Virtual suicide risk assessment: A review of current literature

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Abstract

Background: Approximately 11 people every day die by suicide in Canada. Canadians have self-reported an increase in mental health challenges including suicidal thoughts following the start of the COVID-19 pandemic. With physical distancing measures in place, suicide risk assessments often need to be addressed virtually. Clinical video telehealth (CVT) can be used to conduct a suicide risk assessment and provide ongoing care to high-risk individuals and ultimately prevent the loss of life.

Objectives: To review the literature on the use of CVT for suicide risk assessments, summarize the specific challenges faced by providers conducting these assessments and highlight suggested safety protocols for providers.

Method: An online search pertaining to CVT and suicide risk assessment was performed using PsycINFO and PubMed databases. Titles and abstracts were reviewed and studies demonstrating the feasibility and effectiveness of CVT for suicide risk assessment were summarized. Additional articles discussing challenges from a provider's perspective and safety protocol suggestions were separately reviewed.

Results: A total of 10 articles were included in the review, 6 for feasibility and/or effectiveness of CVT for suicide risk assessment, 3 additional articles summarizing provider challenges, and 1 article specific to safety protocols. Findings were in support of CVT use for high suicide risk individuals. Strong evidence for the equivalency of CVT to in-person care delivery, increasing comfort amongst both providers and patients, and increased access to timely safety plan development are all features supporting virtual suicide risk assessment. Provider challenges include determining appropriateness, effective emergency management, and managing technological failures. In terms of safety, pre-planned guidelines are essential to protect both the patient and provider, particularly in clinically unsupervised settings which were less frequent and less studied before the pandemic.

Conclusion:

Virtual suicide risk assessment via CVT is feasible and effective for those with an elevated suicide risk. Although provider challenges exist, proactively addressing these can reduce provider apprehension, especially for those who are new to CVT use. More rigorous study of CVT that is inclusive of high-risk participants is needed. The available literature suggests that CVT can be effectively used to conduct an initial assessment for suicidal individuals. This is useful for providers as mental health challenges continue to persist and suicide risk assessments are being done virtually.

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Introduction

In March of 2020, the World Health Organization classified COVID-19 as a global pandemic. This has created physical, social, economic, and psychological impacts for everyone, especially those with pre-existing psychiatric disorders, a history of anxiety/depression/substance abuse, or those who have lost loved ones to COVID-19 (Figure 1). In addition, social isolation and provincial lockdowns have further increased intimate partner violence (1) and childhood abuse/neglect (2) which have been associated with suicide attempts (1,2). A Canadian national survey conducted in September 2020 indicates that 40% of Canadians have openly disclosed that their mental health has deteriorated since March 2020: these numbers are higher for those with pre-existing mental health concerns, ages 18-24, Indigenous, and those identifying as LGBTQ2+ (3). Alarmingly, there has been a sharp increase in suicidality with 10% of Canadians experiencing recent thoughts of suicide, up from 2.5% reported in a pre-pandemic survey done in 2016 (3). As a result of the pandemic-associated restrictions, virtual care has moved from an option to a necessity and has become instrumental in allowing the continuity of health care. With rising concerns about mental health, appropriate screening including suicide risk assessments should become a priority given that these behaviors are likely to persist for a long time and peak later than the actual pandemic (4). The move to virtual care requires that these assessments often be conducted remotely, a significant change in the standard of care.

Telehealth, telemedicine, and virtual care defined

The terms telehealth, telemedicine, and virtual care are often used interchangeably despite having slight differences. Telehealth is a broad term that includes "electronic and telecommunication technology to support and promote long-distance clinical care" while telemedicine is focused on the clinical interaction at distant sites between the patient and provider (5). Virtual care is also broad and defined as "any interaction between patients and/or members of their circle of care, occurring remotely, using any forms of communication or information technologies, with the aim of facilitating or maximizing the quality and effectiveness of patient care" (6). This can include the use of secure videoconferencing, electronic messaging, and mobile apps. Videoconferencing, where clinical interviews happen synchronously with video and audio capability is also known as clinical video telehealth (CVT) and is the focus of this literature review. CVT can be used either in a clinic to connect the patient with a provider at a distant location known as a "clinically supervised setting" or to connect with a provider while the patient is in their home, known as a "clinically unsupervised setting" (7). CVT is particularly valuable to allow continuity of care for those who are in remote locations, immunocompromised, self-isolating, or have mobility issues preventing travel. A 2018 survey amongst Canadian adults highlighted widespread interest for virtual care with 63% interested in consulting with their health care providers over email and 41% interested in video visits (8,9).

Suicide in Canada and Manitoba

Approximately 11 people every day and 4,000 every year die by suicide in Canada (10). Prior attempts resulting in survival, family history of suicide, and a history of chronic/mental health disorders are some risk factors as highlighted in Table 1. Suicide is the second leading cause of death among people aged 15-24 worldwide, and for each death by suicide there are 10-20 suicide attempts and 7-10 individuals profoundly affected (10,11). These numbers are likely underestimated due to misclassification of suicides as "deaths of undetermined intent, accidents or unknown cause" under the 10th edition of International Classification of Diseases and Related Health Conditions [ICD-10] (12).

In Manitoba, between 2010-2015, there were 88.2 suicidal deaths (defined as a self-inflicted injury or undetermined intent or accidental poisoning) per 100,000 adults (13). According to a 2017 Canadian article by Butler et al, Manitoba rates of suicide attempts may be increased by the high Indigenous representation in this province, as suicide rates in this population are known to be elevated (14). Across all age groups, death by suicide amongst the Indigenous population in Canada is double compared to the rest of the population (15). This has been attributed to intergenerational exposure to Indian Residential Schools (16-19), increased exposure to mental health issues, substance use (15,20), trauma, and childhood adversity (21).

According to Perlman et al, "Suicide risk assessment is a multifaceted process for learning about a person, recognizing his or her needs and stressors, and working with them to mobilize strengths and supports" (22p2). Studies have shown that approximately 20% of individuals who have died by suicide have interacted with a mental health professional within one month preceding their

death (32). This emphasizes the importance of conducting suicide risk assessments during clinical encounters to notice these behaviours sooner, provide effective treatment, and prevent the loss of life. These assessments create the opportunity to develop a therapeutic relationship between the provider and the individual which is a key component of suicide risk reduction.

This literature review focuses on the use of CVT, a modality that isn't the typical standard of practice, for suicide risk assessment. This is relevant in the context of the recent changes to the delivery of medical care. Assessing and managing suicidality remotely is an important skill for all providers to gain more comfort with as mental health challenges persist and continuous health care access is provided with the use of virtual modalities.

Objectives

1) To review the literature on virtual suicide risk assessments with a focus on CVT, both in clinically supervised and unsupervised settings

2) To summarize challenges faced by providers in conducting virtual suicide risk assessments

3) To identify safety protocols suggested from the literature as guidance for health care providers

Method

Published journal articles were retrieved from the online databases PsychINFO and PubMed and synthesized. The search terms were ("telehealth" OR "telepsych*" OR "telemental health" OR "virtual" OR "videoconferencing") AND "suicid*". Further inclusion criteria included adults, humans, English language and publications from the years 2000-2020 were added. Duplicates

were removed. Titles and abstracts were reviewed and excluded if they did not specifically address suicide in an adult outpatient setting, did not focus on CVT assessment or focused exclusively on virtual monitoring, psychotherapy or other treatments, use of a virtually created providers/patients, or mobile application.

In the initial search, PubMed yielded a total of 147 articles (390 prior to limits) and PyschINFO yielded a total of 63 articles (209 prior to limits). Additional articles pertaining to challenges and protocols were reviewed with search terms "guidelines" OR "management" if not already included. In total, 10 articles were included for review of objectives 1-3, six unique articles were included for objective 1, three for objective 2, and one for objective 3.

Results

Part 1: Review of six studies on feasibility and effectiveness

There is a mix between study types including three case reports, one report of a pilot project, one qualitative semi-structured interview, and one narrative review. All studies were between the years 2004-2020 with five studies conducted in the USA and one study conducted in Canada. Two studies were carried out in clinically supervised settings while the other three were in clinically unsupervised settings. These studies summarize the advantages of visual observation, time/ cost savings, timely safety plan development, and strong evidence for equivalency of CVT to in-person assessments.

Table 1: Feasibility and/or effectiveness of CVT for suicide risk assessment

Article Title, Year, Country	**Setting/ type of study**	**Virtual Modality**	**Notable Study Details**
Telepsychiatry assessment of a mariner expressing suicidal ideation, 2015, USA[23]	-CUS* -Case report (n=1)	Digigone (CVT)	-Visualization encouraged further engagement and observation of nonverbals -Timely psychiatric evaluation with avoidance of lengthy ER wait times
Managing suicidality in home-based telehealth, 2011, USA[24]	-CUS* -Case report (n=1)	Viterion 500 video phone	-Continual observation and communication reduced likelihood to engage in self-injurious behavior -Safety enhanced via CVT as patient-provider contact is significantly higher with telehealth in acute situations
Telepsychiatry: Videoconferencing in the Delivery of Psychiatric Care, 2013, USA[25]	-CSS* -Case report (n=1)	Mobile CVT in clinic	- Travel/cost savings -Increasing comfort with CVT experience -Timely safety plan development
Suddenly Becoming a "Virtual Doctor": Experiences of Psychiatrists Transition to Telemedicine During the COVID-19 Pandemic, 2020, USA[26]	-CUS* Qualitative semi-structured interviews (n=20)	CVT or phone only	-Smooth transition for both patient and provider -Preference for in person care post pandemic -Improved access for underserved populations with logistical challenges
Managing Suicides via videoconferencing in a remote northern community in Canada, 2004[27]	Pilot project CSS* (n=71)	CVT	-CVT provided cost and time savings with effective treatment -No completed suicides during the year of this study (7 the prior year)

Recommendations for Using CVT with Patients at High Risk of Suicide, USA 2019 [28]	Narrative Review	CVT	-Strong evidence for the equivalency of CVT and in-person delivery -Effective for emergent psychiatric patients -Decrease in hospitalization and days of admission -Reduced rehospitalization within 12 months and increased treatment adherence -Absence of evidence suggesting that high suicide risk individuals should be excluded from CVT modality

*CUS: clinically unsupervised setting / CSS: Clinically supervised setting

Part 2: Challenges from a Providers Perspective

Uscher-Pines et al (26) highlight experiences psychiatrists have faced from the transition to virtual care amongst the COVID-19 pandemic. Challenges faced include decreased clinical data for assessment, diminished patient privacy, lack of emotional connections, shorter visits that are less in-depth, and increased distractions in the patient's home setting. Overarching challenges more in keeping with suicide include determining appropriateness, effective management of emergencies, safety (discussed below in part 3), and technological failures.

Appropriateness

The patient must consent and have an interest in CVT and agree to the emergency management protocols Shore and Lu (30) highlight some circumstances including intoxication during session, acute violence, prior suicidal ideation and past attempts, family history of suicide, news that may be more appropriately delivered in person (ie. significant new diagnosis, terminal illness) and untreated substance abuse that interferes with treatment compliance.

Emergency Management

Gilmore et al (29) conducted an online questionnaire regarding the perceived risks of telemedicine use for patients at high risk of suicide from the perspective of 52 mental health professionals. High risk has been defined as persistent suicidal ideation, recent suicide attempt, or ongoing self-injurious behaviours. Amongst the mental health professionals surveyed:

- 30.8% of respondents identified a perceived lack of control over the patient (ie. inability to use physical restraints if needed)
- 17.3% of respondents identified difficulties triaging patients if needed (more difficult to arrange emergency department admission if the patient is not on-site already)

Technological Failures

Shore and Lu (30) indicate that although technological failures may be inevitable, providers should utilize methods to reduce the likelihood of failures and always have a backup method of communication, such as over the telephone. Suggestions include using an ethernet cable with the computer for increased reliability, security and to reduce any potential Wi-Fi disturbances. Providers should make patients aware of this protocol they will follow before such instances are to occur. This can help to avoid any issues of abandonment if a session is disrupted and connectivity cannot be reestablished for an undetermined amount of time. Providers should continue the assessment over the phone and have a designated amount of time for troubleshooting before either calling technical support or involving other mental health services in the community.

Part 3: Safety Protocols for Providers

Luxton et al (31) discuss safety protocols for clinically unsupervised CVT adapted from published guidelines to prioritize patient safety and guide the assessment process. They suggest that during the first session the provider should review local health system regulations, verify patient location, alternate contact information, closest emergency service, and contact for emergency support person (for a missed appointment, crisis, technological failure). The provider should ensure the adequacy of bandwidth and have familiarity with video service and troubleshooting steps. There should be a plan for ensuring confidentiality and safety throughout the virtual assessment. Following a positive suicidal screen, the provider should assess for frequency, intensity, the content of thought/plans, duration of ideation, impulsivity, history of attempts, and risk/protective factors. The provider should integrate this information and compare it to guidelines to determine risk level (none, low, medium, high, etc.) and ensure rationale for responses are documented and provided.

Discussion

Telehealth has been used by providers to assess mental health patients since 1959 (33). Numerous studies have demonstrated accuracy and reproducibility in establishing a diagnosis (33) with increasing maturity over the past decade (34). Telemedicine advocates have stated that future clinical practice will be permanently altered as a result of the pandemic (19). Therefore, providers need to feel comfortable with conducting remote suicide assessments using CVT.

For Objective 1, six studies (23-28) chosen for review of CVT for suicide risk assessment were supported with the use of CVT. Several studies (23,24,25) highlight that CVT is particularly useful to observe visual cues (body/facial distress) and continuous behavioral observation suggests that individuals are less likely to engage in risky or self-injurious behavior (24). A participant from a particular study (25) had no prior medical CVT experience and indicated increasing comfort as the session progressed. Repeated use and exposure of CVT will intuitively allow both providers and patients to achieve increasing comfort and familiarity with this modality. The major advantage of CVT was allowing these individuals to receive immediate care in their remote and rural settings while in overtly suicidal states. There is an additional benefit in these situations as the likelihood of patient contact with providers increases as suicidal individuals are less likely to leave their house and attend a clinic/hospital for treatment (24). Providers therefore have a better opportunity to intervene and assist suicidal patients.

Uscher-Pines et al (26) reported surprising ease and interest for CVT endorsed by a carefully selected pool of 20 psychiatrists. However, it is hard to discern if this interest was genuine or resulting from the pandemic-induced changes and avoidance of public gatherings. Of interest, providers did note a strong preference for a return to in-person assessments once COVID-19 is over. Reasons for this include comfort with certain techniques that required altering for virtual use, the routine act of going to work, and an office for a private and safe space (26). Providers indicated that CVT is particularly useful for "unique circumstances that prevent in-person visits, patients well known to the provider who have since moved, are remote, or for rescheduling appointments" (26). Participants received a generous $100 gift card which could contribute bias in their responses. Additionally, this study was conducted at the beginning of the pandemic and

opinions may have since changed. Tracking provider and patient feedback throughout various stages of the pandemic would be beneficial for future improvements.

The Canadian pilot project (27) provided evidence of the substantial cost-savings benefit of CVT. In additions to costs, this saved time for the patient who was able to return home sooner as they were held in the community jail until cleared by a provider, the provider who could assess the patient without having to fly up north, and the RCMP officer who would have been a flight escort. This was the most recent Canadian article found using the 2 online search databases. Of the 6 studies, this study had the largest sample size with 71 participants using CVT. The use of a clinically supervised setting was advantageous for observation and technological assistance.

Study sample sizes in the reviewed articles ranged from 1-71 which isn't surprising as most participants were in remote or rural areas or at home. Given the nature of suicide itself, many high suicide risk individuals have been excluded from clinical trials (35-37), therefore reducing a large portion of ideal participants to study.

The narrative review (28) suggests the equivalency of CVT and in-person delivery for those at high risk of suicide however, this is mainly based on anecdotal data. The absence of clinical trials in this area raises several issues including the fact that suicidal crises typically occur suddenly and in isolation making pre-planned group studies challenging and that randomized control trials may not be the most appropriate method for studying suicidal individuals to begin with. These individuals have typically been excluded from such trials added to the unethical nature of withholding treatment in a placebo group. Studies have shown that these individuals

benefit from a flexible approach such as with qualitative studies that incorporate the complexity of human experiences and allows for a deeper understanding of emotional responses. Transparency and honest reflection from the provider about data analysis is important to reduce bias in these types of studies.

Mental health care for suicidal patients already faces clinical and professional challenges that are further complicated when this care must be provided through virtual means. It is important to keep in mind that CVT does not apply to all patient encounters and is a modality of care, not treatment itself. Many of these challenges identified in the study by Uscher Pines et al (26) are related to universal challenges faced with CVT that must be addressed to effectively conduct high-risk suicide assessments. Each patient encounter is unique, and the provider ultimately uses their own clinical judgement as to what situations are appropriate for CVT and what they are comfortable with. Providers may be wary of using CVT if they are inexperienced with it or lack experience with technology and require assistance in navigating through telehealth. This can create feelings of discomfort and additional anxiety for providers who are dealing with high suicide risk individuals. As a result, providers may choose to stick with the standard of care (ie. in-person encounters) despite the growing evidence of CVT's utility amidst a crisis.

Familiarity with guidelines for handling CVT emergencies related to suicide is still developing and can serve to support providers doing these remote assessments. Providers should consider the same duty of care as with face-to-face interactions. Even for acute situations, a virtual encounter is beneficial to provide a baseline evaluation, establish the need for immediate hospitalization, and expedite the process (23).

It is important for primary care providers to feel confident in conducting these assessments as suicidal crises can occur in any setting the use of virtual care is only expected to continue. Further training may be beneficial for providers to increase comfort and when to consider drafting safety plans with their patients. It is essential to have pre-planned safety protocols in place for situations where a patient may express intent to harm themselves and/or disconnects from the session. Continency plans can allow for informed clinical decision making which can reduce patient and clinician anxiety, enhance accuracy and reliability of the assessment, and thereby, supports patient safety [27]." With any identified elevation in risk, the provider and patient should work collaboratively to develop a patient-specific safety plan (not during an acute crisis), with a hard copy for referral. The safety plan should focus on one's strengths during times of despair include coping strategies, emergency contacts, and removal of lethal means.

Relevance to the Physician Assistant (PA) profession

Mental health is relevant to all areas of medicine however acute suicidal scenarios can be more challenging to address in a virtual outpatient setting. Given the increase in mental health burdens faced from the pandemic and that one in five individuals interact with a provider before death by suicide, there may be increased strain placed on mental health providers. The utility of a PA as highly skilled health care provider can be useful in conducting initial suicide risk assessments in a variety of outpatient settings such as family medicine or psychiatry. The PA can spend more time with the patient to obtain a detailed history, draft a safety plan, have more prompt follow up and guide further clinical management. Close supervision by the physician is required to ensure appropriate intervention, including the enactment of involuntary assessment when required.

Future Research and Limitations

This study focused solely on CVT use for acute suicidal crises in an outpatient setting. Further examination into the impact of other virtual means on suicide would provide more rich data, such as the use of virtual provider, virtual patients for teaching students, and mobile app usage. This review was limited to studies of adults over 18, excluding ages 15-18 which are inclusive in the range where suicide is the second most common cause of death. The review was not an exhaustive systematic evaluation of the literature but focused on relevant articles addressing CVT and suicide. Limitations in the reviewed studies include small sample sizes, difficulty with ruling out provider bias, and the lack of quantitative data to support the generalizability of results partially due to ongoing challenges in conducting clinical trials with high suicide risk participants.

It is anticipated that more studies will be conducted as this is a highly relevant and recent area of interest. There is a need for more research for managing high-risk suicidality via CVT in Canadian literature with further inclusion of Indigenous populations.

Conclusion

Since COVID-19 started, CVT usage has subsequently increased which has allowed patients to still receive high-quality healthcare provider interaction, especially in a clinically unsupervised setting. This is important as Canadians have openly disclosed a 4-fold increase in suicidal thoughts during the pandemic compared to 2016. Existing research does provide evidence that providers can effectively manage acute suicide emergencies remotely and that many patients

benefit from treatments delivered via CVT. CVT is beneficial to provide a visual assessment, a baseline evaluation, and to establish the need for immediate hospitalization, even with acute situations (23). Addressing perceived challenges from mental health providers and having pre-planned guidelines for safety management can help reduce potential provider apprehension with this new standard of care. Further research that is inclusive of high-risk individuals and uses qualitative methodology would provide more insight. Initial findings are promising for future uses of CVT to conduct a preliminary assessment for high-risk suicidal individuals as mental health challenges continue to persist.

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Tables and Figures

SUICIDE RISK FACTORS	SUICIDE PROTECTIVE FACTORS
• Substance abuse • History of mental health disorders • Traits (hopelessness, impulsivity, perceived burdensomeness, aggression) • Stressful life events • LGBTTQIA • First Nations • Male gender • Family history of suicide • Prior attempts • Loss (relational, financial, social) • Chronic illness • Access to lethal means • Unwillingness to seek help (ie. negative stigma)	• Social supports • Increased self-esteem • Sense of belonging • Stable employment • Problem solving and conflict resolution skills • Resilience • Access to mental health services and a positive attitude toward them • Treatment of substance use disorders

Table 1: Suicide risk/protective factors reproduced from [38, 39]

INCLUSION CRITERIA	EXCLUSION CRITERIA
English language	Focus on the use of a virtually created provider
Published journals between 2004-2020	Focus on mobile applications
Adult participants	Below age 18
Primary focus on CVT	Focus on continuous virtual monitoring of low risk suicidal individuals
Outpatient setting	Inpatient setting
High suicide risk individuals	
In an acute crisis	

Table 2: Inclusion and Exclusion Criteria for Objective 1 Article selection

✓	SAFETY GUIDLINE CHECKLIST
	Confirm appropriateness of a CVT assessment for patient
	Review local system health regulations (for both provider and patient)
	Verify the patient location and alternate contact information
	Verify the closest emergency service and mental health mobile crisis service
	Identify patient supports that can be contacted in an emergency
	Is there additional security on the software to protect patient privacy?
	Assess quality of environment (sound, lighting, background setting etc.)
	Ensure provider familiarity with video platform and troubleshooting steps
	Have an agreed upon method to reconnect with during a technical disruption
	Suicide screening: Assess frequency, intensity, content of thought/plan, duration of ideation, impulsivity, history of attempts, risk and protective factors.
	Determine risk level (low, medium, high)
	Document rationale for risk level
	If there is any risk, plan to work collaboratively with patient to develop a patient specific safety plan focusing on strengths and coping strategies
	If EMS is warranted, maintain virtual connection and ask the patient to call if appropriate, otherwise visually observe while calling yourself or have secondary staff available to virtually assist

Table 3: Safety Guideline Checklist reproduced from [40]

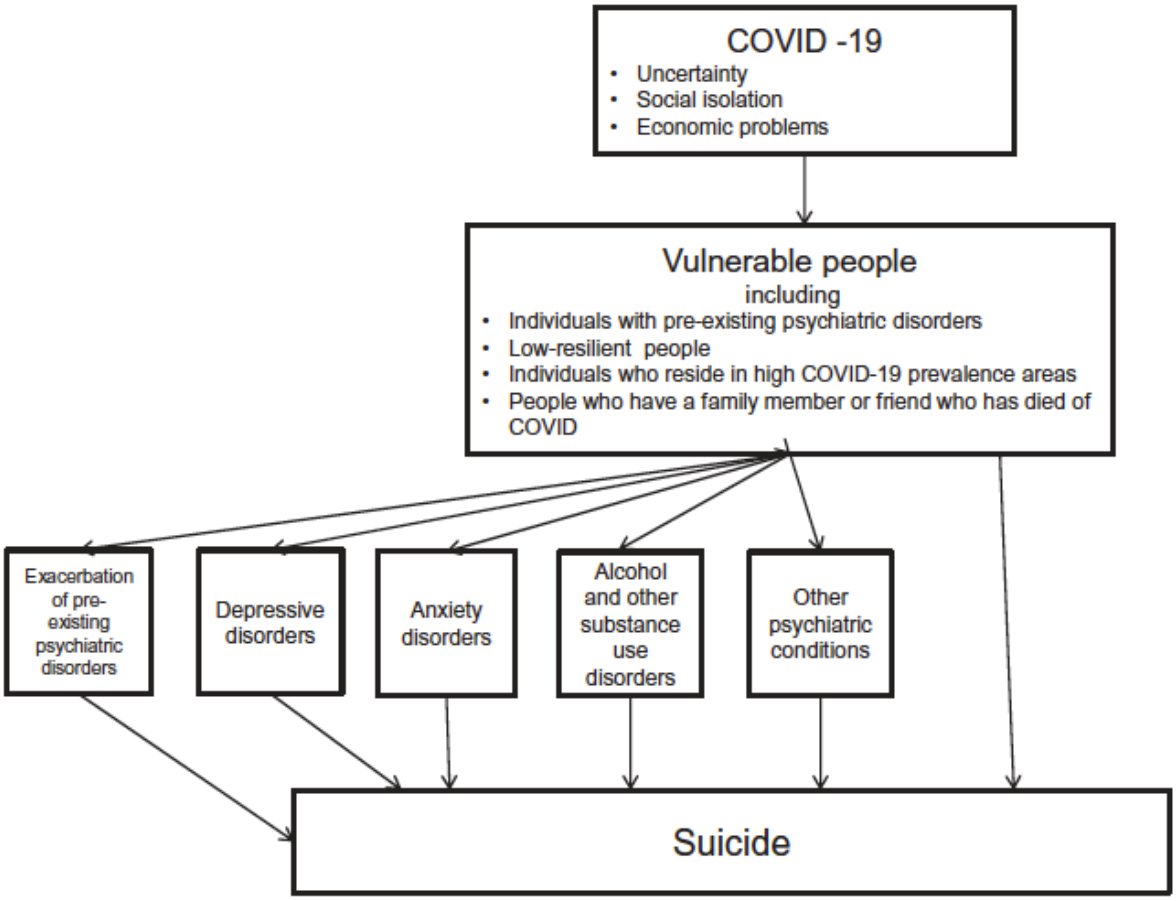

Figure 1. Suicidal behavior in vulnerable populations in the COVID-19 era.

Figure 1: Sher L. The impact of the COVID-19 pandemic on suicide rates [41]