Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Preventive Medicine 152 (2021) 106547

Contents lists available at ScienceDirect

Preventive Medicine

journal homepage: www.elsevier.com/locate/ypmed

Suicide prevention in the covid-19 era

Samuel Rothman [a,b,*], Leo Sher [b,c]

[a] Department of Psychiatry, Bronx-Lebanon Hospital Center Special Care Center, 1276 Fulton Ave, The Bronx, NY 10456, USA
[b] Department of Psychiatry, Icahn School of Medicine at Mount Sinai, 1 Gustave L. Levy Place, New York, NY 10029, USA
[c] James J. Peters VA Medical Center, 130 W. Kingsbridge Road, Bronx, NY 10468, USA

ARTICLE INFO

Keywords:
Suicide
Prevention
Covid-19
Mental health

ABSTRACT

The COVID-19 pandemic is affecting the health of people all around the world including mental health as social isolation which has been one of the best infection mitigation efforts is strongly associated with anxiety, depression, self-harm and suicide attempts. These feelings are consistent with past pandemics where there was loss of routine and sociability. Suicidality has been on the rise in the United States and it is within this context that the pandemic has struck. With the risk of suicide being increased, preventative measures need to be implemented at the universal, selective and indicated levels. Universal suicide prevention is needed for the population as a whole regardless of their risk of suicide. Selective prevention is for subgroups at an increased risk and lastly indicated prevention corresponds to people at a very high risk, for example those with recent suicide attempts. Telemedicine, informative and responsible media, as well as monetary help from governments, banks and other major institutions can all help with suicide prevention in these during the pandemic. These resources can broadly help the population at large, but more targeted approaches will be needed for high risk individuals including those with psychiatric diagnoses, COVID-19 survivors, frontline healthcare workers and the elderly. Additionally, those with recent suicide attempts should warrant even more attention.

1. Covid-19 and mental health

The novel 2019 coronavirus (COVID-19) originating in the last weeks 2019 in Wuhan, China has since spread globally affecting people across 189 countries. By October 2020, almost a full calendar year later, the global death toll has surpassed 1 million people with over 38 million individuals being affected (Dong et al., 2020). The ability of the virus to spread at such a rate is linked to the R^0 of 2.2, which dictates that each patient infected with the virus will typically infect two other uninfected people. The virus is easily transmissible by sneezing, coughing which pass it from one individual to the next, even more so in closed spaces lacking proper ventilation. It is viable in aerosols for approximately 3 h duration. The virus has also been found to remain on common surfaces including plastic, cardboard, stainless steel, for up to 72 h, allowing for even more opportunities for infectivity (Qamar, 2020).

Many countries and specific populations have been affected and responded differently over the months that the pandemic has continued (Mueller et al., 2020; Shams et al., 2020; Webb Hooper et al., 2020; Breslau et al., 2021; Daly et al., 2020; Pan et al., 2021; Saraswathi et al., 2020). Countries with significantly older populations were more vulnerable, as higher fatalities have been noted in people over the age of 60, with further increases in age leading to exponential mortality (Mueller et al., 2020). Developed countries have higher per capita testing, and these same countries with higher incomes have higher life expectancy from the virus (Shams et al., 2020). Within the developed countries, minority and underserved populations have typically had worse outcomes and a disproportionate burden of disease. This is thought to be due to higher level of chronic disease and poorer living conditions making social distancing less possible, and public-facing occupations where the same distancing is difficult or even impossible (Webb Hooper et al., 2020).

The mental health effects of the pandemic have been vast, as social isolation which has been one of the best infection mitigation efforts is strongly associated with anxiety, depression, self-harm and suicide attempts (Matthews et al., 2019). Furthermore, a direct effect of the virus might infect the brain or trigger immune responses that affect brain function and mental health (Holmes et al., 2020). There is a growing body of evidence for social and psychological effects of the pandemic and subsequent social distancing. Telephone help services in Australia have noted increased calls from people experiencing anxiety and

* Corresponding author at: 1276 Fulton Ave, The Bronx, NY 10456, USA.
E-mail address: srothman@bronxcare.org (S. Rothman).

https://doi.org/10.1016/j.ypmed.2021.106547
Received 10 November 2020; Received in revised form 15 March 2021; Accepted 1 April 2021
Available online 16 September 2021

loneliness (Smith and Lim, 2020). Their national statistics bureau has also reported 28% of women and 16% of men feeling lonely, while 47% of teenagers surveyed reported anxiety and 24% felt not only isolated, but unsure of where to go for any type of support. This data is consistent with feelings during past pandemics such as H1N1, Ebola and SARS, where the sense of loneliness and isolation has been shown to stem from loss of routine and social contact (Taylor et al., 2008). People report elevated levels of stress, fear, low mood, frustration, irritability and boredom (Smith and Lim, 2020).

Coping with the pandemic reality, social distancing and other infection control procedures has been difficult for people, especially those with mental illness and substance abuse problems. A large online survey was conducted in Austria that showed 37.7% of those surveyed felt a severe psychological impact with 10% stating that they now suffered from severe depression, anxiety or stress (Traunmüller et al., 2020). In the United States during the height of the pandemic between March and May 2020, prescription fentanyl abuse increased by 35% while other illicit substances had excessive increases: 89% for amphetamines, 48% benzodiazepines, 39% opiates and 34% for cocaine. This supports the rationale that in times of crisis, people resort to drugs and alcohol for help, but could also be related to decreases in drug testing during the pandemic (www.medpagestoday.com/meetingcoverage/painweek/88609, n.d.).

How vulnerable individuals are to the psychological distress of the pandemic could be attributable to many different factors including: age, gender, history of mental illness, social support, specific experiences with the virus, length of isolation and exposure to media (Li et al., 2020).

2. Covid-19 and suicide

Suicide is a major public health concern with over 47,000 deaths annually in the United States (Kochanek et al., 2019). A combination of individual, relationships, community and societal factors contribute to the risk of suicide. The most prominent risk factors include previous suicide attempt(s), a family history of suicide, family history of child maltreatment, history of depression, history of alcohol and substance abuse (Mann, 2002). Other main risks included feelings of hopelessness, impulsive/aggressive tendencies, cultural/religious beliefs, barriers to treatment, loss (financial, social, relational), physical illness, easy access to lethal means and unwillingness to seek help (Centers for Disease Control [internet]. Atlanta (GA), 2019). In the last 20 years in the United States there is the highest age-adjusted suicide rate since 1941 (Drapeau and JL, 2020). It is within this era with a high rate of suicide that the COVID-19 pandemic has struck globally, and this virus has affected many of the aforementioned risk factors. It has created a perfect storm of potential mental disorders and suicide.

Social distancing interventions have been implemented and are expected to reduce infections, but with the reduction in human contact comes the potential for adverse outcomes on suicide. Isolation is associated with suicidal thoughts and behaviors, and hospitalized patients are not being allowed visitation, which could increase their suicide risk as well (Reger et al., 2020).

There is economic stress due to cancelled public events, business' being closed and massive layoffs (Bastiampillai et al., 2020). Globally there is a recession which includes deterioration of asset values and loss of savings. Additionally, with so many people working remotely and schools being closed, some parents are not able to work. In the past, economic downturns have been associated with higher rates of suicide (Oyesanya et al., 2015).

Community and religious activities which can be supportive and comforting in stressful times have isolative restrictions during the COVID-19 pandemic. This can lead to a further increase in suicidality. Weekly attendance at religious services has been associated with a 5-fold lower suicide rate compared with those who don't attend (VanderWeele et al., 2016).

Constant news media coverage about the virus, restrictions and death tolls could be an additional stressor for anyone, especially for people with diagnosed mental illness including substance abuse. Media coverage has also reported increases in gun sales as the pandemic continues, which is concerning as firearm ownership, access or unsafe storage are all associated with elevated suicide risk (Mann and Michel, 2016).

All of the restrictions caused by the virus lead to economic stress, social isolation, decreased support in the community, and barriers to treatment. Existing health problems, both mental and physical can be exacerbated, and 24/7 media coverage can be a powerful additional stressor.

There is a growing body of literature looking at longitudinal studies, tracking how mental health has changed from before to during the pandemic. One study from the United States described increased psychological stress in the first 2 months following declaration of a national emergency when compared with previous levels (Breslau et al., 2021). A second study from the United Kingdom examined longitudinal changes in mental health and concluded that the proportion of adults reporting significant mental health problems increased substantially during the pandemic, most pronounced between April and June 2020. The initial declines were most notable for females, young adults and people of a higher socioeconomic status (Daly et al., 2020). A third study from The Netherlands was a longitudinal study of three case-control cohorts where it was found that people without depressive, anxiety or obsessive-compulsive disorders showed a greater increase in symptoms during COVID-19 than did people with prior mental health conditions (Pan et al., 2021). Finally, a prospective longitudinal study from India described negative mental health effects of undergraduate medical students with prevalence and levels of anxiety and stress being increased while depressive symptoms were unaltered (Saraswathi et al., 2020).

With the risk of suicide being increased, preventative measures need to be discussed and implemented at the universal, selective and indicated levels. Universal suicide prevention is for everyone regardless of their risk of suicide. Selective prevention is for subgroups at an increased risk and finally indicated prevention corresponds to people at a very high risk, for example those with a recent suicide attempt (Sher, 2004).

3. Universal suicide prevention interventions during the COVID-19 pandemic

Universal suicide prevention is designed to help the population at large handle increased stress, anxiety, fear and loneliness associated with the COVID-19 pandemic (Sher, 2020a). In addition to those factors, psychological issues that could lead to suicidal thoughts include fear and uncertainty of getting infected, infecting others and the availability of a vaccine or specific treatment (Sher, 2020b). The World Psychiatric Association (WPA) has provided evidence-based suicide prevention strategies focusing on the COVID-19 pandemic (Joseph and Bhandari, 2020). These include, restricting access to lethal methods for suicide such as firearms, pesticides and medication. The goal is to increase awareness for the public about safe storage of these potentially lethal means. Interventions are also needed to reduce harmful effects of alcohol including restricting sales and educating the general public and at-risk groups about the detrimental effects. They also recommend online training programs for raising awareness about mental health and suicide and targeting youth as soon as schools properly reopen. Responsible media reporting is extremely important to avoid sensationalism which can negatively affect mental health and suicide. Financial support to help ensure accessibility to medical and mental health care is essential as well as developing telemedicine services to adequately reach patients (Joseph and Bhandari, 2020).

The World Health Organization (WHO) is a global organization dedicated to universal health care, providing aid in health emergencies and addressing the social determinants of health. Regarding COVID they have published guidelines for initial lockdown strategies, occupational health and safety for healthcare and other works, and information about

safe social distancing and eventual reopening. Regarding suicide, they recommend four key interventions: restricting access to means; working with the media to ensure responsible reporting of suicide; helping young people develop skills to cope with life's pressures; early identification and management of people who are thinking about suicide or who have made a suicide attempt, keeping follow-up contact in the short and longer-term (https://www.who.int/health-topics/suicide#tab=tab_3, n.d.).

The International Association for Suicide Prevention (IASP) is a Non-Governmental Organization concerned with suicide prevention. They have numerous journals, publications and resources dedicated to suicide prevention. Since the start of the pandemic, they have set up a COVID-19 Resource Centre which aims to provide information for those seeking resources related to the pandemic and suicidal behavior, suicidal ideation and self-harm. They are also a part of the International COVID-19 Suicide Prevention Research Collaboration (ICSPRC). This collaboration was formed in response to the impact of the COVID-19 pandemic on suicide and suicidal behavior. It is an international group of suicide prevention researchers from around 30 countries. The aim is to provide collaborative research to help prevent and manage suicide in relation to the pandemic. There is a forum to share research and information as well as webinars, editorials, advice and guidance on responsible publishing in these uncertain times (https://www.iasp.info/COVID-19_suicide_research.php, n.d.).

Other guidelines focus on financial resources being available, ideally by the government, to ensure access to care as well as supportive therapy modalities for those in need. Domains to focus on to improve mental health and decrease suicide risk include monetary stressors; substance/alcohol use; intimate partner violence; issues due to isolation; quarantine, loneliness, fear and bereavement; controlling access to objects which may be used by those with suicidal thoughts; regulation of media and information; dealing with school and college closures; support to jobless persons (Joseph et al., 2020).

Telepsychiatry has become increasingly popular as it can reduce stigma associated with visiting a provider in person and it is both user-friendly and helpful with maintain social distancing to help negate viral spread. This treatment modality, along with helplines are well documented ways to help with mental health crises and increased suicide risk during the pandemic (Lodha and De Sousa, 2020). While this modality has become increasingly helpful, safety concerns have been raised by some clinicians when evaluating remotely and trying to assess suicidality without an in-person evaluation. Studies of risk assessment and monitoring have shown that videoconferencing is as effective as face-to-face assessments (Chakrabarti, 2015).

Economic hardship is an important factor in suicidal ideation during this pandemic and in similar past crises. Policy makers, governments and banks can help with preventative measures by offering assistance including emergency loans, provisional shelter, food and support for those who have lost jobs or have had reduced hours. Resource allocation should be based on the needs of the people (Gunnell et al., 2020).

It must be stated that suicide prevention is different between countries, with developed countries having a more robust infrastructure to address many of the factors. It will be especially difficult in many lower-income and middle-income countries where mental health services are less structured and have less resources (Sher, 2020c). Issues such as substance abuse, domestic violence are often discussed at length with mental health professionals, however in countries where these individuals are scarce it will be more difficult to address. For example, In Mozambique, there is no psychiatric training capacity, and the mental health-care system is still in development (Oquendo et al., 2018). In Africa, of 18 countries who responded to a survey about suicide prevention, only 4 were attempting to implement suicide prevention guidelines nationally, and only 2 countries were even publishing statistics for suicide attempts nationally (Osafo et al., 2020).

Low- and middle-income countries can bolster access by scaling up mental health care and recognizing the potential of digital health to increase access to mental health services (Patel et al., 2018). Another strategy is task shifting—the use of trained lay health workers to deliver health care in non-specialist settings (Patel et al., 2018).

The economy may affect suicide prevention as unemployment is associated with a two- to threefold increased relative risk of death by suicide and spikes in unemployment correspond to surges in suicide rates (Milner et al., 2013). In economies where unemployment surges, especially in the wake of Covid-19, without governmental financial aid, poorer outcomes will likely be seen (Milner et al., 2013). Treatment strategies will have to differ from countries with more resources already in place. The WHO has 6 broad approaches to suicide prevention: the treatment of those with mental disorders; guns possession control; detoxification of domestic gas; detoxification of car emissions; control of toxic substances availability; and a toning down of reports in the press. (https://www.iasp.info/suicide_guidelines.php#approaches, n.d.). Different countries can address these factors according to the nuances of their laws and population. For example, in the United States gun possession and using it as a method for suicide is very different than in other countries, while in India and Sri Lanka, toxic car emissions as a suicide method is much more prevalent (https://www.iasp.info/suicide_guidelines.php#approaches, n.d.).

4. Selective suicide preventive interventions

Individuals at an increased risk for suicide include those with a psychiatric history, persons with significant emotional distress, COVID-19 survivors, frontline healthcare workers and the elderly (Pan et al., 2021; Sher, 2020a). These populations will require active outreach, and those already in treatment may need increased frequency of contact by their doctors which will require telemedicine to help with accessibility (Sher, 2020a). Individuals with pre-existing mental illness and those with significant emotional distress have an increased risk of suicide during the pandemic, as it is already well-established that they have an elevated risk in general (Too et al., 2019). Rural patients will be disproportionally affected as these communities typically experience more stigma regarding mental health, suicide and seeking help (Monteith et al., 2020). Preventative measures will need to include increasing dissemination of public health messaging as well as efforts to destigmatize mental health care and provide information about web-based applications for coping (Monteith et al., 2020).

Gender differences exist in suicide rates as do differences based on age, ethnicity and other variables. From the 2020 CDC report, suicide rates in males were noted to be 3.5–4.5 times higher than for females, with male rates increasing in the last few years, while female rates had not had significant changes. Among females, suicide rates were highest between ages 45–64, while in men it was ages 75 and up (Hedegaard et al., 2020). Men complete suicide more often and their behavior is more related to financial stress, while women make more attempts, and are more likely made in the context of relationships (Tsirigotis et al., 2011).

Some minority populations won't seek out mental health care for fear of deportation. In the United States legislation allows for ER visits for undocumented immigrants, many of them cannot access care from a primary care provider. During the pandemic, this population would be forced to seek care in the emergency setting, despite that being a high-risk place to be exposed to the virus (Rothman et al., 2020).

COVID-19 survivors are at risk of suicide as even just learning about the diagnosis as well as associated fear and anxiety can increase suicide risk. This can further be complicated if the survivors needed time in the intensive care unit (ICU) which increases risk for post-traumatic stress disorder (PTSD), another risk factor in suicide (McGiffin et al., 2016). Furthermore, neurobiological effects of the virus have been documented in as many as 25% of patients leading to symptoms such as headache, dizziness, seizure, ataxia and stroke. Neurological conditions such as ischemic stroke and headache are associated with increased risk of suicide (Asadi-Pooya and Simani, 2020). Hospitalization without

working can lead to economic hardship, as well as medical bills that need to be paid. Financial support for those infected and who are now trying to reenter the workforce can help with decreasing the risk of suicide. Lack of income can have significant effects on emotional vulnerability, and these same people might also face discrimination when trying to re-enter the workforce due to fear of being contagious (Spinelli and Pellino, 2020).

Frontline healthcare workers are also at an increased risk for suicide during the COVID-19 pandemic with reported cases of physician suicides who tested positive or were at risk of contracting the virus in multiple countries. Frontline workers who were taking care of COVID patients were at higher risk of depression, anxiety, insomnia and distress when compared to healthcare workers in other settings (Lai et al., 2020). Prevention efforts in China included more than 600 free counselling hotlines to help with psychological stress and fear of being infected, including eleven that were operational 24 h a day (Que et al., 2020).

Older adults are already at an increased risk for suicide because of factors such as living alone, loneliness, social isolation and medical illnesses especially ones associated with chronic pain (Draper, 2014). In a pandemic environment with social distancing, the elderly are especially vulnerable to suicide because of a now heightened sense of disconnectedness from society, physical distancing, loss of social opportunities and being at a greater risk of anxiety and depression (Santini et al., 2020). Prevention efforts for elderly adults include mobilizing community workers, volunteers to help provide basic social support, groceries and purchase medication as this population is isolated and at high risk for fatal cases of COVID-19 (Yang et al., 2020). Another strategy used by some suicide prevention organizations include telephone, text and webchat avenues that focus on mental health and wellbeing. To promote connectivity, "Connection cards" which are left at the doorsteps of some elderly citizens have helped to provide practical support. These cards provide contact information for volunteers who are willing to talk, listen and help with daily tasks (Wand et al., 2020). At the primary prevention level, conveying necessary information via television about suicide and the virus would be an effective approach. Clinics should review their patient lists and screen for patients who might be more vulnerable to mental illness and suicide (Sher, 2020a). Online services including psychotherapy apps, telehealth conferencing need to be utilized as well. Efforts are needed to assure continuity of care, target loneliness/isolation and mitigate the adverse effects of quarantine (Joseph and Bhandari, 2020).

5. Indicated suicide preventive interventions

An indicated approach is reserved for people at a very high risk for suicide, for example those who have made a recent attempt (Sher, 2004). Individuals with past attempts usually display higher levels of suicidality (Sher et al., 2018) depression and hopelessness and are high risk of being diagnosed with substance abuse, borderline personality and poorer global functioning in the year before their attempt. These individuals are also more likely to be unemployed and have poorer social skills and relational difficulties (Mann and Metts, 2017). Effective preventative measures for these types of patients involve Dialectal Behavioral Therapy (DBT) (Forman et al., 2004). COVID-19 has affected the ability to provide this treatment modality, however, Salaminet. al were able to show that therapy could continue with video-conferencing modalities. Patients' experiences were often predicated on their familiarity with technology before the covid-19 pandemic (Salamin et al., 2020). Some patients had to stop care due to lack of online capabilities either by themselves of the clinicians or due to not having a private space in their homes to properly benefit from therapeutic sessions. 32% of clinicians felt that they wouldn't be able to deliver DBT as effectively without in-person sessions (Lakeman and Crighton, 2020). This highlights the need for more efforts and initiatives being available to help this population who is at very high risk. Adequate follow up, check-ins, medication and suicide safety planning are all necessary for this high-risk population. Suicide planning intervention consists of a written, prioritized list of coping strategies and sources of support that patients can use to alleviate a suicidal crisis (Brodsky et al., 2018).

6. Postvention

Suicide postvention was coined in 1968 at the first conference of the American Association of Suicidology by Edwin Shneidman. He defined it as interventions to address the care of bereaved survivors, caregivers, and health care providers; to destigmatize the tragedy of suicide and to assist with the recovering process; and to serve as tertiary prevention effort to minimize the risk of subsequent suicides due to complicated grief, contagion or unresolved trauma (Shneidman, 1975). In recent years there have been many campaigns to decrease suicide rates, however there are considerably fewer resources, guidelines and even studies looking at managing the aftermath of a completed suicide. Postvention efforts have mainly targeted adolescents or co-workers but there has always been a concern regarding contagion and the fear of increased risk of suicide with these efforts. However, postvention efforts should be seen as proactive to prevent further suicides (Jordan, 2008).

Telehealth has been an important tool for continued psychiatric care during the pandemic, digital strategies could also be of benefit for postvention. Online services for the bereaved could help if going to see a clinician wasn't possible due to clinics being closed, or difficulty adhering to social distancing guidelines. It would be dependent on internet access, and there would be a need for software training for the services to be used properly. One option would be training certain individuals in different communities to be a "champion", then they could disseminate knowledge within different groups of people (Galway et al., 2019). An example provided by Galway et al. explains that if a suicide occurred within a company, one person could then forward the information through workplace email and explain how to utilize the services properly (Galway et al., 2019).

Postvention is also important for clinicians as a patient committing suicide can have an effect on future care. In a 2018 study of 90 psychiatrists, the most common method of postvention was to call the family and friends of the deceased, while some clinicians who experienced a higher number of suicides might use a procedure or a toolkit. A small number even reported attending the funerals (Erlich et al., 2017). While phone calls wouldn't be impacted during the pandemic, attending funerals, or even visiting with families in person would be much more difficult to do.

In the same study it was found that after a patient suicide, most psychiatrists sought some form of support, whether it be reviewing notes, speaking with a colleague, friend or supervisor. The next most common type of support sought after was legal, either with a risk assessment team, or an attorney (Erlich et al., 2017).

7. Conclusion

There is a certain level of risk of suicide death, and it differs between groups of people based on a multitude of factors including those with mental health issues, those with physical illness associated with pain, those with economic hardship and those that are isolated. Each population and their risk factors will likely now be affected in some way by the COVID-19 pandemic. Given the social distancing that is in place to mitigate viral spread, access to resources that help with mental health and suicide prevention is more limited. Telemedicine, informative and responsible media, as well as monetary help from governments, banks and other major institutions can all help with suicide prevention in these uncertain stressful times. These resources can broadly help the population at large, but more targeted approaches will be needed for high risk individuals including those with psychiatric diagnoses, COVID-19 survivors, frontline healthcare workers and the elderly. Additionally, those with recent suicide attempts should warrant even more attention.

To conclude, the suicide-related consequences of the pandemic will

likely vary on countries' public health control efforts, patient demographics, telehealth availability and existing supportive infrastructure. With this in mind, the effects will be worse in resource-poor countries where there are inadequate social support systems (Lancet Psychiatry, 2020).

Conflicts of interest

None.

References

Asadi-Pooya, A.A., Simani, L., 2020. Central nervous system manifestations of COVID-19: a systematic review. J. Neurol. Sci. 413, 116832. https://doi.org/10.1016/j.jns.2020.116832 (Jun 15). Epub 2020 Apr 11. PMID: 32299017; PMCID: PMC7151535.

Bastiampillai, T., Allison, S., Looi, J.C.L., Licinio, J., Wong, M.L., Perry, S.W., 2020. The COVID-19 pandemic and epidemiologic insights from recession-related suicide mortality. Mol. Psychiatry 25 (12), 3445–3447. https://doi.org/10.1038/s41380-020-00875-4 (Dec). Epub 2020 Sep 1. PMID: 32873897; PMCID: PMC7462110.

Breslau, J., Finucane, M.L., Locker, A.R., Baird, M.D., Roth, E.A., Collins, R.L., 2021. A longitudinal study of psychological distress in the United States before and during the COVID-19 pandemic. Prev. Med. 143, 106362. https://doi.org/10.1016/j.ypmed.2020.106362 (Feb). Epub 2020 Dec 31. PMID: 33388325.

Brodsky, B.S., Spruch-Feiner, A., Stanley, B., 2018. The zero suicide model: applying evidence-based suicide prevention practices to clinical care. Front. Psychiatry 9, 33. https://doi.org/10.3389/fpsyt.2018.00033 (Feb 23). PMID: 29527178; PMCID: PMC5829088.

Centers for Disease Control [internet]. Atlanta (GA), 2019. Centers for Disease Control and Prevention; 2019.Violence Prevention: Risk and Protective Factors (September 3). [26 October 2020]. Available from. https://www.cdc.gov/violenceprevention/suicide/riskprotectivefactors.html.

Chakrabarti, S., 2015. Usefulness of telepsychiatry: a critical evaluation of videoconferencing-based approaches. World J. Psychiatry 5 (3), 286–304. https://doi.org/10.5498/wjp.v5.i3.286 (Sep 22). PMID: 26425443; PMCID: PMC4582305.

Daly, M., Sutin, A.R., Robinson, E., 2020. Longitudinal changes in mental health and the COVID-19 pandemic: evidence from the UK Household Longitudinal Study. Psychol. Med. 1–10. https://doi.org/10.1017/S0033291720004432 (Nov 13). Epub ahead of print. PMID: 33183370; PMCID: PMC7737138.

Dong, E., Du, H., Gardner, L., 2020. An interactive web-based dashboard to track COVID-19 in real time. Lancet Infect. Dis. 20 (5), 533–534. https://doi.org/10.1016/S1473-3099(20)30120-1 (May). Epub 2020 Feb 19. Erratum in: Lancet Infect Dis. 2020 Sep; 20(9):e215. PMID: 32087114; PMCID: PMC7159018.

Drapeau, C.W., JL, McIntosh, 2020. U.S.A. Suicide: 2018 Official Final Data. Published 2020. Accessed April, 2020. https://suicidology.org/wp-content/uploads/2020/02/2018datapgsv2_Final.pdf.

Draper, B.M., 2014. Suicidal behaviour and suicide prevention in later life. Maturitas 79 (2), 179–183. https://doi.org/10.1016/j.maturitas.2014.04.003 (Oct). Epub 2014 Apr 13. PMID: 24786686; PMCID: PMC7131116.

Erlich, M.D., Rolin, S.A., Dixon, L.B., Adler, D.A., Oslin, D.W., Levine, B., Berlant, J.L., Goldman, B., Koh, S., First, M.B., Pabbati, C., Siris, S.G., 2017. Why we need to enhance suicide postvention: evaluating a survey of psychiatrists' behaviors after the suicide of a patient. J. Nerv. Ment. Dis. 205 (7), 507–511. https://doi.org/10.1097/NMD.0000000000000682 (Jul). PMID: 28590263; PMCID: PMC5962958.

Forman, E.M., Berk, M.S., Henriques, G.R., Brown, G.K., Beck, A.T., 2004. History of multiple suicide attempts as a behavioral marker of severe psychopathology. Am. J. Psychiatry 161 (3), 437–443. https://doi.org/10.1176/appi.ajp.161.3.437 (Mar). PMID: 14992968.

Galway, K., Forbes, T., Mallon, S., Santin, O., Best, P., Neff, J., Leavey, G., Pitman, A., 2019. Adapting digital social prescribing for suicide bereavement support: the findings of a consultation exercise to explore the acceptability of implementing digital social prescribing within an existing postvention service. Int. J. Environ. Res. Public Health 16 (22), 4561. https://doi.org/10.3390/ijerph16224561 (Nov 18). PMID: 31752170; PMCID: PMC6888585.

Gunnell, D., Appleby, L., Arensman, E., Hawton, K., John, A., Kapur, N., Khan, M., O'Connor, R.C., Pirkis, J., 2020. COVID-19 Suicide Prevention Research Collaboration. Suicide risk and prevention during the COVID-19 pandemic. Lancet Psychiatry 7 (6), 468–471. https://doi.org/10.1016/S2215-0366(20)30171-1 (Jun). Epub 2020 Apr 21. PMID: 32330430; PMCID: PMC7173821.

Hedegaard, H., Curtin, S.C., Warner, M., 2020. Increase in suicide mortality in the United States, 1999–2018. In: NCHS Data Brief, No 362. National Center for Health Statistics, Hyattsville, MD.

Holmes, E.A., O'Connor, R.C., Perry, V.H., Tracey, I., Wessely, S., Arseneault, L., Ballard, C., Christensen, H., Cohen Silver, R., Everall, I., Ford, T., John, A., Kabir, T., King, K., Madan, I., Michie, S., Przybylski, A.K., Shafran, R., Sweeney, A., Worthman, C.M., Yardley, L., Cowan, K., Cope, C., Hotopf, M., Bullmore, E., 2020. Multidisciplinary research priorities for the COVID-19 pandemic: a call for action for mental health science. Lancet Psychiatry 7 (6), 547–560. https://doi.org/10.1016/S2215-0366(20)30168-1 (Jun). Epub 2020 Apr 15. PMID: 32304649; PMCID: PMC7159850.

https://www.iasp.info/COVID-19_suicide_research.php.

https://www.iasp.info/suicide_guidelines.php#approaches.

https://www.who.int/health-topics/suicide#tab=tab_3.

Jordan, J.R., 2008. Bereavement after suicide. Psychiatr. Ann. 38, 679–685.

Joseph, S.J., Bhandari, S.S., 2020. Dealing with the rising tide of suicides during the COVID-19 pandemic: strengthening the pillars of prevention and timely intervention. Int. J. Soc. Psychiatry. https://doi.org/10.1177/0020764020962146 (Sep 26:20764020962146). Epub ahead of print. PMID: 32985312.

Joseph, S.J., Mishra, A., Bhandari, S.S., Dutta, S., 2020. Intimate partner violence during the COVID-19 pandemic in India: from psychiatric and forensic vantage points. Asian J. Psychiatr. 54, 102279. https://doi.org/10.1016/j.ajp.2020.102279 (Jul 16). Epub ahead of print. PMID: 32707512; PMCID: PMC7365082.

Kochanek, K.D., Murphy, S.L., Xu, J., Arias, E., 2019. Deaths: final data for 2017. Natl. Vital Stat. Rep. 68 (9), 1–77 (Jun). PMID: 32501199.

Lai, J., Ma, S., Wang, Y., Cai, Z., Hu, J., Wei, N., Wu, J., Du, H., Chen, T., Li, R., Tan, H., Kang, L., Yao, L., Huang, M., Wang, H., Wang, G., Liu, Z., Hu, S., 2020. Factors associated with mental health outcomes among health care workers exposed to coronavirus disease 2019. JAMA Netw. Open 3 (3), e203976. https://doi.org/10.1001/jamanetworkopen.2020.3976 (Mar 2). PMID: 32202646; PMCID: PMC7090843.

Lakeman, R., Crighton, J., 2020. The impact of social distancing on people with borderline personality disorder: the views of dialectical behavioural therapists. Issues Ment. Health Nurs. 1–7. https://doi.org/10.1080/01612840.2020.1817208 (Sep 15). Epub ahead of print. PMID: 32931341.

Inadequate access to health care: Kola L. Global mental health and COVID-19. Lancet Psychiatry 7 (8), 2020, 655–657. https://doi.org/10.1016/S2215-0366(20)30235-2 (Aug). Epub 2020 Jun 2. PMID: 32502468; PMCID: PMC7266571.

Li, Z., Ge, J., Yang, M., Feng, J., Qiao, M., Jiang, R., Bi, J., Zhan, G., Xu, X., Wang, L., Zhou, Q., Zhou, C., Pan, Y., Liu, S., Zhang, H., Yang, J., Zhu, B., Hu, Y., Hashimoto, K., Jia, Y., Wang, H., Wang, R., Liu, C., Yang, C., 2020. Vicarious traumatization in the general public, members, and non-members of medical teams aiding in COVID-19 control. Brain Behav. Immun. 88, 916–919. https://doi.org/10.1016/j.bbi.2020.03.007 (Aug). Epub 2020 Mar 10. PMID: 32169498; PMCID: PMC7102670.

Lodha, P., De Sousa, A., 2020. Mental health perspectives of COVID-19 and the emerging role of digital mental health and telepsychiatry. Arch. Med. Health Sci. 8, 133–139.

Mann, J.J., 2002. A current perspective of suicide and attempted suicide. Ann. Intern. Med. 136 (4), 302–311. https://doi.org/10.7326/0003-4819-136-4-200202190-00010 (Feb 19). PMID: 11848728.

Mann, J.J., Metts, A.V., 2017. The economy and suicide. Crisis. 38 (3), 141–146. https://doi.org/10.1027/0227-5910/a000487 (May). PMID: 28641492.

Mann, J.J., Michel, C.A., 2016. Prevention of firearm suicide in the United States: what works and what is possible. Am. J. Psychiatry 173 (10), 969–979. https://doi.org/10.1176/appi.ajp.2016.16010069 (Oct 1). Epub 2016 Jul 22. PMID: 27444796.

Matthews, T., Danese, A., Caspi, A., Fisher, H.L., Goldman-Mellor, S., Kepa, A., Moffitt, T. E., Odgers, C.L., Arseneault, L., 2019. Lonely young adults in modern Britain: findings from an epidemiological cohort study. Psychol. Med. 49 (2), 268–277. https://doi.org/10.1017/S0033291718000788 (Jan). Epub 2018 Apr 24. PMID: 29684289; PMCID: PMC6076992.

McGiffin, J.N., Galatzer-Levy, I.R., Bonanno, G.A., 2016. Is the intensive care unit traumatic? What we know and don't know about the intensive care unit and posttraumatic stress responses. Rehabil. Psychol. 61 (2), 120–131. https://doi.org/10.1037/rep0000073 (May). PMID: 27196855.

Milner, A., Page, A., LaMontagne, A.D., 2013. Long-term unemployment and suicide: a systematic review and meta-analysis. PLoS One 8 (1), e51333. https://doi.org/10.1371/journal.pone.0051333. Epub 2013 Jan 16. PMID: 23341881; PMCID: PMC3547020.

Monteith, L.L., Holliday, R., Brown, T.L., Brenner, L.A., Mohatt, N.V., 2020. Preventing suicide in rural communities during the COVID-19 pandemic. J. Rural. Health. https://doi.org/10.1111/jrh.12448 (Apr 13). Epub ahead of print. PMID: 32282968; PMCID: PMC7262063.

Mueller, A.L., McNamara, M.S., Sinclair, D.A., 2020. Why does COVID-19 disproportionately affect older people? Aging (Albany NY) 12 (10), 9959–9981. https://doi.org/10.18632/aging.103344 (May 29). Epub 2020 May 29. PMID: 32470948; PMCID: PMC7288963.

Oquendo, M.A., Duarte, C., Gouveia, L., Mari, J.J., Mello, M.F., Audet, C.M., Pinsky, I., Vermund, S.H., Mocumbi, A.O., Wainberg, M.L., 2018. Building capacity for global mental health research: challenges to balancing clinical and research training. Lancet Psychiatry 5 (8), 612–613. https://doi.org/10.1016/S2215-0366(18)30097-X (Aug). Epub 2018 Apr 5. PMID: 29628365; PMCID: PMC6402326.

Osafo, J., Asante, K.O., Akotia, C.S., 2020. Suicide prevention in the African region. Crisis 41 (Suppl. 1), S53–S71. https://doi.org/10.1027/0227-5910/a000668 (Mar). PMID: 32208755.

Oyesanya, M., Lopez-Morinigo, J., Dutta, R., 2015. Systematic review of suicide in economic recession. World J. Psychiatry 5 (2), 243–254. https://doi.org/10.5498/wjp.v5.i2.243 (Jun 22). PMID: 26110126; PMCID: PMC4473496.

Pan, K.Y., Kok, A.A.L., Eikelenboom, M., Horsfall, M., Jörg, F., Luteijn, R.A., Rhebergen, D., Oppen, P.V., Giltay, E.J., Penninx, B.W.J.H., 2021. The mental health impact of the COVID-19 pandemic on people with and without depressive, anxiety, or obsessive-compulsive disorders: a longitudinal study of three Dutch case-control cohorts. Lancet Psychiatry 8 (2), 121–129. https://doi.org/10.1016/S2215-0366(20)30491-0 (Feb). Epub 2020 Dec 8. Erratum in: Lancet Psychiatry. 2021 Mar;8(3): e11. PMID: 33306975; PMCID: PMC7831806.

Patel, V., Saxena, S., Lund, C., Thornicroft, G., Baingana, F., Bolton, P., Chisholm, D., Collins, P.Y., Cooper, J.L., Eaton, J., Herrman, H., Herzallah, M.M., Huang, Y., Jordans, M.J.D., Kleinman, A., Medina-Mora, M.E., Morgan, E., Niaz, U., Omigbodun, O., Prince, M., Rahman, A., Saraceno, B., Sarkar, B.K., De Silva, M., Singh, I., Stein, D.J., Sunkel, C., UnÜtzer, J., 2018. The Lancet Commission on global

mental health and sustainable development. Lancet 392 (10157), 1553–1598. https://doi.org/10.1016/S0140-6736(18)31612-X (Oct 27). Epub 2018 Oct 9. Erratum in: Lancet. 2018 Oct 27;392(10157):1518. PMID: 30314863.

Qamar, M.A., 2020. COVID-19: a look into the modern age pandemic. Z. Gesundh Wiss. 1–4. https://doi.org/10.1007/s10389-020-01294-z (May 11). Epub ahead of print. PMID: 32395417; PMCID: PMC7213550.

Que, J., Yuan, K., Gong, Y., Meng, S., Bao, Y., Lu, L., 2020. Raising awareness of suicide prevention during the COVID-19 pandemic. Neuropsychopharmacol. Rep. https://doi.org/10.1002/npr2.12141. Epub ahead of print (Oct 6). PMID: 33022901.

Reger, M.A., Stanley, I.H., Joiner, T.E., 2020. Suicide mortality and coronavirus disease 2019-a perfect storm? JAMA Psychiatry. https://doi.org/10.1001/jamapsychiatry.2020.1060 (Apr 10). Epub ahead of print. PMID: 32275300.

Rothman, S., Gunturu, S., Korenis, P., 2020. The mental health impact of the COVID-19 epidemic on immigrants and racial and ethnic minorities. QJM 113 (11), 779–782. https://doi.org/10.1093/qjmed/hcaa203 (Nov 1). PMID: 32591836; PMCID: PMC7337766.

Salamin, V., Rossier, V., Joye, D., Nolde, C., Pierrehumbert, T., Gothuey, I., Guenot, F., 2020. Adaptations de la thérapie comportementale dialectique ambulatoire en période de pandémie COVID-19 et conséquences du confinement sur des patients souffrant d'un état-limite [Adaptations of an outpatient Dialectical Behavioral Therapy during the COVID-19 pandemic and consequences of the confinement on patients with borderline personality disorder]. Ann. Med. Psychol. (Paris). https://doi.org/10.1016/j.amp.2020.08.006 (Aug 20. French). Epub ahead of print. PMID: 32843771; PMCID: PMC7439824.

Santini, Z.I., Jose, P.E., York Cornwell, E., Koyanagi, A., Nielsen, L., Hinrichsen, C., Meilstrup, C., Madsen, K.R., Koushede, V., 2020. Social disconnectedness, perceived isolation, and symptoms of depression and anxiety among older Americans (NSHAP): a longitudinal mediation analysis. Lancet Public Health 5 (1), e62–e70. https://doi.org/10.1016/S2468-2667(19)30230-0 (Jan). PMID: 31910981.

Saraswathi, I., Saikarthik, J., Senthil Kumar, K., Madhan Srinivasan, K., Ardhanaari, M., Gunapriya, R., 2020. Impact of COVID-19 outbreak on the mental health status of undergraduate medical students in a COVID-19 treating medical college: a prospective longitudinal study. PeerJ 8, e10164. https://doi.org/10.7717/peerj.10164 (Oct 16). PMID: 33088628; PMCID: PMC7571415.

Shams, S.A., Haleem, A., Javaid, M., 2020. Analyzing COVID-19 pandemic for unequal distribution of tests, identified cases, deaths, and fatality rates in the top 18 countries. Diabetes Metab. Syndr. 14 (5), 953–961. https://doi.org/10.1016/j.dsx.2020.06.051 (Sep–Oct). Epub 2020 Jun 26. PMID: 32604014; PMCID: PMC7318938.

Sher, L., 2004. Preventing suicide. QJM 97 (10), 677–680. https://doi.org/10.1093/qjmed/hch106 (Oct). PMID: 15367739.

Sher, L., 2020a. The impact of the COVID-19 pandemic on suicide rates. QJM 113 (10), 707–712. https://doi.org/10.1093/qjmed/hcaa202 (Oct 1). PMID: 32539153; PMCID: PMC7313777.

Sher, L., 2020b. COVID-19, anxiety, sleep disturbances and suicide. Sleep Med. 70, 124. https://doi.org/10.1016/j.sleep.2020.04.019 (Jun). Epub 2020 Apr 25. PMID: 32408252; PMCID: PMC7195057.

Sher, L., 2020c. Psychiatric disorders and suicide in the COVID-19 era. QJM 113 (8), 527–528. https://doi.org/10.1093/qjmed/hcaa204 (Aug 1). PMID: 32569376; PMCID: PMC7337853.

Sher, L., Flory, J., Bierer, L., Makotkine, I., Yehuda, R., 2018. Dehydroepiandrosterone and dehydroepiandrosterone sulfate levels in combat veterans with or without a history of suicide attempt. Acta Psychiatr. Scand. 138 (1), 55–61. https://doi.org/10.1111/acps.12897 (Jul). (Epub 2018 May 22).

Shneidman, E., 1975. Postvention: the care of the bereaved. In: Pasnau, R.O. (Ed.), Consultation-liaison Psychiatry: Seminars in PSYCHIATRY. Grune & Stratton, 1. New York, NY, pp. 245–256.

Smith, B.J., Lim, M.H., 2020. How the COVID-19 pandemic is focusing attention on loneliness and social isolation. Public Health Res. Pract. 30 (2), 3022008. https://doi.org/10.17061/phrp3022008 (Jun 30). PMID: 32601651.

Spinelli, A., Pellino, G., 2020. COVID-19 pandemic: perspectives on an unfolding crisis. Br. J. Surg. 107 (7), 785–787. https://doi.org/10.1002/bjs.11627 (Jun). Epub 2020 Mar 23. PMID: 32191340; PMCID: PMC7228411.

Taylor, M.R., Agho, K.E., Stevens, G.J., Raphael, B., 2008. Factors influencing psychological distress during a disease epidemic: data from Australia's first outbreak of equine influenza. BMC Public Health 8, 347. https://doi.org/10.1186/1471-2458-8-347 (Oct 3). PMID: 18831770; PMCID: PMC2571100.

Too, L.S., Spittal, M.J., Bugeja, L., Reifels, L., Butterworth, P., Pirkis, J., 2019. The association between mental disorders and suicide: a systematic review and meta-analysis of record linkage studies. J. Affect. Disord. 259, 302–313. https://doi.org/10.1016/j.jad.2019.08.054 (Dec 1). Epub 2019 Aug 19. PMID: 31450139.

Traunmüller, C., Stefitz, R., Gaisbachgrabner, K., Schwerdtfeger, A., 2020. Psychological correlates of COVID-19 pandemic in the Austrian population. BMC Public Health 20 (1), 1395. https://doi.org/10.1186/s12889-020-09489-5 (Sep 14). PMID: 32928180; PMCID: PMC7487438.

Tsirigotis, K., Gruszczynski, W., Tsirigotis, M., 2011. Gender differentiation in methods of suicide attempts. Med. Sci. Monit. 17 (8), PH65–70. https://doi.org/10.12659/msm.881887 (Aug). PMID: 21804473; PMCID: PMC3539603.

VanderWeele, T.J., Li, S., Tsai, A.C., Kawachi, I., 2016. Association between religious service attendance and lower suicide rates among US women. JAMA Psychiatry 73 (8), 845–851. https://doi.org/10.1001/jamapsychiatry.2016.1243 (Aug 1). PMID: 27367927; PMCID: PMC7228478.

Wand, A.P.F., Zhong, B.L., Chiu, H.F.K., Draper, B., De Leo, D., 2020. COVID-19: the implications for suicide in older adults. Int. Psychogeriatr. 1–6. https://doi.org/10.1017/S1041610220000770 (Apr 30). Epub ahead of print. PMID: 32349837; PMCID: PMC7235297.

Webb Hooper, M., Nápoles, A.M., Pérez-Stable, E.J., 2020. COVID-19 and racial/ethnic disparities. JAMA 323 (24), 2466–2467. https://doi.org/10.1001/jama.2020.8598 (Jun 23). PMID: 32391864.

www.medpagestoday.com/meetingcoverage/painweek/88609.

Yang, Y., Li, W., Zhang, Q., Zhang, L., Cheung, T., Xiang, Y.T., 2020. Mental health services for older adults in China during the COVID-19 outbreak. Lancet Psychiatry 7 (4), e19. https://doi.org/10.1016/S2215-0366(20)30079-1 (Apr). Epub 2020 Feb 19. PMID: 32085843; PMCID: PMC7128970.