-date communication with reliable data about the situation; and (3) psychological interventions (mostly internet and technology based) for patients and healthcare providers directly involved in the pandemic. In this context, the urgent development and timely implementation of mental health assessment, support, treatment, and services is a pressing need of the hour (Fig. 14.4).

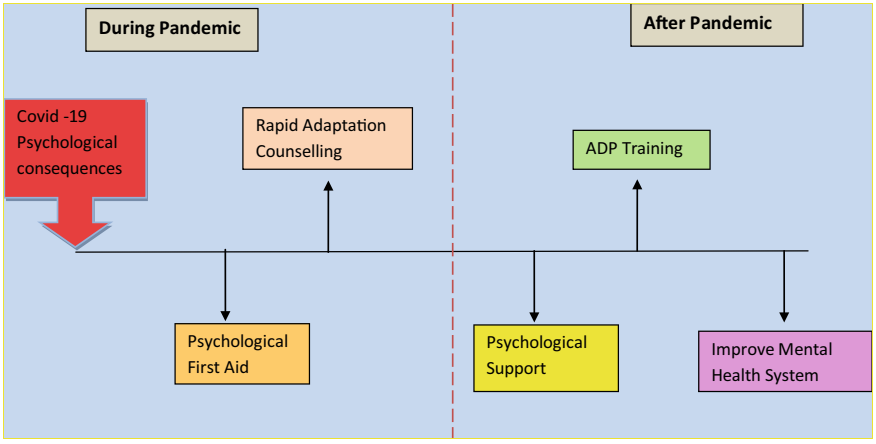

Fig. 14.4 Psychological intervention for pandemic: the two-stage model

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