Chapter

The Impact of COVID-19 Pandemic on Suicidal Behavior

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Abstract

The new type of coronavirus disease (COVID-19), which has affected the whole world and resulted in many people's death, has also had negative effects on mental health. The measures, restrictions, and quarantine practices taken to control the pandemic have caused psychological, social, and economic problems. In studies conducted to date, it has been stated that anxiety symptoms, depression, severe adaptation, and sleep disorders are observed in people who have lost their relatives due to COVID-19, who were treated with the diagnosis of COVID-19, or who were exposed to intense information pollution related to the pandemic. It is also known that a large number of people lost their jobs due to the pandemic, and unemployment rates increased in countries. Economies and health systems of many countries are under this significant burden. In addition to the increase in the incidence of mental symptoms and disorders associated with COVID-19, growing socioeconomic problems pose a risk for suicide. In studies on the subject, attention is drawn to the rate of suicide that will increase during and after the pandemic, and warnings are given about taking precautions. In this section, the effects of COVID-19 on suicidal behavior will be discussed in light of findings in the literature.

Keywords: COVID-19, pandemic, suicidal behavior, risk factors

1. Introduction

The infectious disease caused by the SARS-CoV-2 virus, which first appeared in the city Wuhan in China's Hubei Province, China, in mid-December 2019, affected the whole world in a short time. The infectious disease, which was defined as the novel Coronavirus Disease (COVID-19) by the World Health Organization (WHO) on January 13, 2020, has spread rapidly to 6 continents and hundreds of countries after China [1]. At the time this study was prepared (March 1, 2021), approximately 115 million people were infected all over the world, and more than 2.5 million people died due to COVID-19 [2]. Described as the first pandemic caused by coronaviruses, COVID-19 still continues its devastating effects. Today, it is not known exactly how and for how long the COVID-19 pandemic will continue and how long it will disrupt people's lives. Unforeseen consequences of COVID-19 causing global concern, uncertainty, information pollution (infodemic) about the epidemic in the media, quarantine and isolation procedures can affect people's mental health. Pandemic conditions can cause anxiety, fear, panic, anger, loneliness, guilt, helplessness, and disappointment in people [3]. In addition, the economic problems experienced by many countries during the epidemic period increase the severity of the symptoms. Therefore, COVID-19, which causes massive

trauma, can be considered a risky situation for suicidal behavior. Although the effects of COVID-19 on suicidal behavior have not been fully examined yet, a limited number of studies on the subject draw attention to the approaching "*suicide storm*" [4–6]. Within the scope of suicide prevention programs and interventions during and after the pandemic, it should be aimed to recognize the risk groups beforehand and determine the risk factors. In this section, the effects of COVID-19 on suicidal behavior will be reviewed in light of the literature.

2. Definition and history of suicidal behavior

Suicide is defined as the act of killing oneself. In other words, it is the most tragic event in human life. Suicide, a universal phenomenon as old as human history, is a complex human behavior with biological, psychological, economic, religious, and social aspects. In many anthropological studies, situations related to suicide in primitive tribes have been mentioned. In previous periods, suicide was accepted as a heroic behavior in some societies, and it was sanctified. For example, natural death is found embarrassing, so it was considered an honorable act for the elderly to commit suicide by throwing themselves off a cliff. Today, acceptance of suicide as an honorable behavior, especially in Far Eastern countries, can be regarded as a continuation of this idea [7].

The concept of death has eerie and mysterious features that arouse people's curiosity, to which no human being could remain indifferent throughout the history of mankind. Many religious and philosophical systems have concentrated on the concept of death. Understanding and meaning of death, understanding and meaning of life are in close relationship with each other. The way of perceiving death or its quality directly affects and even determines the perception of life, the feelings, thoughts and behaviors of people, which are the basic elements in the flow of life, and their relationships with other people [8].

Until today, many psychosocial theories have been proposed to explain suicidal behavior [9]. When these theories are examined in general, it is seen that the people who are interested in the subject actually reflect their own perspectives and some of them are very narrow and some of them are very far away from the definition of suicide with very broad explanations. However, while defining suicide in almost all of them, '*human*' has been handled as the most basic element. One of the most important theories about suicide is the socially oriented theory of the French sociologist Emile Durkheim. According to Durkheim, suicide is defined as "every death event that is the direct or indirect result of a positive or negative act done by the deceased person, knowing that it will result in death" [10]. Durkheim cited irregularities in a person's relationship with society as the reason for suicide. As the level of social integration increases in a society, suicide also decreases. Durkheim groups suicides in four main groups. These are: egotistic (selfish), anomic (unregulated), altruistic, and fatal types. Egoistic suicide stems from being withdrawn and insufficient social integration, and not being able to integrate with society to which the individual belongs. In the anomic type, the person cannot keep up with social changes due to changes in life (eg job loss, divorce) or the person is not adequately controlled by social rules. The altruistic type of suicide, on the other hand, is seen in situations where social integration is high, and moral values are strong. The suicide of this type of individual is wanted and accepted by society. For example, a soldier throws himself on a grenade to save his friend or the 'harakiri' seen in Japanese society [10]. Durkheim's theory is successful in explaining suicide rates between different societies and countries. In psychodynamic theories, suicide is defined as "the desire to kill oneself as a result of the individual directing his/her anger towards

others to himself/herself. In these theories focusing on the relationship between suicide and internal factors, suicide was stated as a communication tool, providing help, regret, confession, threat, or revenge method [9].

When it comes to suicide, actions that often result in death come to mind. In fact, it is a correct approach to evaluate suicide as a behavior. With the term "suicidal behavior", a behavioral process that starts with a thought and ends with death is expressed. The National Institute of World Mental Health has identified three basic terms related to suicidal behavior. The first of these is completed suicide. Refers to a person's fatal behavior towards oneself. Suicide attempt defined behaviors that do not result in death but aim to end one's own life. This term encompasses behaviors classified as non-fatal acts such as incomplete suicide, unsuccessful suicide, suicidal statement, and contradictory attempt. It is known that individuals who attempt suicide have tried suicide many times later in their lives. Suicidal ideation, on the other hand, is defined as the person constantly thinking about suicide, making plans in this direction, explicit threats to kill oneself and having a clearly expressed desire to die, but no observable behavior [11].

Until today, the psychosocial aspect of suicidal behavior has been focused on and researched. The neurobiology of suicide is not well known. Studies on the neurobiology of suicide, which has been the focus of researchers' attention especially in recent years, are increasing rapidly. Especially strong evidence has been obtained regarding the role of genetic factors in the emergence of suicidal behavior [12]. It is noteworthy that most of the completed suicides had one or more mental disorders in the pre-death period. The most common psychiatric diagnoses are mood disorders, schizophrenia, and substance use disorders. Mental disorders with the highest risk of suicide are unipolar major depression and bipolar disorder type I and type II [11, 12]. Although it is known that many mental illnesses, especially mood disorders, increase the risk for suicidal behavior, the fact that not every patient with a diagnosis of psychiatric disorder exhibits suicidal behavior indicates that there is a different structural predisposition and genetic tendency for suicidal behavior, which is independent of mental illnesses. In recent years, there is a tendency to evaluate suicidal behavior as a condition independent of mental and physical illnesses. For this reason, "suicide brain" is mentioned in studies on the subject. Attention was drawn to the existence of a relationship between suicidal behavior and aggression and impulsivity. It has been suggested that serotonergic, dopaminergic, glutamatergic, GABAergic system dysfunction, noradrenergic, hypothalamic–pituitary–adrenal axis hyperactivity and microgliosis, anomaly in glial cells and inaccuracy of signaling play a role in the neurobiology of suicide.

Although some findings have been obtained in the limited number of neuroimaging studies examining suicidal behavior, it is not sufficient [13]. As a result, no biomarker related to suicidal behavior has been obtained for today. New studies are needed to better understand the neurobiology of suicide.

3. Epidemiology of suicide

Suicide is an important public health problem that ranks first among the causes of death. Approximately 800,000 people die each year due to suicide in the world. The World Health Organization (WHO) has reported that deaths due to suicide have increased by 60% in the last 50 years. 78% of completed suicides occur in low- and middle-income countries. Suicides account for 1.4% of premature deaths worldwide [14]. Suicide rates differ between regions and countries in terms of age, gender, socio-economic status, method of suicide, and access to health services. Deaths due to suicide rank first among the causes of death in the second and third

decades of life. Completed suicides are 3 times more common in men than in women. On the other hand, suicide attempts are higher in female gender. Likewise, suicide attempts are 30 times more common than suicide. The lifetime prevalence of suicidal ideation in society is between 13.5–35%. Repeated suicide attempts are important predictors of completed suicides. The most common suicide methods are hanging, poisoning with chemicals, and using firearms. Most suicides are associated with psychiatric disorders [15]. Especially depression, alcohol substance use, psychotic disorders carry a high risk for suicidal behavior. In addition, cases with personality disorders, eating disorders, post-traumatic stress disorder are also higher than the general population. Psychosocial risk factors for suicide have been addressed in many studies, and strong evidence has been obtained [14]. However, it may not be possible to evaluate and predict the risk for every suicide case.

4. Suicidal behavior in previous pandemics

An infectious disease affecting the whole world is defined as a pandemic. In order for a disease to be considered a pandemic, it must not have been seen before in society, it must be easily and rapidly transmitted from person to person in different parts of the world and cause devastating consequences. Fatal infectious diseases that threaten social life have been observed throughout human history [16]. Unlike natural disasters or wars affecting a certain geographic region, infectious diseases have affected all humanity without any boundaries, as we have seen in the COVID-19 epidemic, and it has shown its effect wherever people are. There have been 21 pandemics affecting humanity to date [16]. The best known of these is the plague pandemic that emerged in the 14th century. It has been reported that in this pandemic, which has been reported for years, the entire world population has decreased by 1/4 and the population of many important cities has been completely destroyed [17]. Later, Spanish Flu (1918–1920), HIV epidemic, Smallpox in the Former Yugoslavia (1972), severe acute respiratory syndrome (SARS) (2003), "Swine Flu" or H1N1/09 (2009), Middle East Respiratory Syndrome (MERS), Ebola (2014–2016) and ZIKA (2015–2016) pandemics were experienced. These pandemics have resulted in many casualties [18]. There are differences between the first known pandemics and more recent pandemics because during the first pandemics, the population was independent of each other, that is, isolated. However, in today's world where human mobility is increasing, the serious increase in communication and interaction between regions and even intercontinental has changed the course of today's pandemics. In other words, the development of global transportation and communication, and increased contact with different human, animal and ecosystem populations has facilitated the spread of the pandemic. In the studies on previous pandemics, attention has been drawn to the prevalence of psychiatric disorders. Especially during and after the pandemic, mood disorders, anxiety disorders, and sleep disorders are the most frequently reported psychiatric disorders [19]. Increases in suicidal behavior have also been reported due to the increase in psychiatric diseases associated with the pandemic, as well as socio-economic problems [20]. For example, a study reported that suicidal deaths increased in the 1918–1920 flu pandemic in the United States [21]. Similarly, another study reported that during the SARS pandemic in 2003, suicide rates increased in Hong Kong, especially in elderly people [22].

The effects of the COVID-19 pandemic, which we live in and still have an effect all over the world, on suicidal behavior have been discussed in a limited number of studies. However, it is remarkable that in almost all these studies, it is seen that the COVID-19 pandemic can increase suicide rates [23–25]. Although it is accepted

that the pandemic may increase the risk related to suicidal behavior, it is not fully explained how this situation develops. It is important to identify risk factors associated with suicidal behavior that may occur during and after the pandemic, and to develop methods to prevent suicide globally. Only in this way can deaths related to suicide associated with the pandemic be prevented. Researching and learning about past pandemics is necessary to be prepared for a possible future pandemic.

5. Risk factors for suicide associated with COVID-19

In the fight against the pandemic, countries have closed their borders, traveling between and within the country has been restricted, and life has stopped in many areas all over the world. Many factors related to long-term quarantine and isolation procedures, economic, psychosocial, and physical health may be risky situations for suicide. Having social relationships and social support is important in preventing suicide. When suicide attempts or completed suicides are examined, it is determined that individuals' social relations have recently decreased [26]. This situation is also included in suicide theories. The most important health strategy in combating COVID-19 is maintaining a physical distance. Isolation from individuals with a positive test result or suspected COVID-19 from their immediate environment is among the mandatory measures. Also, isolation from people who are hospitalized at home or hospitalized for a long time from their family and relatives because of COVID-19 causes loneliness and inability to share their feelings about the current situation. In other words, restriction of social relationships and quarantine procedures can increase the risk of suicide [27]. For this reason, individuals who stay in quarantine and isolation for a long time should be carefully monitored for suicidal behavior. Access to crowded communities has also been restricted in many countries within the scope of combating COVID-19. Due to these restrictions, people are prevented from coexistence and social sharing. For example, it is prohibited to hold concerts, shows, congresses, and religious ceremonies with large groups of people in many countries. This may be a risk factor for suicidal behavior by increasing the loneliness and social isolation because by being in a group, socialization and a sense of belonging show a protective effect against suicide [28].

With the onset of the COVID-19 pandemic, economic problems began to occur globally. Unemployment rates and financial losses increased in many countries. Millions of people lost income due to the closure of businesses and factories. The early retirement rate increased. Stagnation due to quarantine procedures, loss of workforce caused disruptions in production. The governments of many countries implement a number of financial support programs for impoverished individuals with reduced purchasing power [4]. Loss of job and economic crisis have been proven to be the most important risk factors for suicide in studies conducted to date [29]. It has been reported that economic crises are associated with higher suicide rates compared to the welfare period [30]. Therefore, considering the existing research, it can be said that the unemployment and economic crisis due to COVID-19 pose a significant risk for suicide [4–6].

Suicidal behavior can be seen in physical diseases as well as in psychiatric disorders. Although the relationship between physical diseases and suicidal behavior is not known clearly, the results of the studies conducted so far support the suicidal tendency in physical diseases [31]. Especially in the advanced age group, there may be more than one physical disease, and this may increase the risk of suicide. On the other hand, it is noteworthy that COVID-19 is more fatal in advanced age groups and causes more severe symptoms in individuals with physical diseases [32]. For this reason, measures such as long-term home isolation

and curfew are applied to individuals in the advanced age group in many countries. These restrictions and the fear of getting sick during hospital admissions caused individuals with physical diseases to postpone their applications for health problems. Therefore, especially the treatment and course of chronic diseases have been adversely affected by the pandemic. The high rate of suicide-related deaths in elderly individuals during and after previous pandemics necessitates caution for COVID-19 [33–35].

6. The effects of COVID-19 on mental health

Although general medical complications during the COVID-19 outbreak have been addressed in numerous studies, limited studies have focused on their neuropsychiatric effects. In these studies, it is mentioned that SARS-CoV-2 can directly affect the central nervous system. In addition, knowledge of the indirect effects on mental health in previous pandemics (especially the SARS-CoV-1 epidemic 2002–2003) raises concerns about this issue. Therefore, in studies that evaluate the direct neuropsychiatric results and indirect effects of COVID-19 on mental health, it is recommended to plan psychiatric evaluations during and after the pandemic [36]. In some studies, it has been reported that the initial symptoms of COVID-19 may be neuropsychiatric in nature. Patients may present delirium, cerebrovascular complications, encephalopathy, anosmia, and neuromuscular disorders [37, 38]. On the other hand, patients with a previous psychiatric diagnosis may be more vulnerable to COVID-19 and may be at higher risk for negative consequences. Patients with impaired cognitive abilities related to learning, understanding, and cognitive abilities in the fight against pandemic may have difficulties in protecting themselves or in compliance with procedures of individuals with infected psychiatric diseases [39]. During the COVID-19 epidemic, it has been reported that as a result of the stress that individuals faced, anger, anxiety, insomnia, impulsivity, behavioral changes, and suicidal thoughts increased [27, 36]. It should be kept in mind that patients with subclinical psychiatric symptoms before a pandemic with a massive effect may increase their symptoms and create a risky situation for suicide. Pre-COVID-19, especially in cases with a diagnosis of mood disorder, the symptoms of the disease may be exacerbated the pandemic period. It is important to closely monitor the patients in this group in terms of suicidal behavior during the COVID-19 period.

During the treatment of COVID-19, psychiatric symptoms may aggravate as a result of the discontinuation of psychotropic drugs that patients use due to drug–drug interaction. This situation is risky for suicidal behavior. On the other hand, during the COVID-19 pandemic, due to the increased workload, healthcare institutions primarily planned the regulation of treating infected people and delayed the follow-up and treatment of other patients. This has led to difficulties in accessing mental health services. Failure to carry out regular outpatient clinic examinations, especially in patients with a diagnosis of mental disorder, or not being able to allocate sufficient time for psychiatric emergencies in overcrowded emergency services may negatively affect cases with suicidal ideation or suicide attempt. During the pandemic, clinicians may not be able to adequately evaluate the risk factors related to suicidal behavior of the cases due to different reasons (workload, arrangement of psychiatric inpatient institutions for epidemic treatment). It should not be forgotten that patients with generalized anxiety disorder, post-traumatic stress disorder, sleep disorders, alcohol and substance abuse history, and previous suicide attempts are among the risk groups for suicide during and after the pandemic [40].

7. Social stigma associated with COVID-19

Stigma defined as social rejection affects human life negatively. Stigma is frequently observed in pandemic diseases affecting the whole world and large masses of people. In previous typhus, cholera, and plague pandemics, individuals with the disease are known to be discriminated and stigmatized [41]. The COVID-19 pandemic, which has seriously devastating consequences, causes serious social stigma. Especially for those affected by the disease, their family members, healthcare professionals, Asians are exposed to distinct discrimination and stigmatizing attitudes [41, 42]. After the stigma, people may experience hopelessness, anxiety, fear, loneliness, anger towards themselves and their environment, and harmful behaviors. Individuals exposed to social stigma are in the risk group for psychiatric disorders and suicidal behavior [42] because stigmatized people may give up seeking treatment or leave their current treatment unfinished. Because of the fear of being stigmatized as someone with an infectious disease, individuals at risk may not seek help at all. Other individuals in the community may fear and stay away from those who are stigmatized and may be biased towards those who are stigmatized. This situation can turn into verbal or physical violence against the stigmatized person or group.

Therefore, social stigma associated with COVID-19 can have serious consequences for suicidal behavior. In studies conducted to date, attention has been drawn to suicidal behaviors during the pandemic in studies that stated that they were worried about discrimination and stigmatization by society in patients treated for COVID-19 [43–45]. In these studies, it was stated that the ethnic origins of cases who died as a result of suicide were also effective in stigmatizing COVID-19. Increasing fears and misunderstandings of COVID-19 in communities with low socioeconomic and educational levels may have led to higher xenophobia, discrimination, and stigma. It should be kept in mind that this situation may be an important factor for suicide, especially in minority, immigrant, or asylum seeker communities. With COVID-19, changes have occurred in many areas of life. There are some difficulties regarding postnatal visits, funerals, weddings, and graduation ceremonies. In addition to the sudden, unexpected, and rapid course of the pandemic, unusual death conditions affected the mourning process. Family members who cannot see their relatives for a long time due to the risk of contamination cannot see the body after death, and funeral ceremonies cannot be organized. In addition, due to restrictions, the deceased cannot be buried wherever the family wants, migrating to mass graves, and not being able to visit the graves, reducing the social support that the family will receive after the loss. The concern that the relatives of the deceased may infect the disease may cause family members to be stigmatized by society. Traumatic grief may occur as a result of losses due to COVID-19. Planning interventions to prevent and reduce social stigma is of great importance to avoid from these problems. Having easily accessible help facilities for psychiatric symptoms and disorders in the grief process will prevent suicidal behavior.

8. Risk groups in suicidal behavior associated with COVID-19

Risk groups for suicide have also been reported in previous studies on the subject. It is known that especially the advanced age group is among the risk groups for completed suicide. It has been reported that there is an increase in suicide rates among elderly people after previous pandemics [35]. For this reason, individuals in the advanced age group most affected by the COVID-19 pandemic should

be carefully monitored in terms of suicidal behavior [33, 34]. Other age groups most affected by COVID-19 include children and adolescents. With the onset of the pandemic, the mental health of children and adolescents who had been separated from their school and friends for a long time was affected [46]. Although there are studies reporting that there is no change in suicide rates in children and adolescents during the COVID-19 period, it should be kept in mind that it may be a risk group in terms of suicidal behavior [47]. COVID-19 has affected family relationships. During the long-term quarantine and home isolation procedures, an increase in violent behaviors, especially against women, was observed. Women who have been subjected to domestic violence can be considered in the risk group for suicidal behavior [48–50]. Healthcare workers who are at the forefront of combating COVID-19 all over the world are also in the risk group for suicide. Before the pandemic, healthcare workers with high suicide rates should be carefully monitored in terms of suicidal behavior when compared to other occupational groups [51]. Increasing work intensity, fatigue, insomnia, anxiety of infecting family and relatives, incompatibilities within the team, problems due to long-term use of protective equipment, and witnessing the illness and death of their colleagues can cause stress in healthcare professionals [52, 53]. Many healthcare professionals had to stay in a separate place from their family during the pandemic period. In previous pandemics, it has been reported that mental symptoms were observed at a high rate in healthcare workers, and there was an increase in suicidal thoughts and suicide attempts [54–56]. Therefore, it should be kept in mind that healthcare professionals working in medical services related to COVID-19 carry a risk in terms of suicidal behavior. Suicide prevention programs customized for healthcare professionals should be developed. Another group at risk in terms of suicidal behavior associated with COVID-19 consists of police, soldiers, and prisoners. It is because in recent years, higher suicide rates have been reported in special groups such as police, soldiers, and prisoners than in the general population [57, 58].

The stressful working conditions of soldiers and police officers, the intensity of exposure to trauma, and harsh living conditions for prisoners may be risk factors for suicide. As part of the fight against COVID-19, military and police faced an intense workload of monitoring compliance with planned mandatory restrictions and imposing legal sanctions. For convicts and detainees who have to lead a communal life in prisons, implementation of health strategies related to COVID-19 can be difficult. For example, it may not be possible to provide personal hygiene and maintain physical distance in convicts and detainees who cannot see their relatives due to visiting ban. All these stressful life events require caution in these special groups who are at risk in terms of suicidal behavior during and after the pandemic [59]. In addition, it should be kept in mind that people who work in funeral burials, for whom no risk for suicidal behavior has been identified, may be in a risk group for suicidal behavior. It is because, after the COVID-19 epidemic, many deaths occurred on the same day in many countries, staff working in funeral burials may have become risky for psychological symptoms and suicidal behavior due to stressful working conditions.

9. Transportation to suicide vehicles during COVID-19

Risk factors for suicidal behavior include easy access to suicide vehicles. Especially with the acquisition of firearms, applications, and legal regulations are important in preventing suicide. With the prevention of individual armament in many countries, a decrease in suicide rates has been detected [60, 61]. However, the increase in weapon acquisition and storage rates during the COVID-19 pandemic is

alarming [62, 63]. Especially in the studies conducted on this subject in the United States, attention has been drawn to the increase in deaths due to firearm suicide in young individuals [24, 64]. In another study, it was emphasized that during the COVID-19 period, the rate of purchasing firearms of those with suicidal thoughts increased, and the possibility of using some unsafe firearm storage methods increased [65]. Therefore, future studies should seek to better understand those purchasing firearms during COVID-19 and identify ways to increase safe storage among firearm owners. On the other hand, with the epidemic, many medicines and chemicals may have been stored at home. This may pose a risk for a suicide attempt. For this reason, selling institutions should be alert about the subject. Implementing sales restrictions and tracking systems with legal regulations may be important in protecting individuals at risk for suicide [66].

10. Role of media and Information pollution (infodemia) in suicidal behavior associated with COVID-19

In studies conducted so far, it has been reported that suicide news in the media has negative effects, especially on individuals in the risk group [67]. During the pandemic period, people mostly stayed in communication via social media as part of the social isolation measures. However, there has been an increase in the number of false information and fake news on social media, which can adversely affect the health and life of individuals [68]. The spread of false or inaccurate information about COVID-19 can cause panic and fear in societies. As it can make the fight against the disease difficult, it can also increase stigmatization [69]. Repeated exposure to news about rising deaths every hour around the world can increase epidemic fear and suicidal behavior. For this reason, being sensitive to news about COVID-19 in the media and following the rules of publication ethics can reduce the risk of suicide [70]. One of the most negative consequences of the pandemic is an increase in xenophobia. News in the media may have this effect. The lives of individuals exposed to xenophobia may be adversely affected by this situation [71]. Especially in these days when vaccination studies for COVID-19 start, many people may be dreaming of being able to return to their pre-pandemic lives, traveling abroad, shopping or participating in some sporting and artistic activities. However, we may now need a vaccination passport to carry out all these activities. This may be a new risk factor for stigma and xenophobia. Xenophobia can isolate people and prevent them from receiving social support. Therefore, individuals exposed to xenophobia and mentally intense stress may also be at risk for suicidal behavior [44].

11. Preventing suicide associated with COVID-19

Suicide, which is one of the most important causes of death worldwide, is actually among the preventable causes of death. Many countries try to reduce suicide-related mortality rates by including suicide prevention programs in their health policies. Since the relationship between COVID-19 and suicidal behavior is not fully explained, information on suicide prevention methods is also limited. In studies conducted to date, attention has been drawn to the increased risk of suicidal behavior in people with mental disorders due to the COVID-19 epidemic that has caused devastating consequences all over the world [72–74]. It is unclear how and to what extent this increase will occur in the short or long term [75] because the COVID-19 pandemic is still not controlled in the world, it is difficult to make any

predictions from now on. However, there may be some opportunities to develop suicide prevention programs based on what we have learned and experience from pandemic experiences over the past years. Crises related to pandemic causing mass trauma are risky situations for suicidal behavior. Among the goals targeted for interventions to prevent suicidal behavior, investigation of the causes of suicidal ideation, suicide attempt, and completed suicides during the pandemic period should be included. In order to prevent suicide-related losses during and after the pandemic, the development of suicide prevention methods should be among the urgent needs. The development of universal suicide prevention programs, especially on the economic stresses associated with COVID-19, increased domestic violence, alcohol consumption, isolation, loneliness, mourning, access to suicide tools, and the role of the media, can prevent suicide-related deaths. Also, it is important to provide economic support and job opportunities during and after the epidemic period related to economic loss, unemployment, which are among the most important risk factors for suicidal behavior [75]. One of the most important measures taken regarding the pandemic is the protection of social distance. But what is expressed here is keeping physical distance between people. Therefore, in order to reduce the social isolation, which is one of the important risk factors for suicide, especially in home isolation, quarantine or hospitalized people, it should be supported to maintain meaningful relationships with phone or video. Increasing the use of social media, especially in the risk groups for suicide, may reduce social isolation and create a protective effect for suicide [76]. Increasing access to mental health services, expanding mental health services, establishing crisis hotlines during the COVID-19 pandemic may be effective in preventing suicide [77]. During the pandemic period, hospital admissions decreased due to the fear of disease transmission. In addition, it may not be possible to conduct face-to-face interviews due to postponed examination appointments. On the other hand, it may affect access to mental health services due to the fact that mental health professionals are assigned to clinics related to the pandemic or because of flexible working practices. In the pandemic period, it is important to increase the access of individuals who have acute exacerbations in individuals followed-up due to mental illness and individuals who are victims of domestic violence to mental health services in preventing suicide. Telepsychiatry practices, which are defined as providing mental health services remotely by using technological opportunities, are gaining momentum in many countries with the COVID-19 epidemic. Studies on this subject indicate that telepsychiatry can be used to support individuals at risk of suicide [78, 79]. In the evaluation of patients in quarantine or receiving treatment with a diagnosis of COVID-19, a brief contact (telephone-based assistance) can reduce suicide rates. However, experienced mental health professionals are needed to assess telepsychiatry and suicide risk. Therefore, training of mental health professionals on the subject is important. Telepsychiatry practices and online education programs can play an important role in raising awareness in preventing COVID-19 and suicide. In addition, it is important for primary care physicians to be sensitive to the risk of suicide during the COVID-19 outbreak [80].

In suicide prevention programs, it is important to determine protective factors as well as evaluation of risk factors. It is known that solidarity among people increased after many mass disasters. During the COVID-19 epidemic, people who lived in the same place but did not know each other, communicated, and supported each other by singing songs from the balconies and windows of their houses during house isolation. In this way, the negative effects of social isolation and loneliness are reduced. Pandemic periods can change people's perspective on life. In this way, life can become more precious, and death can be more frightening. Thus, a protective action for suicide can be achieved.

12. Conclusion

As the humanity of the whole world, we are going through times that we have never experienced before. COVID-19 can cause serious sociological, economic, and psychological problems and pose a serious risk for suicidal behavior in the short and long term. It is necessary to establish national suicide prevention groups and support the development of local action plans. In addition to developing national strategies on suicide prevention, international cooperation is needed. Planning and implementation of suicide prevention training can help raise public awareness. Sensitivity, alertness, and caution for suicidal behavior will be lifesaving. Timely and adequate support for those affected by suicide and establishment of crisis centers for people in distress are important. Identifying risk groups and using online applications can be effective in preventing suicide. Having new regulations regarding the diagnosis and treatment of mental illnesses in the provision of healthcare services, well prepared mental health professionals for this difficult period may reduce suicide rates. The results of studies aimed at understanding suicidal behavior associated with COVID-19 will guide the planning of suicide prevention programs.

Acknowledgements

I gratefully commemorate all healthcare professionals who lost their lives due to COVID-19.

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