# Suicide: the impact of Covid-19 on mental health

# Suicidio: el impacto del Covid-19 en la salud mental

***Érika Benítez Camacho****

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## Abstract

Suicide is a serious public health problem in Mexico and the world. The World Health Organization indicates that each year approximately 800 thousand people die by this means. Of multifactorial origin, the risk factors for suicide include biological, psychological, social and cultural elements, with an emphasis on mental disorders and life crises. It is precisely in these two areas that Covid-19 pandemic has had an impact on the general population, on those who have tested positive for this virus and on health personnel. Despite the fact that it is still too early to safely recognize the deep footprint of the pandemic in different areas, and in particular, in self-caused death, it is undeniable that the health crisis has revealed the urgent need to reflect on solidarity, the principle of sociability, subsidiarity and the vulnerability of the human being.

*Keywords:* suicide, mental health, mental disorders, principle of sociability, subsidiarity, vulnerability.

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* Member of the Mexican Psychiatric Association and the Mexican National Academy of Bioethics. School of Psychology, University Anáhuac México, México. E-mail: ebenitez@ anahuac.mx https://orcid.org/0000-0002-8522-7145
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## Introduction

Self-inflicted death, or the act of deliberately taking one's own life, is a complex phenomenon that is difficult to decide from one moment to the next; it is a process associated with emotional crises that result in despair, existential emptiness and a los  solution to them is death. The risk and protection factors for suicide are diverse. In their understanding lies the possibility of designing assertive intervention and prevention strategies, aimed at safeguarding the most valuable thing a human being has, his or her life. This article aims to delve into relevant aspects of suicide and its link with Covid-19.

## 1. Suicide in the world

Suicide is a public health problem, which has increased significantly in our country and in the world. According to the World Health Organization (1, 2), every year around 800 thousand people commit suicide; in other words, every 40 seconds a person in the world dies from this cause. The worldwide suicide rate is 10.6 per 100 thousand inhabitants (13.5 in men and 7.7 in women); however, there are significant differences depending on the economic income of nations, since, despite the fact that 79% of self-inflicted deaths occur in low and middle-income countries, the suicide rate is higher in those with high incomes (rate of 10.5 vs. 11.5 respectively). Prevalence according to sex is also influenced by the economic variable. While in developed countries men commit suicide almost three times more than women, in developing countries 1.5 men die from suicide for every woman (3). These data allow us to identify that, in global terms; men commit suicide more than women do. However, there are some exceptions, such as China, where the suicide rate per 100,000 inhabitants is 10.3 in women and 9.1 in men (4).

In general, in almost all countries of the world, individuals under 15 years of age commit less suicide and those between 15 and 49 years of age commit more. Adults over 70 years old or more are also represented in this group (5). Since 2015, suicide is the second leading cause of death in the world population between 15 and 29 years, after road accidents. In adolescents between 15 and 19 years old, it is the second cause of death in women (after maternal conditions) and the third in men (after deaths from interpersonal violence and traffic accidents) (2).

The methods of suicide depend largely on social and cultural factors, as well as on access to these means. However, globally, hanging is the most common, followed by firearms and voluntary pesticide poisoning (the latter used mostly in rural areas) (1, 3). In Asian countries such as China, Taiwan, Hong Kong and Japan, for example, high jump and carbon monoxide, hydrogen sulfide, and helium gas poisoning are common suicide methods.

## 2. The situation in Mexico

If all the regions established by the World Health Organization are considered, Europe has the highest suicide rate (15.4), and of this, the Eastern Mediterranean region (3.9) has the lowest. America has a rate of 13.2 suicides per 100 thousand inhabitants (14.8 in men and 11.7 in women) (2).

With a rate of 6.1 self-inflicted deaths per 100,000 inhabitants, the presence of suicide in Latin America is low compared to other countries in the world. In this area, Mexico has a rate of 5.1 suicides (8.0 for men and 2.3 for women). The number may seem low; however, two fundamental elements must be considered. The first and most important is that all life is valuable and, secondly, that the numbers have increased alarmingly in recent years. Specifically, in the last 37 years there has been a 976% increase in the presence of suicide in our country (in 2017 there were 6,559 suicides). The

states with the highest suicide rates in Mexico are Chihuahua (11.4), Yucatan (10.2), Aguascalientes (9.6), Campeche (9.1), Colima (8.5), Guanajuato (7.8), Quintana Roo (7.7), Jalisco (7.2), Baja California Sur (7.1) and Sonora (7.1) (6).

Death from this cause follows the world trend, so that it is more frequent in men (80.1% of suicides) than in women (19.9%), which represents a rate of 8.5 suicides per 100,000 men and 2.0 per 100,000 women. In both cases, the main method is hanging, strangulation or suffocation (7).

In Mexico, suicide is the third cause of death in adolescents between 15 and 19 years of age and the fifth in children under 15 years of age (8). Six out of every 10 deaths by suicide occur in people under 30 years of age,[1] mostly women.[2] Specifically, it is noteworthy that when one is 29 years old or younger, female suicides represent a higher percentage in our country. However, as age increases, the number of self-inflicted deaths in men is greater, to the point that in persons 65 years of age or older, the percentage distribution of suicides is 7.7 in men and 2.7 in women (7).

It is substantial to distinguish the factors that intervene in the behavior of this variable, so that not only are developed strategies of suicide prevention according to age and gender separately, but also intervention maneuvers can be articulated, considering the interposition of both elements, without excluding, of course, the presence of other factors contributing to suicidal behavior.

## 3. Risk factors in suicide

The interest in identifying the causes of suicide has given rise to multiple investigations that conclude its multifactorial origin and the combination of cognitive and neurobiological elements associated with stressful and/or traumatic life situations (9).

Factors such as experiences of trauma in childhood and/or adolescence, family dysfunction, fractured family communication,

domestic violence (having lived through it or witnessed it), psychological abuse, physical or sexual violence, bullying, absence of a life project, hopelessness, diminished sense of life, existential emptiness and lack of a social support network are considered to be at risk for suicidal behavior [3] (10-17).

In the areas of genetics and neurobiology, studies have dealt with the gene and protein expression involved in suicidal behavior and serotonin metabolism, the possible identification of specific genes associated with suicidal behavior, and the brain areas linked to emotional processing, real or imagined perception of pain, suicidal ideation, and suicide attempt (18-22).

The mental disorders primarily underlying suicidal behavior are depressive disorders (particularly major depressive disorder), post-traumatic stress disorder, anxiety disorders (including generalized anxiety, social phobia, and panic disorder), substance use disorders, and personality disorders (23-29). These disorders are involved with suicidal behavior not only because of the symptoms of each disorder or even the comorbidity that may exist between two or more mental and/or personality disorders, but also because of the associated difficulty to effectively tolerate stress, frustration or adverse situations, as well as to implement effective social skills and problem-solving strategies.

Specifically, anxiety disorders have been associated with a greater risk of suicide if accompanied by some depressive disorder, since they seem to form a bridge between suicidal ideation and suicide attempt (30, 31). The consumption of substances, including alcohol, is closely related to suicide in all age groups from adolescence onwards (32-34), which is why suicide prevention should include addiction prevention and comprehensive rehabilitation programs.

Although the influence of mental disorders on suicidal behavior is undeniable, it has been emphasized that not all persons who present suicidal ideation, suicide attempts, or even death from self-inflicted damage, have some mental and/or personality disorder

(35). Recent research points out that suicide is more than a mental health problem, since the motivations for carrying out suicide are also linked to social factors and life crises caused by a decrease in social adjustment, affectation of relationships or interpersonal relationships, unemployment and work or financial stress (36, 37).

## 4. Suicide and Covid-19

The introduction of Covid-19 brought with it many more challenges than the disease itself. The pandemic has had implications as serious as the death of nearly one million people worldwide (38). The suffering from the loss of a loved one with the concomitant complications of grieving, the economic crisis and unemployment, mental illnesses that have emerged and been exacerbated by confinement in all age groups, access to the means of causing death (39), which have not yet been restricted despite the recommendations of the World Health Organization, and even the polarity in the manifestations of affection towards health workers.

The imminent impact of the factors associated with Covid-19 with suicide, has generated the alert of specialists around the world. They warn of the probable increase in suicidal behavior during the health crisis (39-45) and even, once it has been controlled, since it is a fact that, despite the predictions that may be generated about the «wave»[4] of mental disorders and suicides caused by confinement, we know little about the real impact that it will have on people's lives.

Although more research is needed, the figures so far indicate an increase in suicidal behavior from December 2019 and January 2020. Suicides linked to the Covid-19 pandemic have been reported in Mexico, and particularly to confinement and its associated elements. During the more than 150 days of social distancing in our country, a greater number of people (a significant percentage of men and young adults) (46) have been identified with suicidal

gestures, in which fortunately, intervention has been achieved. In some cases, the action has been in real time, but in others, it has been possible to carry out psychological first aid and crisis intervention via telephone or through Whatsapp, provided by workers from government agencies or volunteers from clinical and educational institutions. An increase in calls for psychological help has been observed as the months have progressed. Thus, a greater number of calls were received in July 2020 than in March of the same year (47). The requests for psychological support, requested directly by the person who requires it, or by someone close –family or friend– are for feelings of loneliness and isolation, changes in mood, irritability, sadness, stress, fear, anxiety, depression, sleep disorders, addictions, episodes of domestic violence, break-up of relationships, damage to interpersonal relationships, suicidal ideation and suicide attempts (48-51).

With these data, one could say that Covid-19 has had a significant impact on mental health and specifically on self-inflicted death; however, it is worthwhile to delve into each of the factors that could be involved in this association.

One of the main ones recognizes the global economic and labor crisis, which is estimated to be the loss of nearly 25 million jobs, according to the International Labor Organization. If these forecasts come true, working poverty, originally predicted to be 14 million worldwide by 2020, would be between 8.8 and 35 million people (52). Latin America has been more affected than other countries in the Americas, Europe and Asia, with a loss of 18.3% of working hours recorded in the second quarter of 2020, 14% above the global decline in the same; Chile, Brazil, Colombia and Mexico are the most affected countries (53).

In our country, 11.9 million people have been temporarily suspended from work without pay, of which only 42.3% believe they could return to work once the health contingency is over (53). According to the National Institute of Statistics and Geography (INEGI), in nearly 30% of homes a family member lost his or her

job because of the pandemic, and in 65.1% of homes income has decreased (53-57). The figures indicate that those most affected by unemployment are women working in the informal sector (58), including domestic workers, who continue to be vulnerable despite the fact that, by law, they must be incorporated into Social Security.

The economic and labor crisis, without a doubt, entails altered self-concept and self-esteem, exacerbated stress, emotional destabilization and feelings of shame; guilt, frustration and loss that are associated with ideas about death and suicidal gestures. In the world's most intense economic crises, there has been a greater number of suicides in both sexes, but mostly in men (59-62).

Confinement, on the other hand, is experienced differently depending on the variables that accompany it; for example, job and economic stability, the type of housing availability, the number of family members with whom one lives, interpersonal relationships, and physical and mental health.

In some cases, confinement is experienced as social distancing. In others as social isolation. It is in this last area where the emotional and psychological implications are greater, and yet in all cases we observe a greater or lesser tendency to interact to a lesser extent with family and friends. This is sometimes perceived as a decrease in the social support network, a change in the routine, eating and sleeping habits, a greater physical and emotional fatigue, which increases if you are responsible for an older adult, a minor or someone at greater risk of complications from Covid-19. Also a feeling of overload in those who work remotely, as it has been identified that 70% of people work more in the *home office*, with an average of between 9 and 12 working hours per day (63).

Confinement increases the risk of interpersonal problems, mood swings, increased consumption of alcohol and illegal substances, and living with or witnessing domestic violence[5] and sexual abuse, especially towards women and children (64). The increase in stressors goes beyond the defense mechanisms and coping styles that were usually used. These exacerbating the symptoms of those

who already had mental disorders[6] or even generating depression, anxiety, acute stress disorder and post-traumatic stress disorder (64, 65, 68), which together with a feeling of hopelessness and difficulty in projecting oneself into the future, lead to ideation or attempted suicide.

The most vulnerable population consists of older adults and youth (70). Older adults who do not live with their children or a relative have had to experience confinement in solitude, in many cases isolated because, not knowing how to use technological tools satisfactorily, they cannot communicate by this means with their children or grandchildren. In the case of young people, they face high levels of tension due to situations related to their studies. For example, the loss of routine and social relations, the closure of schools, concerns about whether they will have the necessary materials to take classes online or, even, if they will be able to continue their studies or these will be interrupted given the economic situation of their parents, in addition to the anxiety they may experience for the health of their relatives (64, 70, 71).

Children have also seen their emotional health decline, manifesting significant behavioral changes, anxiety or nervousness, irritability expressed in tantrums, agitation or loneliness. It has also been difficult for them to take classes online, alter their routine, stop seeing their schoolmates and spend extra time with their family. The situation becomes more complex if the child has a disability, lives in overcrowded conditions, or is in conditions of greater social vulnerability, such as living or working on the street (64). Another group that has presented important affectations in mental health is those who are in humanitarian or conflict environments, because besides the fact that mental disorders are more frequent in this population (64), with the health crisis, stress has been exacerbated and the possibility of medical and psychological care has diminished.

Grief is an element that has changed during the health crisis. Dealing with the loss of a loved one under ordinary conditions is

painful and complex enough, but doing so during a pandemic is even more. The death of a close person in times of Covid-19, prevents the realization of funeral rites that allow the assimilation of the loss, not being able to organize a community wake or take children old enough to the funeral rites, or to show condolences in a face-to-face way and with physical demonstrations, has been a challenge, which in many occasions has become a pathological mourning.

The situation is even more unintelligible when the person close to you has died from Covid-19, since in most cases it was not possible to say goodbye physically (in the best of cases there can be a goodbye via telephone or video call). The illness and death happened too quickly, so much so that they could not be processed emotionally; one has the feeling that the sick person was left in a stable state and not with his health so diminished as to conclude in death (72), and one experiences the sensation that something more could have been done. This generally leads to the appearance of feelings of guilt and to states of depression and anxiety.

In various countries around the world and in our country, notes have been circulated of patients who have tested positive for Covid-19 or who were suspected of carrying the virus, and who made some kind of suicide gesture (attempted suicide that was successfully contained by security personnel or suicide, generally occurring by throwing oneself off the roof of hospital institutions). The reports indicate that these patients presented previous depression pictures, or that they did not have emotional alterations before the diagnosis, but that now in which they knew that they could have Covid-19 they manifested anxiety crises.

It is common for those who are sick with this virus to feel intense fear and uncertainty because they do not know how they will evolve and if they will die because of the complications of the disease. In other cases, guilt is added because of the probability of having infected someone else, and even trauma if they were close

to a person who died from Covid-19 or, even if this is not the case, if they have been overexposed to news related to the subject.[7]

The isolation required by the disease tends to increase anxiety in patients, so it is important that, as far as possible, they be connected to their families, either by phone or by video call. In the case of minors, the World Health Organization, the European Charter of Children's Rights and the Mexican Group of Pediatric Psychology, among other organisms, indicate that it is essential that their parents accompany hospitalized children, since an inverse measure would contravene the patient's integral well-being (73).

## 5. Suicide and Covid-19 in health care workers

For some years now, the medical profession has been considered one of the professions with the greatest risk of presenting suicidal behavior due to the overload of work, the demands of the job, the tendency to manifest *burn out* syndrome and the difficulties in having adequate means to carry out the requested activities (74). During the pandemic, suicidal ideation and suicide attempts have increased and, unfortunately, so have completed suicides. Among the possible motivations for these events is the requirement, which not only consists of strenuous working hours, but also on many occasions is accompanied by the request to perform tasks other than those of doctors, given the shortage of personnel in hospital institutions.[8]

In addition to poor nutrition and hydration and little rest, health personnel face feelings of frustration and helplessness; fear of infecting family members (and consequently the isolation of the family unit), and the trauma of seeing their colleagues get sick and die, in addition to *burn-out* syndrome and compassion fatigue, which tend to produce symptoms of depression, anxiety, acute stress disorder and post-traumatic stress disorder.

The daily confrontation with the illness and death of the patients is no longer something habitual and becomes an overwhelming situation, particularly when symptoms of defenselessness prevail due to not having enough supplies for the adequate treatment of the patients, but also not having the personal protection equipment (76). According to recent reports, 97,632 health workers have been infected with Covid-19 (42% of infections have occurred in nurses, 27% in doctors and 31% in other workers such as assistants, technicians and cleaning staff). In terms of deaths, Mexico has the highest coronavirus mortality rate among health care workers (77). Additionally, health care personnel in our country have had to face discriminatory acts and verbal, physical and psychological violence. Unlike what has happened in other countries, where health workers are valued for the work they do on a daily basis, in Mexico a sector of the population discriminates against them and is violent because of the apparent fear that they may be transmitters of coronavirus.

Despite the social stigma that still exists about mental illness and the request for psychiatric and psychological care, a large number of health workers have approached institutions, that offer specialized mental health services (79, 80), in order to attend to the psychological conditions that they present, which prevents the chronicity of mental disorders and pays for the prevention of suicidal behavior.

Suicide prevention is for the World Health Organization a categorical imperative for all countries (35). This organization has been emphatic in calling on nations to design strategies that promote mental health, limit access to the means of suicide, decrease risk factors for suicidal behavior, and promote protective factors for suicide. In the current health crisis, the United Nations, the World Health Organization, and the Pan American Health Organization (81, 82) have recognized the important role of national governments in mitigating the adverse effects of the pandemic on all sectors of the population.

## 6. Bioethics and suicide

Suicide is far from ceasing to be a worldwide problem, since the insertion of the individual in society is unquestionable; the one who has ended his life breaks the social fabric and leaves an indelible mark. We can assume that the suffering of those who present some suicidal gesture is elevated and that they surely go through emotional problems and life crises that make them question the meaning of their existence. Recognizing these mourners as persons with intrinsic and inalienable dignity is fundamental, but it is also fundamental to attend to their physical and mental health.

Sickness and death remind us of the fragility of human beings, but in many cases also of the social vulnerability faced by a significant population group due to the poverty in which they find themselves, or because of limited access to health services. In this area, that of integral health, at a global level, but above all in Latin America, and particularly in Mexico, there are relevant deficiencies and disregard for the principle of distributive justice, since many vulnerable groups do not have access to quality care to protect their health.

This is the case of people, who suffer from a mental illness and who lack sufficient economic resources to attend a private psychiatric or psychological consultation. People who do not have access to specialty public care institutions, or who have to abandon their pharmacological treatment because they do not have money to pay for it. Failures in distributive justice also refer to human resources, as mental health doctors in our country are concentrated in Mexico City, Monterrey and Guadalajara, so people who cannot be transferred to those cities are less likely to be treated by a specialist. The lack of mental health care does not only affect the health area, but also the academic, labor and social areas.

Despite this urgent need for mental health care, the resources allocated annually to this sector have suffered an average budget cut of 2.7% worldwide (64). In our country, the budget percentage

of public investment in mental health is much lower than the average of developed countries and even of other nations in Latin America.

The implications for social and community life are high. From this perspective, the responsibility to provide support to those who need it most is not exclusively that of government programs, but also of the members of society themselves, adhering to the principles of sociability and subsidiarity. From the perspective of sociability, all members of a community are committed to collaborating in the pursuit of the good of all; a person is self-realized when he or she favors the realization of the good of others. From the point of view of subsidiarity, society has the responsibility to identify which of its own elements are the promoters of the suicide of one of its members and what actions should be implemented to prevent this type of behavior (84). For example, in the reduction of social stigma, in the support of those who are experiencing significant difficulties during confinement, those who manifest emotional crises, or those who risk their lives for the well-being of the population, such as health personnel.

A person with suicidal behavior experiences the emotional process he or she goes through in loneliness and isolation. As they find themselves in a state of emotional numbness with little possibility of effectively identifying different solutions to their problems, they consider that the only alternative they have is to die. It is in those moments when he needs a social support network; a group of people who, from solidarity, understand his suffering; who, from sociability, promote his well-being, and who, from subsidiarity, recognize that he is a person, who requires psychological attention but who, most probably, is not in conditions to seek it by himself.

## Conclusions

Suicide is a public health problem that has increased alarmingly in Mexico and the world. The Covid-19 pandemic presents even

greater challenges than the disease itself. Confinement has had a great impact on people's lives, in health, economic, labor and social terms. Specifically in the area of mental health, the ravages of confinement are beginning to be seen; however, it is still too early to clearly identify the impact it will have in the short, medium and long term on the development of mental disorders, life crises and suicidal behavior.

Suicide treatment is multimodal. Intervention efforts must focus on effective care of mental disorders; reduction of social stigma; implementation of preventive programs and the creation of practices for the reduction of alcohol and drug consumption; restriction of access to the means of suicide; resolution of severe problems; and reduction of markers of social disadvantage.

It is cardinal to follow up on the mental illnesses, life crises, ideation and suicide attempts, which are occurring in different sectors of the population because of Covid-19. Nevertheless, promoting a sense of community and the relevance of the common good is transcendental because only with respect to the dignity of the person and the understanding of the principles of sociability, subsidiarity and solidarity can human life be safeguarded.

## Bibliographic notes

[1] The states with the highest suicide rates among the population between the ages of 15 and 29 are Guanajuato (15.9), Chihuahua (15.7), Campeche (14.8) and Aguascalientes (14.1).

[2] According to figures from the National Institute of Statistics and Geography, suicides in the 10-14 year age range were 7.6% in women and 2.7% in men; in the 15-19 year age range, 21.8% in women and 15.4 in men, and in the 20-24 year age range, 16.9% in women and 15.4% in men.

[3] Suicidal behavior involves suicidal ideation, which usually stems from ideas about death and can be structured or unstructured; attempted suicide, which can be high or low lethality, and suicide or completed suicide, as is also known. The process of the suicidal behavior can be brief or prolonged, depending on the particular characteristics of each person and their life situation; however, it is important to consider that generally in adolescents and young adults this process is short,

so that a greater risk of presenting a suicide attempt is found close to the antecedent suicidal ideation.
[4] This term has been frequently used in the print media to describe the likely negative mental health and suicidal behavior consequences associated with the Covid-19 pandemic.
[5] Estimates indicate that worldwide, 31 million additional cases of GBV can occur if confinement continues for 6 months or more (64). In Mexico, domestic violence has increased by 120% since the pandemic began (66% physical violence and 22% emotional violence) (66). This is reflected in calls for help made to hotlines on this issue, which show a notable increase over 2019 (67).
[6] In some cases, those already diagnosed with mental disorders have abandoned their treatment due to financial issues or the fear of catching Covid-19 (when they have to go to a doctor's office or hospital institution).
[7] Overexposure to news can alter a person's sleep and emotional stability; that's why it's recommended to consult the news (on TV, radio or social networks) only twice a day and not immediately before sleeping.
[8] In Mexico, doctors at the 20 de Noviembre Hospital of the ISSSTE reported that due to a lack of cleaning staff they were asked to clean their work area once they had finished their work (75).

## Bibliographic references


1. World Health Organization. Suicide. Facts and figures. 2019. [Accessed on August 28, 2020]. Available from: https://www.who.int/es/news-room/fact-sheets/detail/suicide
2. World Health Organization. World Health Statistics data visualizations dashboard. 2019. [Accessed on August 28, 2020]. Available from: http://apps. who.int/gho/data/node.sdg.3-4-viz-2?lang=en
3. World Health Organization. Every 40 seconds a person commits suicide. 2019. [Accessed on August 31, 2020]. Available from: https://www.who.int/es/news-room/detail/09-09-2019-suicide-one-person-dies-every-40-seconds
4. Armstrong M. Suicide rate around the world. *Statista.com.* 2019. [Accessed on August 31, 2020]. Available from: https://www.statista.com/chart/15390/global-suicide-rates/
5. Lee P, Roser M, Ortiz Ospina E. Suicide deaths by age, World. *Our WorldIn Data.org.* 2018. [Accessed on August 31, 2020]. Available from: https://ourworldin data.org/suicide
6. National Institute of Statistics and Geography. Statistics on the World Suicide Prevention Day (national data) Internet]. 2018. [Accessed on August 31, 2020]. Available from: https://www.inegi.org.mx/contenidos/saladeprensa/aproposito/2018/suicidios2018_Nal.pdf https://doi.org/10.4060/ca8614es

7. National Institute of Statistics and Geography. Statistics on World Suicide Prevention Day (national data). 2017. [Accessed on August 31, 2020]. Available from: http://www.inegi.org.mx/saladeprensa/aproposito/2017/suicidios2017_Nal.pdf https://doi.org/10.4060/ca8614es
8. Sánchez Cervantes F, Serrano González RE, Márquez Caraveo M. Suicide in children under 20 years of age. Mexico 1998-2011. *Mental Health*. 2015; 38 (5): 379-389. https://doi.org/10.17711/sm.0185-3325.2015.051
9. Ludwig B, Roy B, Wang QZ, Birur B, Dwivedi Y. The life span model of suicide and Its Neurobiological Foundation. *Frontiers in Neuroscience*. 2017; 11, 74. https://doi.org/10.3389/fnins.2017.00074
10. Jaiswal SV, Faye AD, Gore SP, Shah HR, Kamath RM. Stressful life events, hopelessness, and suicidal intent in patients admitted with attempted suicide in a tertiary care general hospital. *Journal of Postgraduate Medicine*. 2016; 62(2): 102-104. https://doi.org/10.4103/0022-3859.180556
11. Chau K, Kabuth B, Chau N. Gender and family disparities in suicide attempt and role of socioeconomic, school, and health-related difficulties in early adolescence. *Biomed Research International*. 2014; 13. https://doi.org/10.1155/2014/314521
12. Chau K, Kabuth B, Chau N. Association between suicide ideation and attempts and being an immigrant among adolescents, and the role of socioeconomic factors and school, behavior, and health-related difficulties. *International Journal of Environmental Research and Public Health*. 2016; 13(11): 15. https://doi.org/10.3390/ijerph13111070
13. Ruiz Rodríguez A, Rivas Gómez A. Family dysfunction in patients with suicide attempt in the pediatric emergency area. *Public Health of Mexico.* 2017; 59 (3): 209-210. https://doi.org/10.21149/8326
14. Albores Gallo L, Sauceda García JM, Ruiz Velasco S, Roque Santiago E. Bullying and its association with psychiatric disorders in a sample of Mexican students. *Public Health of Mexico*. 2011; 53 (3): 220-227.
15. Bruwer B, Govender R, Bishop M, Williams DR, Stein DJ, Seedat S. Association between childhood adversities and long-term suicide among South Africans based on South African stress and health study: a cross-sectional study. *BMJ Open,* 2017; 4(6): 14. https://doi.org/10.1136/bmjopen-2013-004644
16. Khemiri L, Jokinen J, Runeson B, Jayaram Lindstrom N. The risk of suicide associated with the experience of violence and impulsivity in alcohol-dependent patients. *Scientific Reports.* 2016; 6(11). https://doi.org/10.1038/srep19373
17. Haglund A, Lindh AU, Lysell H, Renberg ES, Jokinen J, Waern M, *et al*. Interpersonal violence and the prediction of the short-term risk of a repeat suicide attempt. *Scientific Reports*. 2016; 6: 8. https://doi.org/10.1038/srep36892
18. Tovilla Zárate CA, González Castro T B, Juárez Rojo I, García SP, Velázquez Sánchez MP, Villar Soto M, *et al.* Study on the genes of the serotonergic system and suicidal behavior: protocol for a case control study in the Mexican population. BMC *Psychiatry*, 2014; 14: 5. https://doi.org/10.1186/1471-244x-14-29

19. Pandey GN, Rizavi HS, Zhang H, Bhaumik R, Ren XG. The expression of the suicide-associated gene SKA2 is decreased in the prefrontal cortex of suicide victims but not in non-suicidal patients. *International Journal of Neuropsychopharmacology.* 2016; 19(8): 10. https://doi.org/10.1093/ijnp/pyw015
20. Niculescu AB, Levey D, Le-Niculescu H, Niculescu E, Kurian SM, Salomon D. Psychiatric blood biomarkers: avoid jumping to premature negative or positive conclusions. *Mol Psychiatry.* 2015; 20(3): 286-288. https://doi.org/10.1038/mp.2014.180
21. Desphande G, Baxi M, Witte T, Robinson JL. A neural basis for the acquired capability for suicide. *Frontiers of Psychiatry.* 2016; 7: 19. Https://doi.org/10.3389/fpsyt.2016.00125
22. Chang BP, Franklin JC, Ribeiro JD, Fox FR, Bentley KH, Kleiman EM, *et al.* Biological risk factors for suicidal behaviors: a meta-analysis. *Translational Psychiatry*. 2016; 6: 8. https://doi.org/10.1038/tp.2016.165
23. Breslau J, Gilman SE, Stein BD, Ruder T, Gmelin T, Miller E. Sex differences in recent first-onset depression in an epidemiological sample of adolescents. *Translational Psychiatry.* 2017; 7: 6. https://doi.org/10.1038/tp.2017.105
24. Ibrahim N, Amit N, Suen MW. Psychological factors as predictors of suicidal ideation among adolescents in Malaysia. *Plos One*. 2014; 9(10): 6. https://doi.org/10.1371/journal.pone.0110670
25. Ibrahim N, Amit N, Suen MW. Psychological factors as predictors of suicidal ideation among adolescents in Malaysia. *Plos One.* 2014; 9(10): 6. https://doi.org/10.1371/journal.pone.0110670
26. Zhang S, Chen JM, Kuang L, Cao J, Zhang H, Ai M, Fang WD, *et al.* Association between abnormal default mode network activity and suicidality in depressed adolescents. *BMC Psychiatry*. 2016; 16: 10. https://doi.org/10.1186/s12888-016-1047-7
27. Borges G, Benjet C, Medina-Mora ME, Orozco R, Familiar I, Nock MK, *et al.* Service use among Mexico City adolescents with suicidality. *Journal of Affective Disorders.* 2010; 120(1-3): 32-39. https://doi.org/10.1016/j.jad.2009.04.008
28. Borges G, Orozco R, Mora MEM. Risk index for attempted suicide in Mexico. *Salud Pública de México.* 2012; 54(6): 595-606. https://doi.org/10.1590/s0036-36342012000600008
29. Paruk S, Karim E. Update on adolescent mental health. Samj *South African Medical Journal.* 2016; 106(6): 23-25. https://doi.org/10.7196/SAMJ.2016.v106i6.10943
30. Strandheim A, Bjerkeset O, Gunnell D, Bjornelv S, Holmen TL, Bentzen N. Risk factors for suicidal thoughts in adolescence-a prospective cohort study: the Young-HUNT study. *BMJ Open*. 2014; 4(8): 8. https://doi.org/10.1136/bmjopen-2014-005867
31. Baca E, Fuensanta A. Risk factors for suicidal behavior associated with depressive and anxiety disorders. *Mental Health*. 2014; 37(5): 373-380. https://doi.org/10.17711/SM.0185-3325.2014.044
32. Arensman E, Bennardi M, Larkin C, Wall A, McAuliffe C, McCarthy J. Suicide among young people and adults in Ireland: Method characteristics, toxicological

analysis and substance abuse histories compared. *Plos One*. 2016; 11(11): 14. https://doi.org/10.1371/journal.pone.0166881
33. Borges G, Benjet C, Orozco R, Medina-Mora ME, Menéndez D. Alcohol, cannabis and other drugs and subsequent suicide ideation and attempt among young Mexicans. *Journal of Psychiatric Research*. 2017; 91: 74-82. https://doi.org/10.1016/j.jpsychires.2017.02.025
34. Ferrari AJ, Norman RE, Freedman G, Baxter AJ, Pirkis JE, Harris, MG*, et al*. The burden attributable to mental and substance use disorders as risk factors for suicide: Findings from the global burden of disease study 2010. *Plos One*. 2014; 9(4): 11. https://doi.org/10.1371/journal.pone.0091936
35. World Health Organization. Suicide prevention, a global imperative. 2014. [Accessed on September 1, 2020]. Available from: https://apps.who.int/iris/bitstream/handle/10665/136083/9789275318508_spa.pdf;jsessionid=F50E2767A011FB080F09C842E189E976?sequence=1
36. Centers for Disease Control and Prevention. Suicide rates are increasing across the U.S. 2018. [Accessed on 1 September 1, 2020]. Available from: https://www.cdc.gov/spanish/mediosdecomunicacion/comunicados/p_vs_suicidio_060718.html https://doi.org/10.4185/rlcs-2018-1283
37. Healy M. Suicides in the United States increase by more than 30%. Los Angeles Times, 2018. [Accessed on September 1, 2020]. Available from: http://www.latimes.com/espanol/vidayestilo/la-es-aumentan-en-mas-de-un-30-los-suicidios-en-estados-unidos-20180607-story.html https://doi.org/10.4272/978-84-9745-562-6.ch2
38. The world. Map of the coronavirus: expansion in numbers of the Covid-19 in the world. 2020. [Accessed on September 7, 2020]. Available from: https://www.elmundo.es/ciencia-y-salud/salud/2020/03/02/5e5cd4ebfc6c83632e8b 4644.html https://doi.org/10.1590/scielopreprints.868
39. Brown S, Shuman DL. Suicide in the time of Covid-19: A perfect storm. *The Journal of Rural Health.* 2020; 1-4. https://doi.org/ 10.1111/jrh.12458
40. Thakur V, Jain A. Covid-19-suicides: A global psychological pandemic. *Brain Behav Immun*. 2020; 88: 952-953. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7177120/ https://doi.org/10.1016/j.bbi.2020.04.062
41. Ribeiro E. Fighting suicide during Covid-19: Lessons from past pandemics and recessions. VOX EU, 2020. [Accessed on September 8, 2020]. Available from: https://voxeu.org/article/fighting-suicide-during-covid-19
42. Sher L. The impact of the Covid-19 pandemic on suicide rates. QJM: *An International Journal of Medicine,* hcaa202. https://doi.org/ 10.1093/qjmed/hcaa202
43. Carey B. Is the pandemic sparking suicide? *The New York Times.* 2020. [Accessed on September 8, 2020]. Available from: https://www.nytimes.com/2020/05/19/health/pandemic-coronavirus-suicide-health.html
44. Bach T. Will suicides rise because of Covid-19? *US News*. 2020. [Accessed on September 8, 2020]. Available from: https://www.usnews.com/news/healthiest-communities/articles/2020-05-22/experts-warn-of-a-surge-of-suicides-tied-to-the-coronavirus-pandemic

45. Reger MA, Stanley IH, Joiner TE. Suicide Mortality and Coronavirus Disease. JAMA *Psychiatry.* 2020. https://doi.org/10.1001/jamapsychiatry.2020.1060
46. Infobae. The number of suicides among young Mexicans during the Covid-19 health emergency increased. *INFOBAE*. 2020. [Accessed on September 7, 2020]. Available from: https://www.infobae.com/america/mexico/2020/08/15/crecio-el-numero-de-suicidios-entre-jovenes-mexicanos-durante-la-emergencia-sanitaria-por-covid-19/ https://doi.org/10.20318/recs.2020.5441
47. Excelsior. Suicide during the Covid-19 pandemic. 2020. [Accessed on September 2, 2020]. Available from: https://www.excelsior.com.mx/nacional/suicidio-durante-la-pandemia-por-covid-19/1397483 https://doi.org/10.22592/ode2020 nespa4
48. Mejía B. Calls to suicide hotlines are increasing because of the coronavirus. Counselors are feeling the pain it is causing. *Los Angeles Times*. 2020. [Accessed on September 8, 2020]. Available from: https://www.latimes.com/espanol/california/articulo/2020-04-05/las-llamadas-a-las-lineas-directas-de-suicidio-estan-aumentando-por-el-coronavirus-los-consejeros-sienten-el-dolor-que-esta-causando https://doi.org/10.1787/888934073626
49. INFOBAE. Psychological support and legal advice for family violence, services most requested in *call* centers to help Covid-19. 2020. [Accessed on September 8, 2020]. Available from: https://www.infobae.com/america/mexico/2020/04/27/apoyo-psicologico-y-asesoria-juridica-por-violencia-familiar-servicios-que-mas-solicitan-en-call-centers-de-ayuda-ante-covid-19 https://doi.org/10.1016/j.psiq.2020.08.001
50. Miranda F. CdMx activates a telephone line to give psychological consultation for coronavirus. *Millennium*. 2020. [Accessed on September 8, 2020]. Available from: https://www.milenio.com/politica/comunidad/coronavirus-cdmx-activa-linea-telefonica-consulta-psicológica.
51. Mexican Institute of Social Security. Due to the Covid-19 health emergency, the IMSS has responded to 1379 calls for mental health care. 2020. [Accessed on September 8, 2020]. Available from: http://www.imss.gob.mx/prensa/archivo/202006/394 https://doi.org/10.1787/9789264288300-12-es
52. AFP. Coronavirus would destroy 25 million jobs worldwide. *Empresas & Management*. 2020. [Accessed on September 7, 2020]. Available from: https://www.estrategiaynegocios.net/lasclavesdeldia/1365035-330/coronavirus-destruir%C3%ADa-25-millones-de-empleos-en-el-mundo https://doi.org/10.30875/08b30766-es
53. Archiniegas Y. OIT: Latin America is the region with the most jobs lost to the pandemic. *France 24*. 2020. [Accessed on September 7, 2020]. Available from: https://www.france24.com/es/20200701-oit-latinoamerica-desempleo-economia-pandemia-covid19 https://doi.org/10.18356/35991e4a-es
54. LatinUs. A total of 15.7 million unemployed in Mexico by Covid-19: INEGI 2020. [Accessed on September 2, 2020]. Available from: https://latinus.us/2020/07/23/suman-15-7-millones-desempleados-mexico-covid19-inegi/

55. EFE. Unemployment challenges the «V» recovery that López Obrador hopes for. *Expansión.* 2020. Available from: https://expansion.mx/economia/2020/06/13/desempleo-desafia-recuperacion-que-espera-amlo https://doi.org/10.32468/be.494
56. González LM. 1 million... 12 million, how many jobs have been lost because of Covid-19? *López-Dóriga Digital.* 2020. Available from: https://lopezdori ga.com/opinion/1-millon-12-millones-cuantos-empleos-se-han-perdido-por-el-covid-19/
57. López Dóriga J. The impact of the pandemic on employment. *El Economista*. 2020. Available from: https://www.eleconomista.com.mx/opinion/El-impacto-de-la-pandemia-en-el-empleo-20200603-0105.html https://doi.org/10.2307/j.ctv6hp3sq.15
58. The Herald of Mexico. Women, the most affected by unemployment during the Covid-19 pandemic. 2020. [Accessed on September 2, 2020]. Available from: https://heraldodemexico.com.mx/pais/desempleo-covid-19-mujeres-pandemia-pobreza-mexico/ https://doi.org/10.22592/ode2020nespa4
59. Iglesias GC, Sáiz PA, Burón P, Sánchez Lasheras F, Jiménez Treviño L, Fernández Artamendi S, *et al.* Suicide, unemployment and economic recession in Spain. *Journal of Psychiatry and Mental Health*. 2017; 1(2), 70-77. https://doi.org/10.1016/j.rpsm.2016.04.005
60. Oyesana M, López Moringo J, Dutta R. Systematic review of suicide in economic recession. *World J Psychiatry*. 2015; 5(2): 243-254. https://doi.org/10.5498/wjp.v5.i2.243
61. Fernandez A. Suicide prevention during an economic crisis. 2016. [Accessed on September 7, 2020]. Available from: https://www.asistenciaalsui cida.org.ar/post/prevención-del-suicidio-durante-una-crisis-económica https://doi.org/10.230/j.ctt1zgwm3k.7
62. Celada FJ, Quiroga A, Mohedano A, Aliaga I, Fernández C, Martin JL. Suicide attempt attended by the emergency services of Castilla-La Mancha and economic crisis. *Scientific Journal of the Spanish Society of Emergency Medicine.* 2018; 30(4). https://doi.org/10.1016/j.oftal.2020.05.001
63. Hernández G. Times of Covid-19, 70% of people work more doing *home office*. Factor Human Capital. *El Economista*. 2020. Available from: https://factorcapital humano.com/mundo-del-trabajo/tiempos-de-covid-19-el-70-de-las-personas-trabaja-mas-haciendo-home-office/2020/05/ https://doi.org/10.12795/e-rips.2020.i01.06
64. United Nations Organization. Policy brief: Covid-19 and the need for action on mental health. 2020. [Accessed on September 7, 2020]. Available from: https://www.un.org/es/coronavirus/articles/servicios-de-salud-mental-respuesta-gobiernos-covid-19 https://doi.org/10.18356/7cc92199-es
65. Risk M. Prolonged confinement may increase the risk of suicide. *Medical Journal.* 2020. [Accessed on September 7, 2020]. Available from: https://gacetamedica.com/investigacion/el-confinamiento-prolongado-puede-aumentar-el-riesgo-de-suicidio/ https://doi.org/10.1016/s1134-2072(10)70290-5
66. Monroy J. SEGOB: domestic violence increased 120% since the emergence of Covid-19. *El Economista.* 2020. [Accessed on September 7, 2020]. Available from: https://www.eleconomista.com.mx/politica/Segob-violencia-intrafamiliar-aumento-

120-desde-la-emergencia-del-Covid-19-20200416-0111.html https://doi.org/10.33210/ca.v9i2.316
67. Ramírez M, Ramírez de Garay. Urgent help: the increase of calls for gender violence in the CdMx. *Mexico Evalúa.* 2020. [Accessed on September 7, 2020]. Available from: https://www.mexicoevalua.org/auxilio-apremiante-el-aumento-de-las-llamadas-por-violencia-de-genero-en-la-cdmx/ https://doi.org/10.2307/j.ctv103xb4t.12
68. Clay RA. Covid-19 and suicide. How the pandemic will affect suicide rates is still unknown, but there is much psychologists can do to mitigate its impact. *American Psychological Association*. 2020. [Accessed on September 2, 2020]; 51(4). Available from: https://www.apa.org/monitor/2020/06/covid-suicide
69. Notimex. Containment measures for Covid-19 will increase depression and suicide rates, WHO estimates. *El Financiero*. 2020. [Accessed on September 7, 2020].
70. Ordaz A. Young and old, the most vulnerable to suicide in a pandemic, warn. *Forbes*. 2020. [Accessed on September 7, 2020]. Available from: https://www.forbes.com.mx/noticias-jovenes-adultos-mayores-vulnerables-suicidio-pandemia/ https://doi.org/10.2307/j.ctt1zgwm3k.5
71. Ciechalski S, Walters S, Kaufman S. College students brace for the «second curve» of Covid-19-its mental health impact. *NBC News*. 2020. [Accessed on September 2, 2020]. Available from: https://www.nbcnews.com/news/us-news/college-students-brace-second-curve-covid-19-its-mental-health-n1238740 https://doi.org/10.1126/science.abc4071
72. Gallo M, Llaca C, Adame MJ. Mourning for Covid-19. *Tooltoys.* 2020. [Accessed on September 7, 2020]. Available from: https://cuidadospaliativos.org/blog/wp-content/uploads/2020/04/Duelo-por-Covid-19.pdf https://doi.org/10.22592/ode2020nespa4
73. Busqueta MF. Parents must accompany their hospitalized children at all times, including by Covid-19. *Fundación Vuela*. 2020. [Accessed on September 8, 2020]. Available from: https://vuela.org/2020/07/06/los-padres-deben-acompanar-a-sus-hijos-hospitalizados-siempre-incluso-por-covid-19/ https://doi.org/10.36576/summa.7787
74. Cano Langreo M, Cicirello Salas S, López López A, Aguilar Vela M. Current framework of suicide and suicidal ideas in health care personnel. *Med. Segur. Trab.* 2014; 60(234): 198-218. https://doi.org/10.4321/S0465-546X2014000100015 https://doi.org/10.4321/s0465-546x2014000100015
75. Drafting of Animal Politics. Due to lack of cleaning staff, Covid hospital employees from ISSSTE are asked to clean their work area. *Animal Policy*. 2020. [Accessed on September 9, 2020]. Available from: https://www.animalpoliti co.com/2020/06/personal-aseo-empleados-hospital-issste-limpiar-area-de-trabajo/ https://doi.org/10.36576/summa.14111
76. Vera R. Tragedy in the health sector: «We die amidst indifference». *Proceso.* 2020. [Accessed on September 9, 2020]. Available from: Retrieved from: https://www. proceso.com.mx/634084/coronavirus-en-mexico-tragedia-en-el-sector-salud-morimos-en-medio-de-la-indiferencia https://doi.org/10.2307/j.ctv16zj hg3.6

77. Associated Press. Mexico leads in health workers killed by Covid-19. *Chicago Tribune*. 2020. [Accessed on September 9, 2020]. Available from: https://www.chicagotribune.com/espanol/sns-es-coronavirus-mexico-lidera-trabajadores-de-salud-muertos-covid-20200903-hfmergrh3nf6bbh3k7nfgindpq-story.html https://doi.org/10.4060/ca8560es
78. Guzmán S. CONAPRED records 213 complaints of discrimination by Covid-19. *El Financiero.* 2020. [Accessed on September 9, 2020]. Available from: https://www.elfinanciero.com.mx/nacional/conapred-registra-213-quejas-por-actos-de-discriminacion-por-covid-19 https://doi.org/10.22592/ode2020nespa4
79. UN News. In view of a possible increase of suicides due to the coronavirus, the UN asks to take measures to take care of mental health. *United Nations.* 2020. [Accessed on September 9, 2020]. Available from: https://news.un.org/es/story/2020/05/1474312 https://doi.org/10.2307/j.ctt22p7gf8.5
80. Youth Integration Centers. Covid-19: impact of the pandemic and comprehensive care of suicide. Caring for the Caregiver. *Government of Mexico*. 2020. [Accessed on September 9, 2020]. Available from: https://www.gob.mx/salud/cij/es/articulos/covid-19-impacto-de-la-pandemia-y-atencion-integral-de-la-salud-cuidar-al-que-cuida?idiom=es https://doi.org/10.1016/j.enfcli.2020.05.006
81. Pan American Health Organization. Web seminar: Suicide prevention in times of Covid-19. 2020. [Accessed on September 9, 2020]. Available from: https://www.paho.org/es/eventos/seminario-web-prevencion-suicidio-tiempos-covid-19 https://doi.org/10.4060/ca8979es
82. Guterres A. Mental health services are an essential part of all government responses to Covid-19. *United Nations.* 2020. [Accessed on September 9, 2020]. Available from: https://www.un.org/es/coronavirus/articles/servicios-de-salud-mental-respuesta-gobiernos-covid-19 https://doi.org/10.35247/buengob_ 29_05
83. Katz G, Lazcano E, Madrigal E. Mental health in the population setting: the utopia of social psychiatry in low-income countries. *Salud Pública de México*. 2017; 59(4): 351-353. https://doi.org/10.21149/8860
84. Sgreccia E. *Manual de Bioética I. Biomedical Foundations and Ethics.* Madrid: Biblioteca de Autores Cristianos, 2009.