

Suicide: A Complex Phenomenon, Risk Assessment, a Dilemma of Emergency Room Physicians

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Abstract

Worldwide, suicide remains a huge public health and social dilemma resulting in the loss of approximately one million lives each year. It is one of the three leading causes of death among the most economically productive age group, i.e., 15-44 years and the second leading cause among the youth. The greatest burden is borne by the low and middle-income countries, ill-equipped to deal with the mental health issues of their populations. High-income countries replete with resources are also struggling with the issue because of inaccessible services or lack of reinforcement of preventative policies.

This paper summarizes the theoretical bases of suicide to help better understand the motivations of the most vulnerable groups. In addition, it provides an overview of risk factors and assessment tools. Further, it lays down the guidelines for preventative and management strategies. The aim is to assist clinicians in addressing specific underlying causes of suicidal behaviors and developing quick and effective action plans to help those in dire need.

Introduction

Suicide is a complex phenomenon governed by interactions between various factors like neurobiology, stressful events, personal and familial histories, socio-cultural and environmental conditions. Additionally, the global distress of unstable economies has also contributed to the recent increased rates of suicidal ideation and behaviors [1,2]. However, the majority of suicides typically occur in coexistence with psychiatric disorders, stressful events and very challenging medical conditions [3].

The focus of this research paper is to discuss and analyze the existing literature and report on some aspects of this critical phenomenon. This paper examines the pharmacological, neurobiological, and clinical basis of suicide with the purpose of reporting prevalence, theoretical basis, risk factors, prevention strategies, and management. It aims to provide a critical assessment of the available research in an effort to assist clinicians that encounter suicidal patients on a daily basis.

Suicide is a perplexing health challenge with statistics to prove its rising incidence. One million people across the world die each year by suicide. Ten times as many people attempt suicide every year [4,5]. It has been postulated that this rise in incidence could be due to better control of other causes of deaths and growing life expectancies [6]. Statistics show that a vast majority i.e. up to 90% of those who complete suicide suffer from mental disorders prior to their death [7]. However, the corollary is not true. Studies have depicted that only a minority, accounting for less than 10% of the population suffering from mental disorders eventually die by suicide [8,9].

Identified as a serious global public health dilemma, suicide ranks as one of the leading causes of death across all age groups. Although it continues to remain a serious problem in high income countries,

majority of the burden continues to be borne by low and middle income countries [10,11]. High rates of suicides have also been reported among those in inpatient care. In addition, non-suicidal self-injury without any intention of actually committing suicide is also becoming a growing problem [12,13]. There is need to not only remain particularly aware of the groups more vulnerable to committing suicides but also to better understand the underlying theoretical basis of their motivations and by extension, develop more targeted preventive strategies to systematically tackle the issue and reduce incidence of suicide.

Theoretical basis of suicide in vulnerable populations

Of the various theories put forth to explain the suicide phenomenon, two of the most popularly referenced in literature are The Interpersonal Theory of Suicide by Joiner and O'Connor's Integrated Motivational Volitional Model.

The Interpersonal theory of suicide [IPTS] by Thomas Joiner was designed to explain the reasons behind the engagement of individuals in suicidal behaviors and to distinguish the ones at risk [14]. The

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IPTS offers an explanation for suicidal behavior especially in youth/adolescents and is based on empirical evidence.

Joiner proposed the interpersonal psychological theory of suicide stating that a combination of thwarted belongingness, social alienation and burdensomeness creates the desire for death by suicide. It was further stressed by Cukrowicz that perceived burdensomeness may contribute to death by suicide [15]. Joiner also examined the association of urgency and interpersonal-psychological theory in exacerbating the number of attempts [16]. He eventually insisted the need for clinicians to consider a combination of their patients' levels of belongingness, burdensomeness, and acquired capability [especially previous suicide attempts], while assessing the risk of suicide [17].

Our apprehension towards death is a natural instinct that is a powerful force protecting us. The theory explains that one's apprehension of death is reduced when exposed to physical pain or exasperating life experiences as these encounters stimulate fearlessness and pain insensitivity. They could include childhood trauma, witnessing a traumatic event, experiencing severe illness, or participating in self-harm practices. These behaviors result in desensitization to painful stimuli, and build one's capacity to engage in suicidal behaviors. This provides vital clues for distinguishing individuals who are likely to attempt or die by suicide. Furthermore, past suicidal attempts have been found to be the number one predictor of future attempts and according to Joiner's theory individuals who attempt suicide will acclimatize to the fear of death, and this diminished fear will make the individual prone to making a subsequent attempt.

O'Connor proposed a comprehensive diathesis-stress model focusing on the psychological basis of suicide in individuals [18,19]. His model consists of a combination of pre-motivational phase consisting of triggering factors which provoke the incidence of the event, motivational phase wherein the ideas are formulated and lastly the stage of enactment where the thoughts are translated into actions [20]. Various factors influence the pre-motivational phase including the environment and life events. The person eventually reaches a phase of defeat, humiliation with loss of motivation and poses a threat to himself; eventually. O'Connor emphasizes the need for appropriate interventions at each of the above mentioned phase to identify the potential suicide ideators and stop the occurrence of suicide [18,21].

The five stages of suicide

An individual passes through five stages in the process of planning and completing suicide [22]. The foremost stage is that of denial, where the individual feels the urge yet rejects the impulse of wanting to die by suicide. It actually serves as a temporary defense in an individual. Subsequently, awareness of the possibilities after death replaces the feeling of denial and anger follows. In this stage, the individual recognizes the importance of eliminating the denial. Anger causes an individual to have difficulty caring about anything because of the misplaced feelings of envy and rage. With the fading of anger comes the third stage of bargaining where an individual focuses on giving himself another chance at life. It gives the individual hope and can in some cases even delay death. Usually, there is the negotiation for an extended life in exchange for a reformed lifestyle. At this point, the individual may even consider giving up on the notion of suicide in order to live a better, more fulfilled life. If this is not successful however, it is followed by depression. In this stage, the individual exhibits little or no interest in any activities that he or she may have previously found interesting and becomes certain of death. As such, there is potential to become silent, reject visitors and spend a lot of time grieving and crying. This stage allows the suicidal individual to disconnect from relations and objects

of love and affection. Eventually, depression evolves into acceptance. This is the final stage wherein the individual makes peace with his mortality and impending death.

Slight deviations from these stages occur in people who struggle with death till the very end. Psychologists believe that the more a person struggles with the notion of death, the more likely he is to stay longer in the denial stage [23].

Risk factors

It is substantial to distinguish risk factors of suicidal ideation or behavior and suicide attempt or death by suicide. In general adult population, the risk factors like depression, post-traumatic stress disorder, mood disorders, and hopelessness are strongly related to suicidal ideation rather than to suicidal attempt or progression [21]. In contrast reduced pain sensitivity, fearlessness, acquired capability, physical access to lethal means and low social support may predict suicidal attempts. Theoretically, impulsivity is supposed to be more commonly associated with suicidal attempts but the studies do not support this concept [21].

According to a study in youth population, the risk factors for suicidal ideation in both sexes is physical abuse, a mental health problem, self-harm, being the victim of violence at school, alcohol use, violence perpetration, depressive symptoms, and hopelessness. Females had additional risk factors for suicidal ideation like running away from home, sexual abuse, eating disorders perceiving one-self as overweight and males had marijuana [24].

On the other hand risk factors for suicide attempt are sexual abuse, a mental health problem, running away from home, self-injury, depressive symptoms, and hopelessness. Additional factors in females are found to be physical abuse, dating violence victimization, eating disorders, perceiving oneself as overweight and less anxiety.

Alarming signs in clinical practice

Although it is normal for a person to wish to be alone, suicidal behavior particularly includes social isolation. Individuals who die by suicide often experience social isolation before their death [25]. This soon translates into withdrawal from personal interactions with allies and friends. The cause of the ultimate breakdown may be linked to changes in weather, energy levels, general well-being and health, family, or work-related issues [26,27]. Extremes of moods must be viewed as alarming by the clinician. Literature is replete with evidence that fluctuations in emotions are harbingers of death [28]. For instance, deep emotional decline causes depression that is manifest in different manners. Some depressed individuals choose to isolate themselves whereas some disguise their feelings such that behavioral changes are not easily noticeable [29]. The only way around such situations is having a direct and open conversation with the individual. There is plausibility that showing anger, rage, and cruelty to an individual might result in his/her indulgence in suicidal acts.

Prevention strategies

The crux of suicide prevention lies in a clinician's ability to correctly predict the severity of risk among his or her patients. Such evidence-based practices are heavily reliant on the development of various risk assessment tools to help quantify the problem and lay the foundation for prevention strategies.

Risk assessment tools: History and current measures: In the past, three types of approaches were devised to gauge the risk for suicide. They included the clinical unstructured approach, structured

approach, and actuarial approach [30]. At the beginning, mental health practitioners used the unstructured clinical approach guided by their own experience and intuition to make judgments about the severity of risk [31]. However, due to much criticism [32,33], it came to be viewed as inconsistent and unreliable.

Soon, actuarial risk assessment tools evolved as the more objective and reliable means of predicting risk. Derived from the insurance industry, which used mathematical approaches and statistical probabilities to establish outcomes, these assessments provided an estimate of risk as collated from collected data. Soon however, the need to predict risk based on individuals' notions on their future actions, while simultaneously looking at behaviors of others in comparable situations came to be recognized. Conflicting opinions about the utility and basis of actuarial assessments also emerged alongside. According to Szumkler, the actuarial approach eliminates the challenges arising from the subjectivity of clinical judgment with greater provision for making an informed decision [34]. However, this method had few critics who argued that the actuarial approach would create a misleading sense of proficiency among less experienced clinicians because predictions actually depend on the skills of the clinician [32,33].

The structured clinical approach for risk assessment deploys both the actuarial and clinical approaches. It draws on the fundamentals of the actuarial approaches and attempts to take advantage of available and informed clinical judgment through patient assessment. According to a study, the individual's history, present mental status as well as relevant information are the basis of the structured approach to establish an assessment for risk [35]. Scholars term the approach as collaborative, evidence-based, flexible, and transparent. It has been seen to assist clinicians with extracting information where there is potential to do so, while providing an opportunity for critical thinking at the same time [36].

Today, there are a number of different suicide risk assessments and screening tools used by clinicians to assess individuals for suicidal ideation and behaviors, as well as rate their ideations on a scale of severity. Notable among them are the Columbia- Suicide severity rating scale [C-SSRS], the Suicide Assessment Five-Step Evaluation and Triage [SAFE-T] and the Suicide Behaviors Questionnaire [SBQ-R], of which the C-SSRS, available in 114 languages is the most popular. It rates an individual's degree of suicidal ideation on a scale, ranging from "wish to be dead" to "active suicidal ideation with specific plan and intent". Its purpose is to identify behaviors indicative of an individual's intent to commit suicide. Data from studies using the electronic Columbia-Suicide Severity Rating Scale [eC-SSRS] to prospectively monitor suicidal ideation and behaviors were analyzed to report that patients with lifetime suicidal ideation, intent and/or prior suicidal behavior at baseline are 4 to 9 times more likely to prospectively report suicidal behavior during study participation [37,38]. In a study, 3,776 patients completed a baseline and 1 or more follow-up assessments. The mean follow-up period was 64 days. Of patients with negative lifetime reports, 2.4% subsequently reported suicidal behavior during study participation, compared to 12.0% of patients with lifetime ideation with intent only [OR=5.55; 95% CI, 2.65-11.59], 9.6% of patients with lifetime behavior only [OR=4.33; 95% CI, 2.94-6.39], and 18.3% of patients with both [OR=9.13; 95% CI, 6.47-12.88]. Sensitivity and specificity of positive reports from this scale for identifying suicidal behaviors were 0.67 and 0.76, respectively.

The utility of this tool has been well recognized by different sources that have reported it to be valid and reliable [39,40]. Center stone, one of the nation's largest not-for-profit multi-state behavioral

health organizations reported that the use of C-SSRS in screening and assessing their patients resulted in a 71% reduction in the rates of suicide across multiple states.

Risk assessment in the emergency department: The challenges with prediction and accurate reporting: The emergency department [ED] serves as a venue for primary triage for the mental health system [41,42] and thus it is critical to identify at-risk individuals in this clinical setting. Several factors have been associated with elevated suicide risk in patients presenting to the ED. Psychiatric chief complaints, interpersonal violence and substance abuse are known to correlate strongly with the high incidence of suicide among patients presenting to the ED [43]. Current studies demonstrate that when such patients seek care in the ED, severity and intensity scales aid in predicting future suicide attempts [44].

The importance of clinicians being able to identify the complex interplay between behavioral changes, substance abuse, stressors and the development of active plans for suicide, especially in individuals presenting to the ED with subclinical mental health cannot be underemphasized. Moreover, it is just as important to be aware of the demographics and specific social determinants of the patient population most likely to present in such settings. Over the past two decades, the rate of self-mutilation escalated to four-fold among adolescents, a subset of the population more likely to frequent the ED [45]. Unfortunately however, medical records and diagnostic coding analysis showed that less than 3% of ED clinicians have been able to correctly identify suicidal ideation or behaviors in these patients during this time span [45,46].

Various screening tools have been tested in the ED setting to assess suicidal risk. A multi-component screen that is able to identify recent suicidal behavior, current suicidal ideation, concurrent depression and drug abuse is most useful here [47]. One such screening tool, the Ask Suicide-Screening Questions [ASQ], consists of four questions that can assess recent thoughts of "being better off dead, wishing to die, suicidal ideation, and past suicidal attempts" [48]. Despite demonstrating a strong validity, there still remains need to study this tool longitudinally to determine its accuracy in predicting future suicidal attempts. A study in England revealed the increase in the use of locally developed risk assessment tools, in conjunction with the well-recognized Sad Persons Scale [49]. However, the scale has no evidence of predicting future suicide attempts among ED psychiatric patients.

Research in the Emergency Department has focused traditionally on small patient numbers with most studies examining the cross-sectional associations between risk factors and current suicidal presentations [50]. Also most previous studies on suicide risk screening in the ED have emphasized solely on suicidal ideation and have overlooked the critical risk factor of 'past suicidal attempts' [51,52]. The mental health field however, now requires an ultra-brief yet convenient primary suicide risk screener which addresses these issues and can be adopted by the ED staff globally. A full-fledged diagnostic tool for evaluation of suicide risk will significantly improve the efficiency of ED physicians, decrease mortality and inpatient admissions and channelize hospital resources for other patients in dire need.

Use of online assessments: Self-reporting of a suicidal ideation is often viewed with an underlying sub-conscious stigma and therefore under reporting in a bid to avoid shame or embarrassment is a common occurrence [53]. The way around this challenge is to increase use of computer-based interviews, which ensure confidentiality and improve the reporting rates [54,55].

Social media has become an emerging tool that can assist with research in this sector. The advantages of using technology for online assessments are summarized as follows:

- Social media is highly influential, presents the possibility of passively surveying, and can influence huge masses at a given time. Furthermore, it lowers costs, reaches larger masses over geographically diverse population segments and allows more subjects to get assisted, thereby increasing the power of the study.

It has been studied by Haas et al that when high risk college students utilize online services for their suicidal risk assessment, they are three times more likely to seek medical treatment than those who do not access these online assessments [56].

Internet-based methodology increases reliability, efficiency and improvements in measurement and analysis.

A protocol which focuses on ethical practices as well as overcomes logistical issues needs to be implemented to allow researchers to reap the benefits of online methodologies. That said, a lack of clarity in communication about ethical problems in suicide research has been found to pose a formidable challenge for members of ethics committees to approve protocols for online methodology [57]. This can be overcome by prior generalized debriefing of the subjects by the researcher.

Primary prevention: Measures of primary prevention directed at a large population include controlling drug abuse and alcohol abuse, as well as effective management of secondary problems that arise from psychiatric disorders. Measures to modify environmental and personal factors also contribute to reduction in suicide rates. Steps must be taken to reduce social alienation and social exclusion, in addition to minimizing the adverse consequences of poverty and incurable physical illnesses through social support. The crux of prevention lies in improving the quality of lives and bringing about behavior changes and this can be achieved through awareness campaigns and counseling sessions in the communities.

Guidelines for prevention of suicide: The “Prevention of Suicide: Guidelines for the formulation and implementation of national strategies” [United Nations, 1996] highlighted the need for a multidisciplinary collaborative approach to identify key elements of effective suicide prevention strategies [58]. This approach called for support from the government to develop a conceptual framework, define measurable objectives, and identify organizations to assist with the implementation of these objectives. At a population health level, the call for a national strategy laid emphasis on promoting early identification and treatment of individuals at risk, increasing public and professional access to information on suicide prevention and awareness of mental health and drug use. It also highlighted the importance of supporting integration of data collection systems to identify at-risk persons and situations, tackling social stigmas related to suicide and suicidal behaviors, and promoting effective coping with its negative consequences. By extension it reported need for provision of rehabilitative services and establishment of institutions to focus on research and training to combat suicidal behaviors.

A stepwise approach to a national suicide prevention strategy was prepared by the WHO in 2012 in accordance with the objectives and outlines set in 1996 by the UN. It is a framework designed to bring communities together at local and international levels to establish and adopt policies for suicide prevention. The main components of this approach and the corresponding recommendations are as follows:

Identifying stakeholders: A multi-sectoral approach to identify stakeholders should involve but not be limited to: various government sectors [Ministry of Health, Education, and Social Welfare], the general public health sector [public health managers, physicians, nurses, paramedics, bereavement specialists, social workers], mental health providers [psychiatrists, psychologists, social workers both in public and private sectors], education sector [teachers, counselors, administrators, student leaders], legal authorities, police, prison and criminal services, parliamentarians, policy makers, relevant vulnerable groups, survivors and families, spiritual leaders, communities, NGOs, media, researchers, national statistic representatives and professional and private sector foundations. Strong leadership is required to enforce this movement. The role of these sectors should be clearly elaborated and the implementation of their duties should be enforced and supervised vigilantly.

Undertaking a situational analysis: The National Statistics Bureau should provide accurate data on the annual incidence of suicide and suicide attempts in a particular location. The modes of attempting suicide and the reasons leading to the act should be thoroughly investigated. Whether comprehensive services were available to these people or not should be sought. Policies should be re-evaluated to reduce the harmful use of alcohol, audit the quality of the media reporting suicidal incidents, and a meticulous investigation should be encouraged to identify and bridge any gaps that exist in the data collection process.

Assessing the requirement and availability of resources: Human resources that can assist in the formulation of these policies include primary care and mental health professionals, community based health workers, personnel responsible for developing and implementing mental health policies, counselors [school, prison, and work counselors], and first line responders [emergency, police, and fire services]. Financial resources can be obtained through funding from annual budgets by federal or central government, state budgets, private funding from philanthropists and organizations, NGO support, and support from international organizations.

Achieving political commitment: Resources would be rendered futile if national and state leaders fail to ensure suicide prevention at a political level. Political commitment can be built by collaborating with national and state leaders and increasing their awareness about this issue. Publications of well-researched policies play a great role in creating strong grounds for commitment. Political leaders who empathize with the issue should be particularly identified and their involvement should be actively sought.

Addressing stigma: People who have attempted suicide or who have lost someone to suicide are known to be afraid and hesitant to seek help due to the fear of being stigmatized in their communities. Therefore, raising awareness of mental health problems, drug abuse consequences, and even about the availability of counseling and prevention services is of prime importance.

Increasing awareness: Media can play a key role in highlighting the significance of suicide prevention, keeping stakeholders informed about the progress made, and involving the general population to understand the development process. This can further be influential when policy makers interact with the general public in order to amend policies.

Additionally it is imperative to provide resources and phone numbers for crisis hotlines to assist those at risk. Researchers and physicians should make the self-reported contact information items mandatory and offer risk notification options, which will ensure that

participants can be contacted in the event of an emergency. Ideally there should be a minimum to no time delay between suicidal risk notification and checking. Text messages or email communication with researchers can also play extremely important roles in mitigating the risk for harm between the time of risk detection and response to allow for a thorough detailed risk assessment [59].

Secondary prevention: The secondary prevention measures of suicide refer to specific approaches aimed at reducing the incidence of reattempting suicide within vulnerable groups and minimizing its negative consequences. It begins with identification of these groups to allow for better targeted interventions that are more acceptable, efficient, and reliable. This should be followed by accurate risk assessment. However, despite the high prevalence of suicide among communities and certain groups, psychiatrists achieve only modest success at forecasting and preventing suicide. This poses a challenge for devising a safe management plan. The mnemonic SUICIDE, elaborated below is known to help psychiatrists remember the key components to document in patients' records.

- **Suicide assessment:** Assess the patient for suicide risk factors and protective variables.
- **Unpredictable and unpreventable:** Recognizing the unpredictable nature of the phenomenon, psychiatrists have the onus of performing a complete and thorough risk evaluation, reacting suitably to those risks, and starting a safe discharge plan.
- **Interventions:** Offer treatment options including suicide protective medication, substance abuse rehabilitation and psychotherapy.
- **Clear and comprehensive documentation:** Concisely document suicidal or homicidal ideation.
- **Intent:** Assess the fatality of the suicidal attempt, the method, and extent of the suicidal ideation or attempt.
- **Discuss the treatment plan:** Encourage safe discharge by including social support, demanding all methods of self-harm like fire arms and old prescriptions be expelled from the patient's home, and assist relatives and friends recognize signs of suicidal ideation.
- **Educate, engage, and empathize with the patient:** Use the Collaborative Assessment and Management of Suicidality [CAMS]: an organized, evidence-based technique for risk evaluation and treatment planning.

Discussion

Understanding the phenomenon of suicide, accurately predicting the risk among vulnerable populations and preventing incidence have been long-standing challenges for clinicians. However, some valid and reliable risk assessment tools in combination with guidelines often helps implementing the prevention strategies as mentioned above. The individual's history, present mental status as well as relevant information are the basis of the structured approach to establish an assessment for risk. Training the ED physicians to use screening tools to assess suicidal risk in the ED patients with co morbid conditions like behavioral changes, substance abuse, stressors and the development of active plans for suicide might alleviate readmissions.

While it is imperative to understand the theoretical basis of the phenomenon as explained earlier, it is equally important to be able to

access a patient with suicidal ideation considering risk factors, protective factors and vulnerable groups known to have a higher prevalence. It is vital to be able to differentiate the risk factors of suicidal ideation and suicidal attempts. Identifying the stage of committing suicide in a patient will furthermore assist the physician in devising an appropriate treatment plan to avoid the progress of the ideation. Encouragement of patients to use online suicide assessments to self-identify the emergency and seek help, can aid in the process of alleviating the burden of suicide. That said, this is a global problem unlike a medical issue wherein the obligation for treatment lies heavily upon the medical practitioners. It can be effectively tackled by a national suicide prevention strategy, which needs to be implemented in the right cultural contexts and subsequently evaluated for effectiveness in reducing the global burden.

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