



Unique Journal of Medical and Dental Sciences

Available online: www.ujconline.net

Review Article

ETIOLOGY OF SUICIDE

Giri DK¹, Chaudhury S^{2*}, Ghosh DK³, Bakhla AK⁴, Kiran C⁵, Kumar S⁶

¹Consultant Psychiatrist, DMHP, Jamshedpur

²Professor & Head, Dept of Psychiatry, PIMS (DU) Loni

³Professor, Dept. of Pathology, PIMS (DU) Loni

⁴Asst. Prof., Dept of Psychiatry, RIMS, Ranchi

⁵Sr. Resident, Dept of Psychiatry, RINPAS, Ranchi

⁶Asst. Prof., Dept of Psychiatry, Rohilkhand Medical College and Hospital, Bareilly

Received: 04-06-2013; Revised: 25-06-2013; Accepted: 12-07-2013

*Corresponding Author: **Dr. S. Chaudhury**,

Prof & Head, Dept of Psychiatry, Pravara Institute of Medical Sciences (DU) Rural Medical College, Loni Dist. Ahmednagar, Maharashtra.

Email: suprakashch@gmail.com

ABSTRACT

Suicide is a complex biopsychosocial phenomenon in terms of the causes and the processes that lead up to it. The strong link of suicide to psychiatric disorders including depression, bipolar disorder, schizophrenia, alcohol and drug abuse/dependence and severe personality disorders is undeniable; though this is comparatively less in India and Asia. Physical illness also is linked to suicide. Especially in India stressful life events are strongly linked to suicide. The predisposition to suicidal behavior can be described in cognitive psychological, neuropsychological, neuroanatomical and neurobiological terms. The convergent nature of findings in these divergent research domains allows for the description of a hypothetical psychobiological model of the predisposition to suicidal behavior. The first component (attention related perceptual biases related to the sensitivity to particular life events) appears to be mediated by the frontotemporal cortex (in conjunction with the hippocampus) and modulated by the 5-HT_{1A} and noradrenergic neurotransmission systems. Sensitivity to life events is associated with hyper-reactivity of the neurobiological stress system, resulting in increased production of cortisol. The neurobiological aspects of the second component of the predisposition (reduced problem-solving capacity related to deficient autobiographical memory) are less clear, but research outside the suicidological domain suggests involvement of the frontal cortex and the glutamate and GABA-ergic systems. The third component (perceived 'no rescue' following exposure to particular life events due to reduced fluency in generating positive future events) appears to be related to dysfunction of the 5-HT_{2A} system in the dorsolateral prefrontal cortex in conjunction with the amygdale, resulting in increased behavioral inhibition and hopelessness.

Keywords: Suicide; etiology; psychiatric disorders; physical illness; stressful life events.

INTRODUCTION

Suicide is a tragic global public health problem. World Health Organization figures show a suicide takes place somewhere in the world every 40 seconds. Nearly a million people take their own lives every year, more than those murdered or killed in war. An estimated 10-to-20 million attempt suicides each year. In India, 135,445 persons lost their lives by committing suicide during the year 2012¹. Suicide does not have one universally accepted definition. It can however be defined, simply, as intentional self-inflicted death². Suicide is also a behaviour that is very complex. The factors that impact on an individual that lead to choosing suicide as an alternative are multi-dimensional. Numerous factors frequently occur simultaneously providing a bio-psycho-social model for the causes of suicide. Such a model indicates that biological, psychological and sociological factors in combination can

have an adverse effect on an individual and can lead to suicide. To look for one particular cause and state that it was the reason for the person's death can be simplistic and wrong in the vast majority of cases. There are wide range of theories to explain suicidal behavior proposed by different practitioners, researchers, theoreticians and scholars in the fields of psychology, psychiatry, sociology and biology. Only limited progress has been made toward the goal of constructing a comprehensive theory of life-threatening behavior. The major theories of suicide may be conceptually grouped under the following broad headings: (a) Sociological aspects. (b) Psychological aspects. (c) Neurobiological and Genetic aspects.

SOCIOLOGICAL ASPECTS OF SUICIDE

Sociologists were among the first to formally develop theories pertaining to suicide. Classic sociology views suicide as a

social, not an individual, phenomenon. The suicide victim's moral predisposition to commit suicide, not his or her individual experiences, is felt to be the crucial factor. Suicides are seen as a disturbance or symptom of a relationship between society and individuals. Emile Durkheim's sociological theory³ established an important model of sociological study of suicide. He argued that suicide results from society's strength or weakness of control over the individual. He identified four basic types of suicide.

Anomic suicide reflects a situation where an individual is no longer guided by the society due to its weakness. This occurred when traditional norms and values were disrupted by rapid social change which produced uncertainty in the minds of individuals as society's guidelines for behavior became increasingly unclear.

Altruistic suicide took place when the individual was so well integrated into society that they sacrificed their own life out of a sense of duty to others.

Egoistic suicide is an individualistic decision of a person no longer dependent on others' control or opinion. It resulted from the individual being insufficiently into social groups and society to which he belonged.

Fatalistic suicide is seen as a result of strict rules in a society which have proved decisive for the destiny of an individual. It was the suicide 'of persons pitilessly blocked and passions violently choked by oppressive discipline'.

Interpretive theories of suicide:

Suicide as problem solving This theory sees suicidal behavior as a way of responding to and trying to solve a problem⁴. Suicide is adopted when there seems to be no alternative solution. From this perspective suicides are classified into four main types depending upon the type of solution they offer and the type of situation they are a response to:

Escapist suicides take three forms. Some people take their own lives as a means of flight from an intolerable situation. For others, suicide is a response to grief about the loss of something in particular, perhaps a loved one or even a limb. Suicide may also be a means of self punishment used by a person when they feel they have done wrong.

Aggressive suicides are a way of harming another person or people and are of four types:

Vengeance suicides are intended to make another person feel guilty or to bring condemnation on them from society.

Crime suicides involve killing another person during suicidal behavior.

Blackmail suicides are used to persuade someone else to change his behavior and treat the suicide victim better.

Appeal suicides are used to show others that the person concerned is in need of help. Blackmail and appeal are often the ends pursued by those who made suicide attempts that either fail or are not entirely serious.

Oblative suicides are ways of achieving something that is particularly valued by the victim. They are of two types:

Sacrifice suicide involves giving up your own life to save another person.

Transfiguration suicides are used by a person so that they can obtain a more desirable state: for example, to join a loved one in the afterlife.

Ludic suicides involve taking deliberate risks that might lead to death. These are of two types:

Ordeals are ways by which an individual tries to prove themselves to others by showing their bravery.

Games involve taking risks 'for the hell of it'.

Beyond positivism and phenomenology

Moving beyond all the approaches that have been examined so far, Taylor⁵ argued that suicides are either 'ectopic' – they result from what a person thinks about themselves – or 'symphysic' – they result from a person's relationship with others. Suicides are also related either to certainty or uncertainty – people are sure or unsure about themselves or about others. Thus, like Durkheim, Taylor also distinguishes four types of suicide connected to diametrically opposed situations. However, they are situations faced by particular individuals and are not related to the wider functioning of society.

The first two types are **ectopic** or **inner-directed** suicides and include:

Submissive suicide occurs when a person is certain about themselves and their life; they believe that their life is effectively over and see themselves as already dead. In this type of suicide the suicide attempt is usually deadly serious – the person is sure they wish to die.

Thanatation is a type of suicide which occurs when a person is uncertain about themselves. The suicide attempt is a gamble which may or may not be survived, according to fate or chance.

The other two types are **symphysic** or **other - directed** suicides which include:

Sacrifice suicides occur when a person is certain that others have made their life unbearable. The person who takes their own life often attributes the blame for their death to others so that they feel guilty or will suffer criticism from other members of society.

Appeal suicides result from the suicidal person feeling uncertainty over the attitudes of others towards them. The suicide attempts are a form of communication in which the victim tries to show how desperate they are, in order to find out how others will respond.

Other approaches:

To address some of the limitations of purely sociological approaches, some theories have attempted to synthesize both interpersonal and intrapersonal variables that may bear on suicidal behaviors. Petrez and Riddle⁶ asserted that adolescent suicide is related to interactions of multiple social factors (e.g. family conflict, social adjustment, and social relationships and cognitively based psychological factors (e.g. conceptions of death, hopelessness, intention, and motivation).

Jobes⁷ postulated that suicidality can often be understood in terms of a continuum between two fundamentally different psychological orientations to suicide. At one end are individuals who have an intrapsychic orientation to suicide and the other end of continuum are individuals who have an interpsychic orientation to suicide.

Hendin's theory⁸ of youth suicide attempts to explain the phenomenon from both epidemiological and psychodynamic perspectives. Hendin asserts that integrative social and psychological conceptualizations of youthful suicide provide a

framework for understanding the personal meaning of life and death. Lester⁹⁻¹⁰ has proposed a socio-psychological perspective that attempts to explain youthful suicidal behavior as a function of quality of life. Lester¹¹ has shown that nations with a higher quality of life have higher suicide rates. They asserted that when people have a clear external source of blame for their misfortune, they are more likely to be angry and assaultive, and thereby less depressed and suicidal.

Joiner¹² contends that serious suicidal behavior requires each of three specific interpersonal-psychological precursors. These precursors include

- (a) An acquired capacity to enact lethal self-injury,
 - (b) A sense that one has become a burden to loved ones, and
 - (c) A sense that one is not interpersonally connected with a group or relationship.
- Joiner¹³ argues that although the acquired ability to commit suicide is necessary, it is not sufficient for a terminal outcome because the person has to want to die by suicide. According to Joiner the essential desire comes from two important sources: the person's sense of being ineffective and therefore being burden to others, and the person's sense that they are disconnected from others in a relational sense.

Life events and social support

Suicidal individuals are found to have experienced a high level of stress for a long period of time, and often have an increasing level in the time leading up to their suicidal action. Usually the sum effect of events is overwhelming and more important than a single life event. In addition, suicidal individuals are found to have few resources, and the resources that they have are often unavailable. For example, the people available to turn to for help may be resented by the suicidal person, or the resources may be hostile toward the suicidal person. Job problems, family discord, illness, financial trouble, unemployment, separation, and death and illness in the family are the most common life events preceding suicide. Life events as a cause of suicide are especially important in India and Asia, where they are the most common causes for suicide. Sociological studies generally show that because of the social and emotional stability and security provided by the "family society", the suicide rate among married people tends to be significantly lower.

Fluctuations in social and economic conditions frequently result in changes in the suicide rate. In the United States, for example, suicide rates declined during World War I and World War II, when unemployment was low, but increased during the Great Depression of the 1930s, when unemployment was high.

Occasionally, people commit suicide as a form of protest against the policies of a particular government. Mass suicides, in which large numbers of people kill themselves at the same time, are extremely rare.

Gender role socialization

Men have higher rates of suicide than women. Reasons for high male suicide rates include the following¹⁴:

1. The rate of alcohol abuse in females is much less than in males.
2. Religiosity level, which provides numerous coping devices and negative attitudes towards suicide, is significantly higher for women than for men.

3. Women have stronger attitudes than men towards the acceptability of completed suicide and more positive attitudes towards suicide attempts.

4. Women have more flexible coping skills than men because of their greater number of role changes during the life course.

5. Women are more likely to recognize and less likely to deny the warning signs of suicide, such as depression, than men.

6. Women are more likely than men to seek professional help.

7. During crisis women have more extensive social support systems to draw on than men.

8. Cultural emphases placed on being male included competitiveness, impulsiveness-decisiveness, and being strong, all of which increase lethal suicidality.

9. Usually, women have had less access to lethal technology (e.g. firearms) than men.

10. Failure in the primary adult male role (economic success) is more visible and obvious than failure in the primary adult female role, which is diffuse (success in relationships). Males are more likely to feel like failures in their primary role and therefore are more likely to commit suicide.

Psychological Aspects of Suicide

Psychoanalytically Oriented Theory:

The first important psychological insight into suicide came from Freud¹⁵ who stated that the self-hatred seen in depression originated in anger toward a love object, anger that the person turned back on himself. He regarded suicide as the ultimate form of this phenomenon, and doubted that there would be a suicide without the earlier repressed desire to kill someone else. Suicidal psychodynamics may arise from guilt for wishing the death of parents, identification with a parent's death, revenge for loss of gratification, or a request for help, and from the tension between instincts of life (Eros) and death (Thanatos)¹⁶. Menninger¹⁷ suggested that all suicides have three interrelated and unconscious dimensions: revenge/hate (a wish to kill), depression / hopelessness (a wish to die), and guilt (a wish to be killed). Each of these three wishes is present in every suicide, with one predominating the other. Zilborg¹⁸ considered narcissistic aspects of suicide, conceptualizing suicide as a primitive act in which one attempts to achieve a fantasized immortality. Asserting that the role of a broken home in suicide proneness reflects both internal and external etiological influences. Jung thought that suicide destroyed harmony between the conscious and the subconscious mind based on repressed aggressive impulses, in part directed toward components of the opposite sex within the self, and theoretically correctable by making the unconscious conflict conscious¹⁹. Klein²⁰ postulated that while the ego tries to kill the bad objects and the id, it simultaneously tries to save the good object by internalizing them and the part of the ego which is identified with them. Adler²¹ viewed suicide as an interpersonal act: because of insufficient social interest, a suicidal individual hurts other by inflicting injury upon himself for herself.

Sullivan similarly emphasized that interactive aspects of suicide, asserting that suicide is usually emphasized the interactive aspects of suicide, asserting that suicide is usually an interpersonally destructive activity that reflects a hateful and hostile type of integration with others²². In the Jungian tradition, Wahl²³ hypothesized that suicide represents a desire

for rebirth or resurrection to a new and better life. Rojtenberg²⁴ concludes that the suicide victim values death as an alternative, the only one which will help him to stop his intense suffering and psychological pain.

Developmental Theory

Adolescent developmental issues are interactive with the family systems, which may foster a shared family regression which ultimately leads to feelings of abandonment, rage, or both, which may in turn lead to self-destructive acting out²⁵. Emery²⁶ proposed a developmental perspective that emphasizes identity formation through psychosocial development and epigenetic maturational processes unique to adolescence and the individual.

Family Systems Theory

According to this approach, disturbances in family structure – including role conflicts and blurring of role boundaries, secretiveness and failures of communication, and rigidity with inability to accept change or tolerate crisis- promote suicidal acting out within the family system²⁷. Also implicated in family theories are the potential influence of parental psychopathology and the influence of conscious and unconscious wishes by the parent to kill off the child which may lead to the child's suicidal acting out²⁸.

Behavioral and Cognitive Theory

These address some of the various and unique cognitive aspects of suicide in their discussions of cognitive constriction, ambivalence, rigidity and dichotomous thinking²⁹⁻³¹. Common characteristics of suicides include a sense of unbearable psychological pain, a sense of isolation from others, and the perception that death is the only solution to problems about which one feels hopeless and helpless. According to Schneidman³⁰⁻³¹, suicide results from “psychache,” a word he coined to describe the unbearable psychological pain arising largely from frustrated psychological needs. “There is a great deal of psychological pain in the world without suicide,” said Shneidman. “But there is no suicide without a great deal of psychological pain.” He described ten characteristics that are commonly associated with completed suicide:

1. The common purpose of suicide is to seek a solution. Suicide is not a pointless or random act. To people who think about ending their own lives, suicide represents an answer to an otherwise insoluble problem or a way out of some unbearable dilemma. It is a choice that is somehow preferable to another set of dreaded circumstances, emotional distress, or disability, which the person fears more than death. Contemplating suicide as a potential solution may be increased by a family history of similar behaviour. If someone else whom the person admired or cared for has committed suicide, then the person is more likely to do so.

2. The common goal of suicide is cessation of consciousness. People who suicide seek the end of the conscious experience, which to them has become an endless stream of distressing thoughts with which they are preoccupied. Suicide offers oblivion.

3. The common stimulus (or information input) in suicide is intolerable psychological pain. Excruciating negative emotions — including shame, guilt, anger, fear, and sadness — frequently serve as the foundation for self-destructive

behaviour. These emotions may arise from any number of sources.

4. The common stressor in suicide is frustrated psychological needs. People with high standards and expectations are especially vulnerable to ideas of suicide when progress toward these goals is suddenly frustrated. People who attribute failure or disappointment to their own shortcomings may come to view themselves as worthless, incompetent or unlovable. Family turmoil is an especially important source of frustration to adolescents. Occupational and interpersonal difficulties frequently precipitate suicide among adults. For example, rates of suicide increase during periods of high unemployment.

5. The common emotion in suicide is hopelessness-helplessness. A pervasive sense of hopelessness, defined in terms of pessimistic expectations about the future, is even more important than other forms of negative emotion, such as anger and depression, in predicting suicidal behaviour. The suicidal person is convinced that absolutely nothing can be done to improve his or her situation; no one else can help.

6. The common internal attitude in suicide is ambivalence. Most people, who contemplate suicide, including those who eventually kill themselves, have ambivalent feelings about this decision. They are sincere in their desire to die, but they simultaneously wish that they could find another way out of their dilemma.

7. The common cognitive state in suicide is constriction. Suicidal thoughts and plans are frequently associated with a rigid and narrow pattern of cognitive activity that is comparable to tunnel vision. The suicidal person is temporarily unable or unwilling to engage in effective problem-solving behaviors and may see his or her options in extreme, all or nothing terms. As Shneidman points out, slogans such as “death before dishonour” may have a certain emotional appeal, but they do not provide a sensible basis for making decisions about how to lead your life.

8. The common action in suicide is escape.

Suicide provides a definitive way to escape from intolerable circumstances, which include painful self-awareness.

9. The common interpersonal act in suicide is communication of intention. One of the most harmful myths about suicide is the notion that people who really want to kill themselves don't talk about it. Most people who attempt suicide have told other people about their plans. Many have made previous suicidal gestures. Shneidman estimates that in at least 80 percent of completed suicides, the people provide verbal or behavioral clues that indicate clearly their lethal intentions.

10. The common consistency in suicide is with life-long coping patterns. During crisis that precipitate suicidal thoughts, people generally employ the same response patterns that they have used throughout their lives. For example, people who have refused to ask for help in the past are likely to persist in that pattern, increasing their sense of isolation.

Cognitive theorists emphasize the role of inflexible thinking or tunnel vision (life is awful, death is the only alternative) and an inability to generate solutions to problems. According to psychologists, many suicide attempts are a symbolic cry for help, an effort to reach out and receive attention. Within the

cognitive perspective, hopelessness has been found to be perhaps the most relevant clinical variable implicated in suicidal behavior. In his discussion of suicidal ideation and attempt behaviors, Williams³¹ contends that what has been commonly referred to historically as a “cry for help” is actually a “cry for pain”. This notion naturally leads to a central point offered by Williams, which is that most suicidal people are not motivated by a wish to die as much as they are motivated by a wish to escape from an otherwise unbearable situation.

The entrapment model:

Early cognitive accounts of suicidal behavior were developed from cognitive theories of depression. Suicidal patients were assumed to share depressed patients’ high frequency of negative thinking, compounded by logical errors and a tendency for long term schemas or belief structures to be activated by current life events. Indeed, of all the psychological variables that are studied in suicidal patients, it is those of depression, hopelessness and problem solving that have become a recurrent theme. Studies of major depression in clinical populations show rates of suicidal ideation in excess of 50%. However, the majority of individuals who experience suicidal ideation do not make a suicidal attempt³³. Suicidal ideation and behavior arise from feelings of entrapment, that this represents a particular pattern of information processing about the self and the world³². Entrapment can be defined as the inability to get away from an aversive environment after one has suffered a defeat, loss or humiliation. When such defeats, humiliations and entrapments occur, then the risk of suicidal behavior is increased. This will occur across different diagnoses, and may be especially relevant in situations where the symptoms of a mental health problem are themselves a source of humiliation and entrapment for the person³⁴⁻³⁵. People vary in their general tendency to see events through the lenses of defeat and entrapment. These individual differences in processing information influence the likelihood that helplessness scripts will be activated in response to humiliating or defeating events, and thus influence the levels of depression that results.

The arrested flight (‘cry of pain’) model: The arrested flight model has three components: sensitivity to cues in the environment that signal defeat or humiliation and give rise to an overwhelming feeling of needing to escape, a sense of being unable to escape, and the sense that this state of affairs will continue to indefinitely (that there will be no rescue). The first component, sensitivity to cues signaling defeat suggests that in addition to exposure to actual events some people become sensitized to these themes. As a result they are prone to interpret even relatively neutral events as representing humiliation or defeat, at least when they get into particular moods. The second component, being unable to escape, arises from deficits in interpersonal problem solving. Such problem solving difficulties are closely associated with the tendency to retrieve personal memories from the past in an overgeneral way. The third aspect of the arrested flight model is the tendency to reject such entrapment into the future-hopelessness. The greater hopelessness is a function of lack of positive future, not an excess of negative future. O’ Connor³⁶ compared suicidal patients and hospital controls on measures

of perceived stress, perceived opportunity for escape from most stressful recent experience, feelings of defeat, and level of social support (opportunity for rescue). Parasuicide patients were found to be more depressed, anxious and hopeless and to have higher levels of stress than hospital controls. Importantly, they also reported significantly higher levels of defeat, lower levels of escapability, and lower levels of social support.

Hopelessness theory of suicide:

Beck et al³⁷ formulated a hopelessness theory of suicide based on his clinical experience with 50 depressed suicidal patients. He reported that suicidal crises were consistently “related to the patients’ conceptualization of their situation as untenable or hopeless. Hopelessness was the catalytic agent in suicidal episodes and suicidal behavior resulted when an individual was both hopeless and his or her reasoning was impaired. Beck theorized that suicidal behavior was derived from specific cognitive distortions in which patients viewed their experiences negatively and they believed that their attempts to attain major goals would end in failure.

Suicide Mode:

In response to subsequent research, Beck³⁸ refined his original model of cognitive therapy. His revised theory encompasses the concept of “modes”. Modes are interconnected networks of cognitive, affective, motivational, physiological, and behavioral schemas that are activated simultaneously by relevant internal or external events and orient the individual to achieve some goal.

When the suicide mode is activated, an individual experiences suicide-related cognitions, negative affect, physiological arousal, and the motivation or intent to engage in suicidal behavior. The suicide mode is more easily activated in individuals who have engaged in prior suicidal behavior³⁹.

The A-B-C Model applied to suicidality: Table 1 shows the application of the three component model of Rational Emotive Behavior Therapy to suicidality. Here the emotional and behavioral consequences take the form of suicidal thoughts and behaviors, as well as the related feelings of desperation and despair. Consistent with research in the area, the model shows that a variety of activating events are capable of setting the suicidal process into motion. Prominent among these are various losses, including interpersonal losses (e.g., divorce, or death of loved ones) and achievement setbacks (such as business failures). Medical illnesses and associated losses in physical capabilities constitute another common situational trigger, particularly among elderly individuals. Not all individuals with these adverse events become suicidal. REBT explains individual differences in emotional and behavior responses primarily through the mediational link at beliefs. Common dysfunctional beliefs manifested by suicidal individuals include the following⁴⁰:

- My worth as a person depends on my achieving the things I strongly want to achieve and my being loved by people whose affection I very much want
- If I fail at love or achievement, I am a worthless person and my life is therefore not worth living.
- I cannot stand life without the love that I crave.
- I can’t bear being unhappy.

- I can't bear being sick or in pain.
- I must receive caring and support from others, even if I have to threaten suicide or injure myself to get it.
- Being miserable today means that I will be miserable forever.
- I am a fundamentally unlucky and unfortunate person and therefore can't expect anything but unhappiness and misfortune in the future.

- Mistakes and failure are too shameful to bear.
 - Life isn't worth living if I can't have what's important to me.
 - I will be better if I kill myself.
- My loved ones would be better off if I were dead.

Table 1: Rational Emotive Behavior Therapy model of suicidal behavior: Common activating events, beliefs, and consequences⁴⁰.

Activating events (A)	Beliefs (Cognitive Processes; B)	Emotional-behavioral consequences (C)
Interpersonal loss	"A-C" thinking	Despair
Achievement loss	Awfulizing	Desperation
Health loss	Catastrophizing	Self-disgust
Interpersonal conflict	Contingent self-worth	Suicidal ideation
Relationship failure	Low frustration tolerance	Suicidal impulses
Occupational failure	Negative self-rating	Self-harm behaviors
Social stressors	Hopelessness	Suicide

Cognitive psychological and neuropsychological aspects of the predisposition to suicidal behavior

There is limited knowledge about the state of mind of suicidal individuals and relatively little is known about the most basic aspects of cognitive processing in suicidal individuals. However, impaired cognitive functioning is observed in psychiatric disorders for which suicide risk is elevated⁴¹ and insight into the cognitive characteristics of suicidal individuals is increasing⁴². It thus seems that three characteristics differentiate depressed individuals who are suicidal from depressed persons who are not. These include:

1. A sensitivity to particular life events reflecting signals of defeat, leading to involuntary hypersensitivity to stimuli signaling 'loser' status.
2. 'No escape': the sense of being trapped, which is related to an insufficient capacity to solve problems, which arise from the confrontation with stimuli as described above.
3. 'No rescue': the absence of rescue factors, mediated by deficient prospective cognitive processes leading to feelings of hopelessness.

Personality Traits

Depression and personality deviations occur together⁴³⁻⁴⁴. Stress produced by traumatic events or situations together with inadequate coping skills, is probably an important aetiological factors in many cases of depression⁴⁵. Thus suicidality might be not so much a feature of depression as such, but rather a consequence of pre-existing personality traits. About 30% of a sample of completed suicides had a diagnosis personality disorder⁴⁶. Maladaptive personality traits (e.g. paranoid) may be reasonably common among those at risk⁴⁶. Neuroticism and external locus of control were significant risk factors for suicide attempts⁴⁷.

The role of impulsive-aggressive behaviours in risk of suicide has been well substantiated by several lines of evidence, including case-control studies in clinical populations, cohort studies in epidemiological samples, retrospective studies of completed suicides and case registries. The association between impulsive-aggressive

behaviours and suicide is primarily seen among young people and seems to be independent from the role of associated axis I psychopathology, particularly major depression. High levels of impulsive-aggressive behaviours have been linked to early life environmental stressors such as childhood abuse and neglect, and these stressors are also more commonly seen among impulsive-aggressive suicides⁴⁸.

On the basis of studies, both postmortem and clinical, of suicidal adolescents in Israel, Apter⁴⁹ has posed a typology of the following three maladaptive personality constellation in suicidal behavior:

1. *Narcissistic-perfectionist type*. They have an inability to tolerate failure and imperfection. Combined with an underlying isolative, private, or even schizoid personality structure, he or she doesn't ask for help or support and tries to maintain a positive impression on others while harboring shame.
2. *Impulsive-aggressive type*. Oversensitivity to minor hassles and life stressors leads this adolescent to react with anger and anxiety, then to develop a secondary depression and suicidal behavior.
3. *Mental disorder- hopelessness type*. This adolescent is driven to suicide by a combination of significant Axis I psychopathology and hopelessness.

Neurobiological and Genetic aspects of suicide

The involvement of at least three neurobiological systems in suicidal behavior has been documented using a vast number of divergent research approaches. The various studies in relation of neurotransmitter systems and cell signaling systems to suicide have recently been reviewed and summarized in Table 2⁵⁰ and 3⁵⁰.

Challenge studies

Fenfluramine and other Neuroendocrine challenge studies

Because the release of serotonin causes a measurable increase in serum prolactin levels the fenfluramine challenge test provides an indirect probe of central

serotonergic functioning. Most studies have found that depressed subjects have a blunted Prolactin response to fenfluramine challenge compared to controls, but few have shown that the blunted response is trait marker that persists after the depression remits⁵¹⁻⁵². Four studies have reported an association between a Prolactin response to fenfluramine and a history of suicide attempts⁵³.

Cholesterol studies

Observational studies have shown a relative risk for suicide as high as 4.2 fold in the low cholesterol group. In a case-control study, 331 individuals admitted to psychiatric unit for suicidality were found to have significantly lower cholesterol levels than a matched sample.⁵⁴ The cholesterol-serotonin hypothesis posits that low cholesterol results in reduced serotonergic function and thereby predisposes individuals to impulsive behavior associated with the risk of accident or suicide⁵⁴.

Functional neuroimaging

Using PET and fenfluramine challenge, measuring brain glucose utilization in high lethality vs low lethality suicide attempters have shown relative hypometabolism in the ventral, median and lateral prefrontal cortex in high lethality attempters compared with low lethality attempters, the difference becoming more marked after fenfluramine administration⁵⁵. Using SPECT and the high selective [¹²³I] 5-I R91150 radioligand, it could be demonstrated that the binding potential of 5-HT_{2A} receptors in the (particularly dorsolateral) prefrontal cortex of attempted suicides was significantly lower than that of healthy controls⁵⁶.

Hypothalamic-Pituitary-Adrenal Axis

Most studies indicate increased activity of the HPA axis in association with suicidal ideation and/or behavior. Increased urinary cortisol secretion has been demonstrated in attempted suicide patients,⁵⁷ while elevated CSF levels of CRH and reduced postmortem CRH binding sites were found in suicide completers⁵⁸. Non-suppression of plasma cortisol levels after administration of dexamethasone was associated with a 14 fold increase in the likelihood of suicide during 15 years of follow-up⁵⁹.

Genetics of Suicide

Twin studies show monozygotic concordance of 11.3 and dizygotic concordance of 1.8². Suicide risk is eight times greater for first-degree relatives of psychiatry patients than controls, and four times greater among first-degree relatives of psychiatry patients who had committed suicide⁶⁰. In families with a heavy genetic loading for mood disorders the suicide rate was higher. The genetic factor for suicide may be independent or in addition to the genetic transmission of mental disorders⁶¹⁻⁶⁴.

Psychiatric illness

Severe mental illness has been shown, consistently to increase the risk of suicide⁶⁵⁻⁶⁶. Virtually all mental disorders carry an increased risk of suicide, except for mental retardation and dementia. A meta-analysis estimated that mental illness conferred a risk 11 times that of the general population, the highest risks occurring in anorexia nervosa, substance dependence, and depression⁶⁷. The mortality risk for suicide in major depression is 20 times that expected, and 15- to 20- fold in all affective disorders.

Every sixth death among depressive people treated as psychiatric patients is by suicide⁶⁸. Alcohol and drugs often combined are a major risk or a precipitating factor for suicide. They may intensify the suicidal intent, offer a constantly available suicide method, worsen the somatic status of the victim and increase the risks of complication after the attempt. It impairs judgment and lowers the threshold to suicide⁶⁹. The lifetime risk of suicide has been estimated 7% for alcohol dependence, with only slight variation over the life⁷⁰. The suicide risk in schizophrenia appears to be almost 10 times higher than the general population⁶⁷. The great majority of schizophrenic patients commit suicide in active phase of the disorder after having suffered depressive symptoms. Most of the suicide victims with personality disorder, especially with borderline personality disorder, have also comorbid depressive disorder or substance abuse. This type of comorbidity is very frequent among the young suicide victims⁷¹. Bingeing/purging type of anorexia nervosa is largely associated with suicidal attempts⁷². These diagnoses confer an increased risk generally but a broader range of variables needs to be considered in order to identify and target effectively those at greatest risk. Clinical factors shown to increase risk independently in all diagnostic groups are: a history of deliberate self-harm, suicidal ideas during aftercare⁷³, a family history of suicide or recent bereavement⁷⁴.

Physical Illness

Physical Illness is present in a high proportion of people who commit suicide. A review article cited several large studies that reported that medical illness was present in 3—40% of the patients who committed suicide⁷⁵. About 2% of the Finnish suicides occurred in medical or surgical inpatients⁷⁶. Harris & Barraclough⁶⁷ in their meta-analysis concluded that the only disorders that actually elevated suicide risk were HIV and AIDS, Huntington's disease, cancer (particularly head and neck), multiple sclerosis, peptic ulcer disease, end stage renal disease, spinal cord injuries, and SLE. Suicides in the medically ill appear to be related to frequently unrecognized comorbid psychiatric illnesses, including depression; substance related disorders, delirium, dementia and personality disorder⁷⁷. Thus though somatic disease is one important factor in the complexity of the suicidal act, psychiatric conditions such as depression and alcohol abuse are more significant. In India physical illness including AIDS/STD, Cancer, Paralysis, and other prolonged illnesses accounted for 14.3% of suicides (Table 4). It is fruitful to determine whether the patient is at a particularly emotionally difficult time in his or her illness course, and whether secondary effects of the medical illness—pain, physical disfigurement, cognitive dysfunction, and disinhibition – are present that add to the risk.

CONCLUSION

Suicide is far more common than most people believe and its incidence is increasing every year. While the largest number of suicides is in males in young adulthood, suicides in females in India are also high. Suicide is an extremely complex biopsychosocial phenomenon in terms of the

causes and the processes that lead up to it. The strong link of suicide to psychiatric disorders, including depression, bipolar disorder, schizophrenia, alcohol and drug abuse/dependence and severe personality disorders is undeniable, though this is less in India and Asia. Physical

illness also is linked to suicide. It has been observed that social and situational factors appear to play a relatively greater role than psychiatric illness in suicide in India, as in other Asian studies, compared with Europe and North America⁷⁸.

Table 2: Neurotransmitter systems and suicide. (Furucyz⁵⁰)

System element		Change	Location
SEROTONERGIC			
Receptors	5HT-1A	up regulated	RN, FC
	5HT-1D	down regulated	PFC
	5HT-2A	down regulated	PFC, HIP, FPC
	5HT-2C	up regulated	PFC
	5-HT4	up regulated	FC, HIP, CN, AN
Enzymes	TPH	up regulated	RN
	Serotonin transporter	down regulated	PFC, RN
NORADRENERGIC			
Receptors	Alpha-1	down regulated	PFC, TC, CN
	Alpha-2	up regulated in drug-free subjects down regulated in antidepressant-treated subjects	HIP, FC, LC, HTH OC, HIP
	Alpha-2A	up regulated in drug-free subjects down regulated in antidepressant treated subjects	EC, HTH, PEE AN, CN
Enzymes	Beta	up regulated	PFC, TC
	Alpha-2 'Beta ratio	increased	G
	TH	up regulated	LC
DOPAMINERGIC			
Dopamine turnover	Dihydroxy- phenylacetic acid concentration	decreased	CN, P. NA
GLUTAMATERGIC			
Receptors	NMDA	down regulated	G
	AMPA	Zinc inhibition decreased up regulated	HIP CN
GABA-ERGIC			
Receptors	GABA	up regulated	FC
ENDOCANNABINOID			
Receptors	CB(1)	up regulated	PFC

Table 3: Cell-signaling in suicide (Furucyz⁵⁰)

System element		Change	Location
Adenylate cyclase			
Protein kinase A	Enzyme activity	decreased	PFC, HIP
	Enzyme subunits RII, C3 levels	decreased	PFC, adult suicides
	Enzyme subunits Rkt, R113 levels	decreased	PFC, teenage suicides
2nd messenger cAMP effector	Enzyme substrate Rap- 1	reduced activation	PFC, HIP
	cAMP level	increased	PC, CN
	Epac-2 level	increased	PFC, HIP
	CREB level	decreased increased	PFC, HIP PFC, antidepressants-free subjects
		increased density of CREB stained cells	AN
Phospholipase C			
Protein kinase C	Enzyme	activity decreased	PFC, HIP, teenage suicides
	Enzyme substrate MARCKS	increased concentration, decreased phosphorylation	PFC, HIP
Second messenger	IP3 level	increased	HIP, CN
Cytokines			
Interleukins	IL-1β level	increased	FC, teenage suicide
	IL-3 level	increased	PC, female suicides
	IL-4 level	increased	FC, female suicides
	IL-6 level	increased	PC, teenage suicide
	IL-13 level	increased	PC, male suicides
TNF-Family	TNF-α level	increased	PC, teenage suicide

Table 4: Suicides by Causes in India during 2012 (NCRB, 2012)¹

Sl. No	Cause	Suicide in %
1	Family Problems	25.6
2	Illness	24.0
	(i) AIDS/STD	0.4
	(ii) Cancer	0.5
	(iii) Paralysis	0.4
	(iv) Drug Abuse/Addiction	3.3
	(v) Insanity/Mental Illness	6.4
	(vi) Other Prolonged Illness	13.0
3	Love affairs	3.2
4.	Bankruptcy or Sudden change in Economic Status	2.0
5.	Poverty	1.9
6	Failure in Examination	1.9
7	Dowry Dispute	1.6
8	Unemployment	1.4
9	Property Dispute	1.0
10	Fall in Social Reputation	0.8
11	Suspected/Illicit Relation	0.8
12	Professional/Career Problem	0.8
13	Cancellation/Non-Settlement of Marriage	0.7
14	Death of Dear Person	0.7
15	Not having Children(Barrenness/Impotency)	0.5
16	Divorce	0.2
17	Physical Abuse (Rape, Incest etc.)	0.2
18	Ideological Causes/Hero Worshipping	0.1
19	Illegitimate Pregnancy	0.1
20	Other Causes	17.3
21	Causes Not known	15.1
	Total (All India n=135,445)	100.0

REFERENCES

- National Crime Records Bureau. Accidental deaths and Suicides in India 2112. Ministry of Home Affairs: New Delhi; 2113.
- Jacobs DG, Baldessarini RJ, Conwell Y, Horton L et al. Suicide behavior practice guidelines for assessment and treatment of patients with suicidal behavior. *American Journal of Psychiatry*, 2003; 160: 3-60.
- Durkheim E. *Suicide: A study in sociology*. Routledge & Kegan Paul: London; 1970.
- Baechler J. *Suicides*. Blackwell: Oxford; 1979.
- Taylor S. *Suicide*. Longman: London; 1989.
- Petzel SV, Riddle M. Adolescent suicide: Psychosocial and cognitive aspects. *Adolescent Psychiatry*, 1981; 9: 342-98.
- Jobs DA. Collaborating to prevent suicide: A clinical-research perspective. *Suicide and Life-Threatening Behavior*, 2000; 30: 8-17.
- Hendin H. Youth suicide: A psychosocial perspective. *Suicide and Life-Threatening Behavior*, 1987; 17: 151-165.
- Lester D. Youth suicide: A cross-cultural perspective. *Adolescence*, 1988; 23: 955-58.
- Lester D. One theory of teen-age suicide. *Journal of School Health*, 1988; 58: 193-94.
- Lester D. The quality of life and suicide. *Journal of Social Psychology*, 1984; 125: 279-80.
- Joiner T. Supplementary application, part 3: Statement of plans. Unpublished portion of J.S. Guggenheim Memorial Foundation award application; 2003.
- Joiner T. The three components of completed suicide. Keynote address at the Annual Conference of the American Association of Suicidology, Miami, FL; 2004.
- Stack S. Suicide: A 15 year review of the sociological literature. Part 1: Culture and economic factors. *Suicide and Life-threatening Behavior*, 2000; 30: 145-62
- Freud S. Mourning and Melancholia. In: Strachey J, editor. *The standard edition of the complete works of Sigmund Freud*. London: Hogarth Press; 1957. p. 237-60.

16. Friedman M, Glasser M, Laufer E, Laufer M, Wohl M. Attempted suicide and self-mutilation in adolescence: some observations from a psychoanalytic research project. In: Maltzberger JT, Goldblatt MJ, editors. *Essential Papers on Suicide*. New York, NY: New York University Press; 1996. p. 259-68.
17. Menninger K. *Man against himself*. New York: Harcourt Brace; 1938.
18. Zilboorg G. Suicide among civilized and primitive races. *American Journal of Psychiatry*, 1936; 92: 362.
19. Leenaars AA. *Suicide Notes: Predictive Clues and Patterns*. New York, NY: Human Sciences Press; 1998.
20. Klein M. *Contributions to Psychoanalysis, 1921-1945*. London: Hogarth Press; 1948.
21. Adler A. Suicide. *Journal of Individual Psychology*, 1958; 14: 57-61.
22. Green MR. Suicide: The Sullivanian point of view. In: Farberow N L, Shneidman E S, editors. *The cry for help*. New York: McGraw-Hill; 1961. p. 220-235.
23. Wahl CW. Suicide as a magical act. In E. S. Shneidman and N. L. Farberow (Eds.), *Clues to suicide*. New York: McGraw-Hill; 1957. p 22-30.
24. Rojtenberg SL. Death as a way out. *World Psychiatry*, 1995; 3: 2-5.
25. Shapiro ER, Freedman J. Family dynamics of adolescent suicide. *Adolescent Psychiatry*, 1987; 14 : 271-290.
26. Emery PE. Adolescent depression and suicide. *Adolescence*, 1983 ; 18: 245-258.
27. Richman J. *Family therapy for suicidal people*. New York: Springer; 1986.
28. Weissman MM, Paykel ES, Klerman GL. The depressed woman as a mother. *Social Psychiatry*, 1972; 7: 89-108.
29. Neuringer C. Rigid thinking in suicidal individuals. *Journal of Consulting and Clinical Psychology*, 1964; 76: 91-100.
30. Shneidman ES. Suicide. In: Shneidman ES, editor. *Death: Current perspectives* Palo Alto, CA: Mayfield Publishing; 1980. p. 416-34.
31. Shneidman ES. *Definition of Suicide*. New York: Wiley; 1985.
32. Williams JMG. *Suicide and attempted suicide*. Penguin: London; 2001.
33. Kessler RC, Borges G, Walters EE. Prevalence of and risk factors for lifetime suicide attempts in the National Comorbidity Survey. *Archives of General Psychiatry*, 1999; 56: 617-25.
34. Drake RE, Cotton PG. Depression, hopelessness and suicide in chronic schizophrenia. *British Journal of Psychiatry*, 1986; 148: 554-9.
35. Iqbal Z, Birchwood M, Chadwick P, Tower P. Cognitive approach to depression and suicidal thinking in psychosis. 2. Testing the validity of a social ranking model. *British Journal of Psychiatry*, 2000; 177: 522-8.
36. O'Connor RC. Suicidal behavior as a cry of pain: Test of a psychological model. *Archives of Suicide Research*, 2003; 7: 1-12.
37. Beck AT, Kovacks M, Weissman A. Hopelessness and suicidal behavior: An overview. *Journal of the American Medical Association*, 1975; 234: 1146-1149.
38. Beck AT. Beyond belief: A theory of modes, personality, and psychopathology. In: Salkovskis P, editor. *Frontiers of Cognitive Therapy*. New York: Guilford Press; 1996. p. 1-25.
39. Rudd MD, Joiner T, Ralph MH. *Treating suicidal behavior: An effective time limited approach*. New York: Guilford Press; 2001.
40. Ellis A, Ellis TE. Suicide from the perspective of rational emotive behavior therapy. In: Ellis TE, editor. *Cognition and Suicide*. Washington: American Psychological Association; 2006. P. 75-90.
41. Mann JJ, Waternaux C, Haas GL, Mallone KM. Towards a clinical model of suicidal behavior in psychiatric patients. *American Journal of Psychiatry*, 1999; 156: 181-189.
42. Williams JMG, Pollock L. Psychological aspects of the suicidal process. In: Van Heeringen C, editor. *Understanding suicidal behavior: the suicidal process approach to research, treatment and prevention*. Chichester: Wiley; 2001.
43. Haw C, Houston K, Townsend E. Psychiatric and personality disorders in deliberate self-harm patients. *British Journal of Psychiatry*; 2001; 178: 48-54.
44. Overholser JC, Stockmeir C, Dilley G, Freiheit S. Personality disorders in suicide attempters and completers: preliminary findings. *Archives of Suicide Research*, 2002; 6: 123-33.
45. Van Praag HM, Van Os J, Kloet D. *Stress, the brain and depression*. Cambridge UK: Cambridge University Press; 2004.
46. Houston K, Hawton K, Shepperd R. Suicide in young people aged 15-24: A psychological autopsy study. *Journal of Affective Disorders*, 2001; 63: 159-70.
47. Beautrais AL, Joyce PR, Mulder RT. Personality traits and cognitive styles as risk factors for serious suicide attempts among young people. *Suicide and Life-Threatening Behavior*, 1999; 29: 37-47.
48. Turecki G. Dissecting the suicide phenotype: the role of impulsive-aggressive behaviours. *Journal of Psychiatry & Neuroscience*, 2005; 30: 398-408.
49. Apter A. Personality constellations in suicidal behavior. *Proceedings of the 5th Annual Conference, Irish Association of Suicidology, Castlebar, County Mayo, Ireland: Irish Association of Suicidology*; 2000. p. 14-25.
50. Furczyk K, SchutováB, Miche TM, Thome J, Büttner A. The neurobiology of suicide - A Review of post-mortem studies. *Journal of Molecular Psychiatry*, 2013; 1:2. [cited 2013 Aug 8]. Available from: <http://www.jmolecularypsychiatry.com/content/1/2>

51. Pandey GN. Altered serotonin function in suicide. Evidence from platelet and neuroendocrine studies. *Annals of the New York Academy of Sciences*, 1997; 836: 182-3.
52. Flory JD, Mann JJ, Manuck SB, Muldoon MF. Recovery from major depression is not associated with normalization of serotonergic function. *Biological Psychiatry*, 1998; 43: 320-6.
53. Mann JJ, Arango V. Neurobiology of suicidal behavior. In: Jacobs DG, editor. *The Harvard Medical School guide to suicide assessment and intervention*. San Francisco, CA: Jossey-Bass; 1998. p. 98-114.
54. Kaplan JR, Muldoon MF, Manuck SB, Mann JJ. Assessing the observed relationship between low cholesterol and violence-related mortality. Implications for suicide risk. *Annals of the New York Academy of Sciences*, 1997; 836: 57-80.
55. Oquendo M, Placidi GPA, Malone K M, Campbell C, Keilp J, Brodsky B, et al. Positron emission tomography of regional brain metabolic responses to a serotonergic challenge and lethality of suicide attempts in major depression. *Archives of General Psychiatry*, 2003; 60: 14-22.
56. Audenaert K, van Laere K, Dumont F, Slegers G, Mertens J, Van Heeringen C, et al. Decreased frontal serotonin 5-HT_{2A} receptor binding index in deliberate self harm patients. *European Journal of Nuclear Medicine*, 2001; 28: 175-82.
57. Van Heeringen C, Audenaert K, Van de Wiele L, Verstraete A. Cortisol in violent suicidal behavior: association with personality and monoaminergic activity. *J. of Affective Disorders*, 2000; 60: 181-9.
58. Arato M, Banki CM, Bissette G, Nemeroff C.B. Elevated CSF CRF in suicide victims. *Biological Psychiatry*, 1989;25: 355-9.
59. Coryell W, Schlessler M. The dexamethasone suppression test and suicide prediction. *American Journal of Psychiatry*, 2001; 158: 748-53.
60. South African Depression and Anxiety Group. South Africa. Awareness campaign to prevent suicide. [Cited on 2006 Oct 17]. Available from: <http://www.health24.com/child/Emotions.behaviour/833-854,26682.asp>.
61. Mahon MJ, Tobin JP, Cusack, DA, Kelleher C, Malone KM. Suicide among regular duty military personnel: A retrospective case control study of occupation-specific risk factors for work place suicide. *American Journal of Psychiatry*, 2005; 162: 1688-96.
62. Runeson B, Asberg M. Family history of suicide among suicide victims. *American Journal of Psychiatry*, 2003;160:1525-6.
63. Brent DA, Agerbo M, Oquendo, et al. Peri pubertal suicide attempters with siblings concordant for suicide behaviour. *American Journal of Psychiatry*, 2003; 160:1486-93.
64. Masango SM, Rataemane ST, Motojesi AA, Suicide and suicide risk factors: A literature review. *SA Fam Pract*, 2008; 50(6): 25-8.
65. Yamada T, Kawanishi C, Hasegawa H, Sato R, Konishi A, Kato D, Furuno T, Kishida I, Odawara T, Sugiyama M, Hirayasu Y. Psychiatric assessment of suicide attempters in Japan: a pilot study at a critical emergency unit in an urban area. *BMC Psychiatry*, 2007; 7: 64-71.
66. Mann JJ. A current perspective of suicide and attempted suicide. *Annals of Internal Medicine*, 2002;136: 302-11.
67. Harris EC, Barraclough B. Suicide as an outcome for mental disorders: a meta-analysis. *British Journal of Psychiatry*, 1997; 170: 205-28.
68. Wulsin LR, Vaillant GE, Wells VE. A systematic review of the mortality of depression. *Psychosomatic Medicine*, 1999; 61: 6-17.
69. Ohberg A, Vuori E, Ojanperä I, Lonnqvist J. Alcohol and drugs in suicides. *British Journal of Psychiatry*, 1996; 169: 75-80.
70. Inskip HM, Harris EC, Barraclough B. Lifetime risk of suicide for affective disorder, alcoholism and schizophrenia. *British Journal of Psychiatry*, 1998; 172: 35-7.
71. Cheng ATA. Mental illness and suicide. A case-control study in East Taiwan. *Archives of General Psychiatry*, 1995; 52: 594-603.
72. Foulon C, Guelfi JD, Kipman A, Adès J, Romo L, Houdeyer K, Marquez S, Mouren MC, Rouillon F, Gorwood P. Switching to the bingeing/purging subtype of anorexia nervosa is frequently associated with suicidal attempts. *European Psychiatry*, 2007; 22: 513-9.
73. Appleby L, Dennehy J, Thomas C, Faragher B, Lewis G. Aftercare and clinical characteristics of people with mental illness who commit suicide: a case control study. *Lancet*, 1999; 353: 1397-400.
74. Powell J, Geddes J, Deeks J, Goldacre M, Hawton K. Suicide in psychiatric hospital in-patients. Risk factors and their predictive power. *British Journal of Psychiatry*, 2000; 176: 266-72.
75. Hughes D, Kleespies P. Suicide in the medically ill. *Suicide Life Threatening Behavior*, 2001; 31 (suppl): 48-59.
76. Suominen K, Isometsa E, Heila H. General hospital suicides- a psychological autopsy study in Finland. *General hospital Psychiatry*, 2002; 24: 412-16.
77. Davidson L. Suicide and aggression in the medical setting. In: Stoudemire A, Forgel B, editors. *Psychiatric care of the Medical Patient*. New York: Oxford University Press; 1993. P. 71-86.
78. Parkar S, Dawani V, Weiss M. Gender, Suicide, and the Sociocultural Context of Deliberate Self-Harm in an Urban General Hospital in Mumbai, India. *Culture, Medicine & Psychiatry*, 2008; 32: 492-515.

Source of support: Nil, Conflict of interest: None Declared