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Suicide, A Dangerous Multidimensional Epidemic

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ABSTRACT

As, German philosopher Friedrich Nietzsche said "*the thought of suicide is a great consolation: by means of it one gets through many a dark night",* Suicide is the same going in the current scenario. Today, this epidemic cause of death of ending ones own life to get rid of society one own duties and hence makes a coward a press material. The thought of suicide is more killing than doing suicide itself, as a person dies more than hundred times thinking about it. Today's youth or the upcoming generation, where the so-called modern lifestyle prevail has stopped thinking and doing work in a psychological manner of living it life more beautifully, instead choose the way of ending ones own life. It never matters to someone or the society how you were living or you die but when one attempts suicide then have to face the cruel society with hatredness and grief. Yes, but who forced one to take a bold step like this, or it was the only fault of the victim who faced it. A number of questions and a number of answers what a suicide victim faces, what was/ is his current mind needs to be discussed. What are the faults of the society, the victim, etc. all these answers begin with the modern lifestyle we are leading to. An American author Jeannette Walls said "*when people kill themselves they think they are ending the pain, but all they're doing is passing it on to those they leave behind".* Continuing with all these topics and combining all in one is the main theme of this paper with the therapeutic ways of treatment of suicide victims. The way suicide is hence prevailing in this time would change several genetic materials, genome and can cause suicide as a epigenetic disease at sometime in the coming era as diabetes in this scenario.

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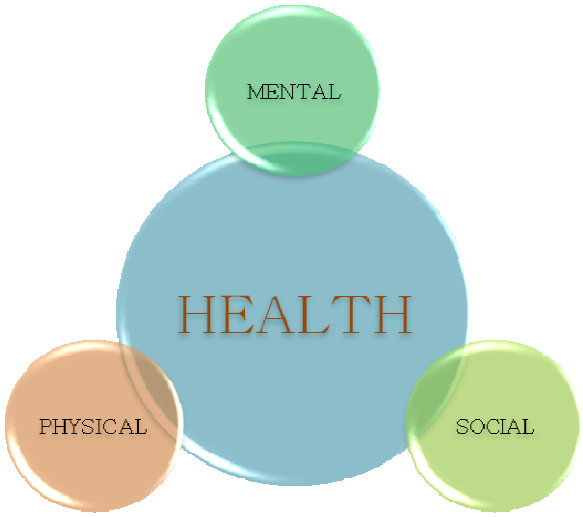
INTRODUCTION:

The 21st century, the era of science & competition; the era of so-called modern lifestyle, which is qualified by several unavoidable gifts like 'ignorance', 'arrogance', 'compromization', 'hyper-materialistic mentality' 'Disguise' & 'hyper-individualistic freedom'. These characteristics of modern lifestyle are inevitably accompanied by anger, violence, complexes, broken down condition, depression, hopelessness and resistance. In this disturbed time, all are running behind a virtual satisfaction with the sacrifice of quality of living in true sense. This modern time can be categorized as the 'time of whimsical mentality' or the 'time of virtuality' or the 'time of false ideologies'. In this modern civilization, the society receives a good number of experiences along with many new diseases and defects which can harm the entire society. Along with different physical pathologies all are adopting enumerable negative psychological habits in the name of good habits or advanced habits or concerned practice or habits due to advancement of time. In majority of the cases, people are focusing on corporeal health, on the basis of laboratory investigations, physical notable pathological changes etc.; which are only the peak of an ice-berg. We are just focusing on the removal of the peak through our modern medical aid and technologies, but the unnoticed part is continuously growing under the depth of the water. According to the World Health Organization, *"Health is a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity."* Although WHO defined health as the balanced state of physical, mental & social well-being; but we are still focusing on the physical health only by ignoring other forms.



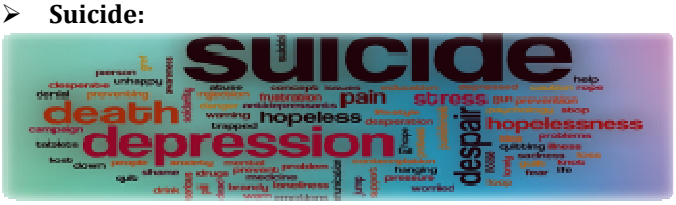
Life is not only a materialistic subject to study; rather it is an unrevealed truth of the nature, among which human life is most complicated one to understand. In the course of life, one may experience several impulses; it is true that among those impulses all are not good or soothing enough. There are many incidents one has to face which are extremely life-threatening in nature. In life, another interesting subject of discussion is 'health'. Maintenance of health is the only goal to reach for the betterment of nature. In today's overtly modern time, we are running behind that health, which is not at all considered as health ideally, rather that can be easily termed as 'Corporate health'; where the entire system is misleading by

different professionals as per their money making cheap business guidelines. This trend is continuously injecting the poisons of different varieties within our body, mind & soul. Maintenance of health means avoidance of disease or any kind of damaging influence, which can disturb the health of an individual. Maintenance of health is not only an important issue, rather it is a tough job, because it includes promotion of the healthy habits, healthy choices, healthy food habit, healthy thought, disease free life, avoidance of infections, avoidance of genetic disturbances, avoidance of natural pollutants etc & educate the society in an unbiased and scientific education. Hyper-concerned nature about diseases without focusing on the basics of a healthy life is nothing but the promoting pathologies in an indirect manner. Before going to deeper we have to consider basic concepts of society, because society is an important key factor for all kinds of pathologies.

Society is the harmonious condition of a group of similar species (human, cats, dogs, ants etc.), where they are living with interpersonal understanding, sharing and responsibility; guided by a well-defined principle. Generally, we are stating that, humans are the only social animal, but actually each & every living being have their own society. Although what we consider as a society, that is obviously not what a society actually is, rather we have designed a virtual image of society around us, just to dominate others and to compromise with ourselves. For some species, society is geographical area dependent, in some cases occupation dependent, even some cases society is purely ideology dependent. For a better life, healthy social environment is very much important, just like our person-centered environment. But, if one can observe the current scenario of the society, then he/she can encounter 'violence' as a principal problem of now days, because violence is now everywhere. Among different forms of violence, one can able to observe the scarring outcome of violence, i.e. **'Suicide'**.

Suicide is a major public health issue of this recent time, and constitutes a significant cause of death worldwide. Suicide accounts for about 12% deaths in the Asian countries. In a consistent finding across cultures, the rates of completed suicides are higher in males than in females. Attempted suicide occurs with greater frequency than completed suicide, with a lifetime prevalence of approximately 9.5%, and it has been estimated that up to 10% of suicide attempters will commit suicide within 10 years. Suicide is now become a coward way out to get rid of any difficulties. But it is not completely true. Suicide is now become a virulent genetic disorder like addiction, where a person shows suicidal behaviour from their birth. Actually, we are used to ignore many disharmonious impulses consciously, by considering those as harmonious forcefully; but our body being an auto-regulated instrument is capable of identify those impulses & act accordingly. Those changes may results into a serious pathology in the future. Suicide is also that kind of result of our ignorance. Suicide or self-harming behaviours have become an integral part of our daily life.

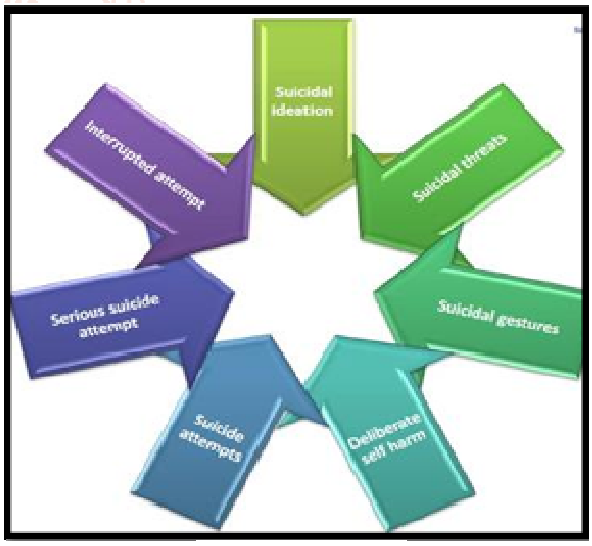
- **Suicide:**



Suicide, comes from the Latin word 'Suicidium'; is the combination of 'Sui' & 'caedere', which collectively give the English word "Kill oneself". Suicide is the act of taking one's own life. There are various kinds of suicide, so our prime task is to clarify our use of the term. Here suicide can be used in conventional sense, in which a person plans out or acts upon self-destructive thoughts and feelings, often while they are experiencing *'overwhelming stress'*. According to Willey's dictionary, *"Suicide is killing oneself on purpose, dying at one's own hand, voluntarily or involuntarily."*

The intent of suicidal behaviour whether consciously or unconsciously motivated, is to permanently end one's life or to attract attraction towards them with a latent expectation to regain the lost position for what they have choose to commit suicide. There are few terms we have to discuss in the following portion- Suicidal Gestures, Suicidal ideation etc.

Views on suicide have been influenced by broad existential themes, such as religion, honor & meaning of life. The Abrahamic religions traditionally consider suicide as an offense towards god, due to the belief in the sanctity of life. During the Samurai era in Japan, a form of suicide known as 'Seppuku (Harakiri)' was respected as a means of making up for failure or as a form of protest.



Suicide Spectrum

- **Aetiology of Suicide:**

Main cause of suicide will be 'Violence', 'Stress', and 'Expectation-performance-demand mismatch'. These psycho-social factors which plays important roles in the development of these monsters, are as follows:

- **To get instant reward from a group of people-**

It is the prime cause for violence. Reward is the most sensitive expectation one expects. People generally indulged in several works to get reward in any form.

- **Lack of understanding of the family members-**

Family members, especially guardians always develop themselves as the bosses of the person, in spite of becoming guard. Guardians, especially of Indian society generally followed the paths as they developed, as they received behaviours from their guardian, which is extremely making no sense. There is a mentality one can easily encounter from the guardian's side, i.e. they thought that as they are spending money for the child, then they have the right to

direct their children. *But is this an ideal character of guardians or the character of masters & buyers? Are guardians permeable to buy the dreams of their children?* This behaviour is absolutely of no sense and violence in itself.

➢ **Extreme level of person-centered mentality-**

It is one of the common causes of violence in the modern civilization, where the society has developed a wrong notion about self-centered mentality; where people is there to destroy by the name of enjoyment their lives, by considering themselves as an individual entity only, rather to consider themselves as social entities.

➢ **Unnecessary bossing tendency-**

It is an epidemic in itself.

➢ **Resistance-**

Resistance is a defense mechanism of the mind. It is such a quality of mind, where a person stopped themselves to accept anything, any idea or any amendment.

➢ **Rigidity-**

Rigidity is a defense mechanism of mind, where a person get satisfied or get reward by showing pride or virtual attitude towards their subordinates. This is one of the identifying feature of half-hearted masters, because they generally create a sphere of anger, misbehavior e.t.c. to repulsed people from their side. People who are virtually used to show rigidity, they are basically coward & half-hearted knowledgeable masters.

➢ **Superiority complex-**

Superiority complex is an inflated estimate of one's own merit, usually manifested in arrogance. Superiority complex is manifested by the followings-

- Haughtiness- possess the quality of being arrogantly superior and disdainful.
- They are always right, others are always wrong
- Interested to speaking only, not to listen
- Declared themselves as outspoken person
- If one disagreed with them, they can declare that person as idiot.
- Lack of empathy
- Tendency to brag
- Interrupting mentality
- Anxiety
- Mood swing
- Unnecessarily judgmental

➢ **Inferiority complex-**

Inferiority complex is an acute sense of personal inferiority often resulting either in timidity or through overcompensation in exaggerated aggressiveness. There are several symptomatologies of inferiority complex, some are as follows-

- Sudden social withdrawal
- Tendency to demeaning others
- Blaming the universe for every disasters
- Sour grapes
- Lack of sportsmanship
- Extreme level of emotional sensitivity
- Attention seeking nature
- Fear of loss of reason
- Fear of mistakes

➢ **Ego-**

Ego is the part of our personality that functions as a mediator of the internal Id and the external environment. *The Id is the part of the personality that we are born with.*

➢ **Ill-defined goal-**

Goal is something for which a person struggles. One can say goal is the destination to which a person is running throughout their life till they achieved their goal. Well-defined goal can make a person satisfactory successful in his or her life; simultaneously ill-defined goal can results into irritation, anxiety, dissatisfaction, compromization, broken-down condition, frustration and fear. These can collectively contribute in the formation of violence.

➢ **Lack in ideology-**

Ideology or principle, a necessary component of one's life and very much important for one's survival. It is the binding element of life, which shaped our lives in a decorated manner. Ideology must be clearly defined and must be free from any biasness & prejudice. Ideology is the main directing force of one's life. Lack of clearly defined ideology is one of the important contributing factors of this ultra-modern society. A group of dull-headed people explained ideology as the strangulating force, just to disorganize a healthy social structure in an intentional manner. For that purpose people used to devoid from any ideologies to maintain a 'casual' & 'cool' character.

➢ **Copy-paste mentality-**

Copy- paste mentality is an unavoidable outcome of 'ill-defined goal' & 'lack of ideology', where persons are very much busy to follow social trends, without considering their capacity & capability. This is one of the prime cause of 'unemployment'; due to overusing in one field. The productivity of the society also damaged due to this mentality. This mentality is one of the contributing component of this ever-increasing rate of violence, because now a days one can easily encountered, ***"Wrong person in Wrong place".***

➢ **Tendency to take short-cuts to succeed-**

Due to 'ill-defined goal', 'lack of ideology' & 'copy-paste mentality' people choose short-cuts to earn money by hook or crook. But this tendency results into compromised productivity, substandard out-come, short-lasting success, long-lasting dissatisfaction, inferiority complex, superiority complex; these collectively develop violence in a larger scale.

➢ **Unwanted and unnecessary competitive mentality-**

One of the important contributing factors of violence. This poison is injected in the blood from the childhood periods of a person. This mentality teaches a child to ignore, to hate, not to believe, not to help, not to consider, not to care and to left self-centered. Although short-termed virtual individual satisfaction can be reached through this mentality, but with the compromization of gross-social productivity. To reach this self-centered distorted successful state people starts to adopt different logical or illogical paths, which eventually destroyed the entire scenario of an age.

➢ **Compromization with dream-**

Due to over- concerning, over-lovable or ignorant guardians, many people are forced to compromise with their dream; just to satisfy the devil bossing soul of the so-called

guardians. This results into dissatisfaction, underrated products, decreasing creativity, irritability, frustration, resistance, anger. Depression, dependency on abusive substances, broken-down condition, quitting mentality, disbelief, disrespect, hatred and withdrawal. These are the contributing factors of this ever-increasing scenario of several types of violence.

- **Faulty understanding & perception-**

This results into several sexual & gender related violence, religious violence, domestic violence & cultural violence.

- **To control somebody or something as per one's own will**
- **Superimposing one's idea upon others**

- **Negative publicity by the media-**

This is another important aetiological factor of violence in the context of modern time. Human mind is a very complicated subject. Mind gets easily attracted towards the negative impulses or events without considering their adverse effects or outcomes. Media have focused on this trend in order to get their TRP. Promotion of negative news, negative events, violent incidents contribute in several forms of violence.

- **Poverty & Economic compromization**
- **Abusive substances- Explained later.**

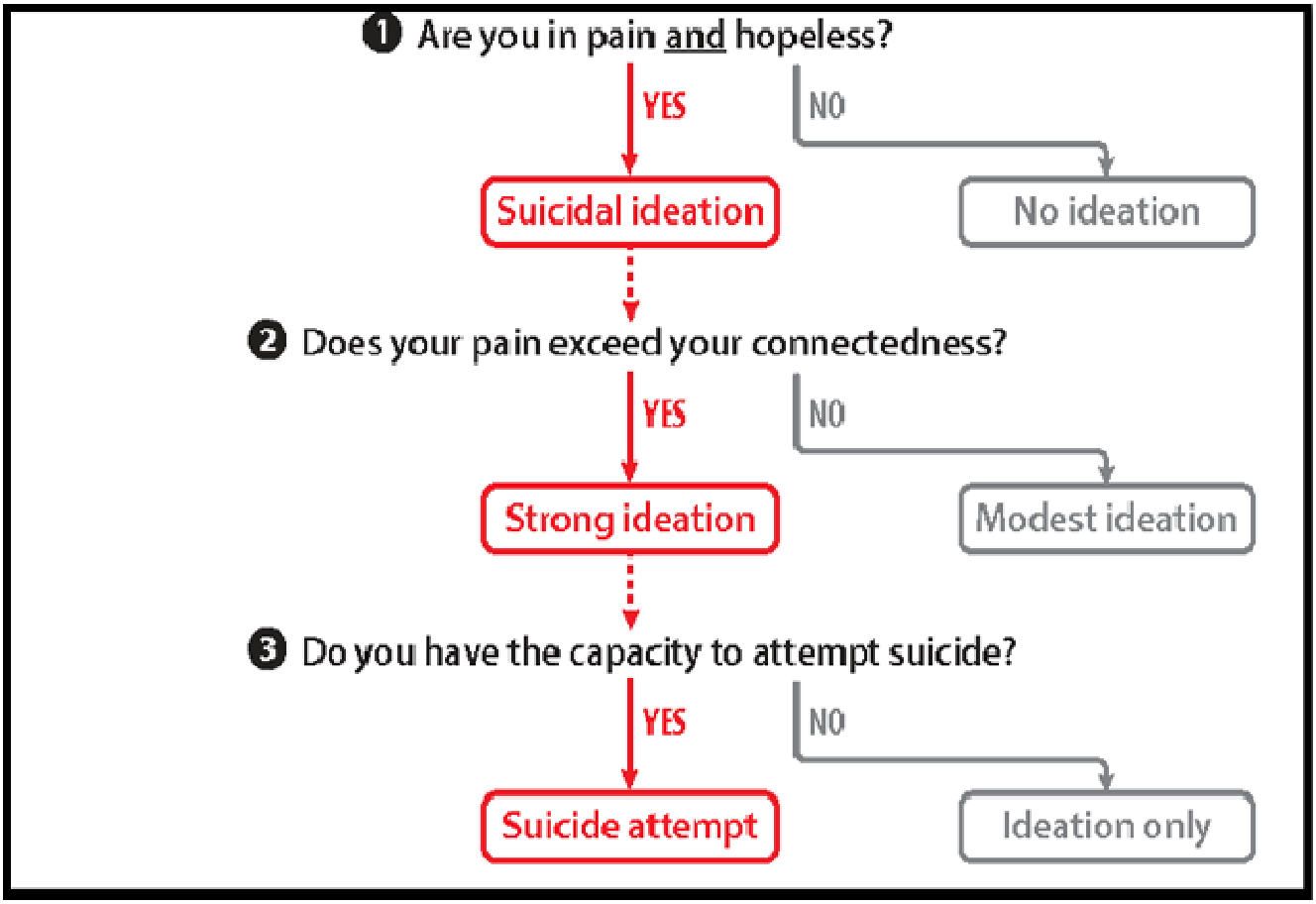
Apart from the psychological background, neuro-endocrinal system also plays an important role in the aggression, violence and behavioral modifications. Level & type of aggression & violence is different in children, teenagers & adolescents. For better understanding it is necessary to take a snap from the neuro-endocrinal framework of the brains of teenagers & adolescents.

- **Suicidal Ideation:**

Suicidal ideation, is also known as 'Suicidal thoughts', is the thinking, considering and or planning of a suicide. Suicidal ideation is a term, used by the mental health professionals to describe suicidal thoughts & feelings without suicidal actions. The presence of suicidal ideation, occurring alone in the absence of any plans to act out actual suicide, anchors the low or less dangerous end of the suicide risk continuum. The potential for someone engaging in suicide is still there, but the risk is not acute.

Even though suicidal ideation is considered as less serious than the actual suicide attempts, but is should be kept in mind that, it must be the real cause of suicide one must have to concern. The fact that suicidal ideation is occurring at all suggests a very real possibility that suicide could occur should circumstances become worse & stress levels mount. Persons with suicidal ideation are at high risk of actual suicidal attempts.

A further problem is that, once suicidal ideation has become established, it can become a 'cognitive habit', something that reappears periodically & spontaneously during times of stress and anxiety as an automatic & habitually negative dysfunctional style of thinking. Such dysfunctional automatic thinking styles are especially common in people with depression or who are in trauma or in broken down condition. Continuous presence of these dysfunctional thoughts can develop *'suicidal gestures'* automatically within these patients. Suicidal ideation can be considered as *identifying feature for a future suicidal event.*



The Three step theory (3ST) of Suicide

➢ **Questions to Encounter Suicidal Intents:**

A general question about the person's thoughts and feelings about living is frequently a recommended start to this discussion:

- Sometimes people feel that life is not worth living. Can you tell me how you feel about your own life?
- What are some of the aspects of your life that make it worth living?
- What are some of the aspects of your life that may make you feel or think that your life is not worth living?
- Do you find yourself wishing for a permanent escape from life?
- How would that happen for you? What might you do to achieve that?

It is important to continue with additional questions that are actually about self-harm, suicide and death.

- Do you think about your own death or about dying?
- Have you ever thought of harming yourself or trying to take your own life?
- Do you think or feel this way presently?

If the person expresses thoughts of self-harm, and /or suicide, or even if he/ she seems ambivalent (e.g. says "I don't know," or "I don't remember" or "maybe, I am not sure" or "sometimes, but not right this moment"), continue with these questions:

- When did you begin to experience these thoughts and feelings?
- What happened before you had them?
- Were there events in your life that preceded this such as a sudden loss or feelings of depression?
- How frequently have you had these thoughts and feelings?
- Do these thoughts intrude into your thinking and activities?
- How strong are they?
- Can you describe them?
- Can you stop yourself from having them by distracting yourself with an activity or other more positive thoughts?
- Have you ever acted upon these thoughts?
- Do your thoughts command you to act upon them?
- If you have not acted upon them, how close do you feel you came to acting?
- What stopped you from acting on them?
- Have you ever started to act on your self-harm or suicidal thoughts, yet stopped before actually doing it? For example, did you hold a bottle of pills in your hand to take them all but stopped, or go out on a ledge to jump but then stopped?
- Do you think you might act on these thoughts of self-harm or suicide in the future?
- What might help you from acting on them?
- If you did take your own life, what do you imagine would happen after you die to those people who are important to you?
- Do you have a plan to harm yourself or take your own life? If so, describe your plan.
- Do you have those methods available to you to take your life, such as over the counter pills, prescription pills, knives or proximity to a balcony, bridge or subway?
- Have you prepared for your death by writing a note, making a will, practicing the plan, putting your affairs such as your finances in order, or ensuring privacy such that you would unlikely be discovered?
- Have you told anyone that you are thinking about taking your life or are planning to do this?

If a person has attempted suicide or engaged in self-harm behaviour(s), ask additional questions to assess circumstances surrounding the event(s).

- What happened in your previous attempts to self-harm or take your life? What led up to it? Were you using alcohol or other substances? What method did you use? Sometimes people have many reasons for harming themselves in addition to wanting to die. What might have been some of your reasons for selfharm or suicide? How severe were your injuries?
- What were your thoughts just before you harmed yourself?
- What did you anticipate would be the outcome of your self-harm or suicide attempt? Did you think you would die? What did you think would be the response of others to your self-harm or suicide?
- Were other people present when you did this?
- How did you get help afterward? Did you look for it by yourself or did someone else help you?
- Did you anticipate that you might be discovered? If not, were you found accidentally?
- How did you feel after your attempt? Did you feel relief or regret at being alive?
- Did you receive treatment after your attempt? Did you get medical and/ or psychiatric, emergency help? Were you assessed in an emergency department? Were you cared for in an inpatient/outpatient department?
- How do you think and feel about your life now? Have things changed for you? Do you see your life in the same way or differently?
- Are there other times in the past when you've tried to harm (or kill) yourself? (If so you can re-ask many of these same questions to assess for similar or varying circumstances and presentations).

For individuals with repeated suicidal thoughts or attempts.

- How many times have you tried to harm yourself, or tried to take your life?
- When was the most recent time?
- What were your thoughts and feelings at the time that you were most serious about suicide?
- When was your most serious attempt at harming or taking your life?
- What happened just before you did this, and what happened after?

Assess reasons for living or protective factors for this person.

- How do you feel about your own future?
- What would help you to feel or think more positively, optimistically or hopefully about your future?
- What would make it more (or less) likely that you would try to take your own life?
- What happens in your life to make you wish to die or to escape from life?
- What happens in your life to help you to want to live?
- If you began to have thoughts of harming or killing yourself again, what would you do to prevent them?

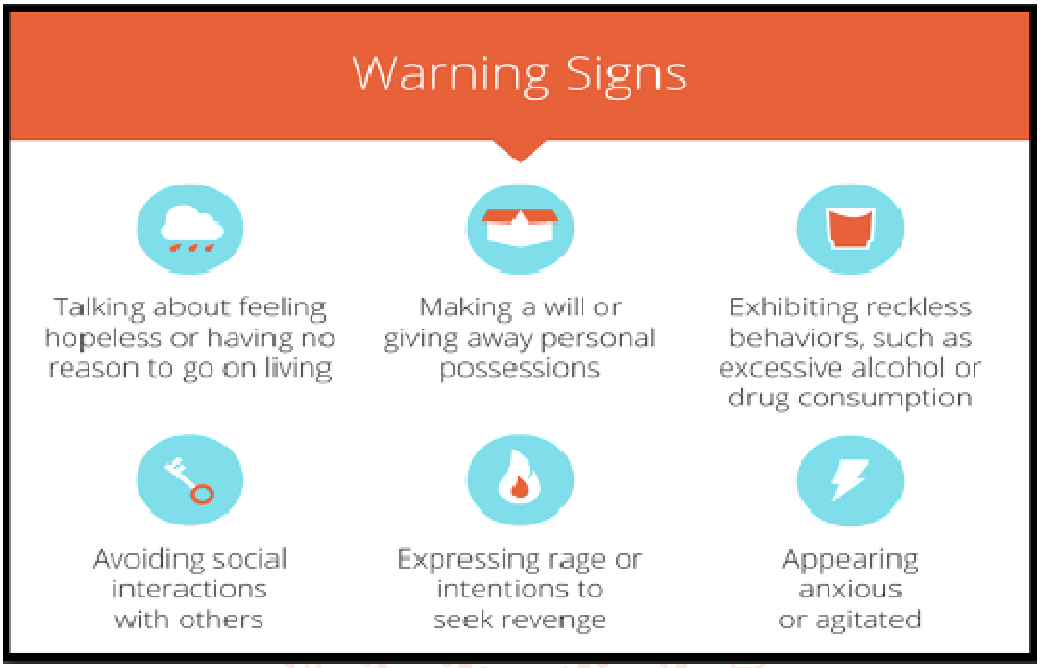
For individuals with psychosis, ask specifically about hallucinations and delusions.

- Can you describe the voices you hear?
- Can you tell if they are male or female?
- Can you stop the voices?
- How many different voices do you hear?
- Do you hear these voices from within your own mind, or do they seem to come from somewhere outside of you?
- Do you know who these voices are? Do you recognize them?
- What do the voices say to you? Do they say anything positive, or do they say negative or hurtful things to you? Do they threaten you or anyone else?
- How do you cope with the voices? Do you do anything about them?
- Do they command you to do anything? If so what kinds of things do they ask you to do?
- Have you ever done what the voices ask you to do? What led you to obey the voices? If you tried to resist them, what made it hard to do?
- Have there been times when the voices told you to hurt or kill yourself? How frequently has this happened? What happened?

Consider assessing the patient's potential to harm others in addition to him/ herself.

- Are you having any thoughts of harming other people?
- Are there other people you would want to die with you?
- Are there others who you think would be unable to go on without you?

➢ **Suicidal Gestures:**



Suicidal gesture is an intentional act suggesting a cry for help by causing physical self-harm or intending to cause physical self-harm. Suicidal gestures generally not going to terminate one's life if left unattended. Suicidal ideation is only dangerous to the extent that it motivates Suicidal planning & actions. Moving from thinking about suicide to considering a specific suicidal plan represents an increase in the level of suicidal-danger risk, no matters whether the plans made are concrete or vague, organized or haphazard. When suicidal actions occur, the level of suicide-danger risk increases.

Actual attempts to kill one's own self are labeled as 'suicidal gestures' or 'suicidal attempts' by the clinicians; no matter how ineffective those attempts may ultimately be. Suicidal gestures may be acted out with full lethal intent, or they may be acted out half-heartedly, more as a means of communicating the depths of one's pain to others around you than an actual effort to end one's life. Regardless of the intent and degree of seriousness that motivates them, suicidal gestures are often dangerous events.

Following are some of the possible warning signs that a person may be at risk for suicide:

- **Excessive sadness or moodiness**: Long-lasting sadness and mood swings can be symptoms of depression, a major risk factor for suicide.
- **Sudden calmness**: Suddenly becoming calm after a period of depression or moodiness can be a sign that the person has made a decision to end his or her life.
- **Withdrawal**: Choosing to be alone and avoiding friends or social activities also are possible symptoms of depression. This includes the loss of interest or pleasure in activities the person previously enjoyed.
- **Changes in personality and/or appearance**: A person who is considering suicide might exhibit a change in attitude or behavior, such as speaking or moving with unusual speed or slowness. In addition, the person might suddenly become less concerned about his or her personal appearance.
- **Dangerous or self-harmful behavior**: Potentially dangerous behavior, such as reckless driving, engaging in unsafe sex, and increased use of drugs and/or alcohol might indicate that the person no longer values his or her life.
- **Recent trauma or life crisis**: A major life crisis might trigger a suicide attempt. Crises include the death of a loved one or pet, divorce or break-up of a relationship, diagnosis of a major illness, loss of a job, or serious financial problems.

- **Making preparations**: Often, a person considering suicide will begin to put his or her personal business in order. This might include visiting friends and family members, giving away personal possessions, making a will, and cleaning up his or her room or home. Some people will write a note before committing suicide.
- **Threatening suicide**: Not everyone who is considering suicide will say so, and not everyone who threatens suicide will follow through with it. However, every threat of suicide should be taken seriously.

➢ **Relationship between Non-Suicidal Self Injury & Suicidal thoughts & behaviours:**

Despite the different intentions associated with non-suicidal self injury and suicidal thoughts and behaviors, it is important to note that they share common risk factors. These include but are not limited to:

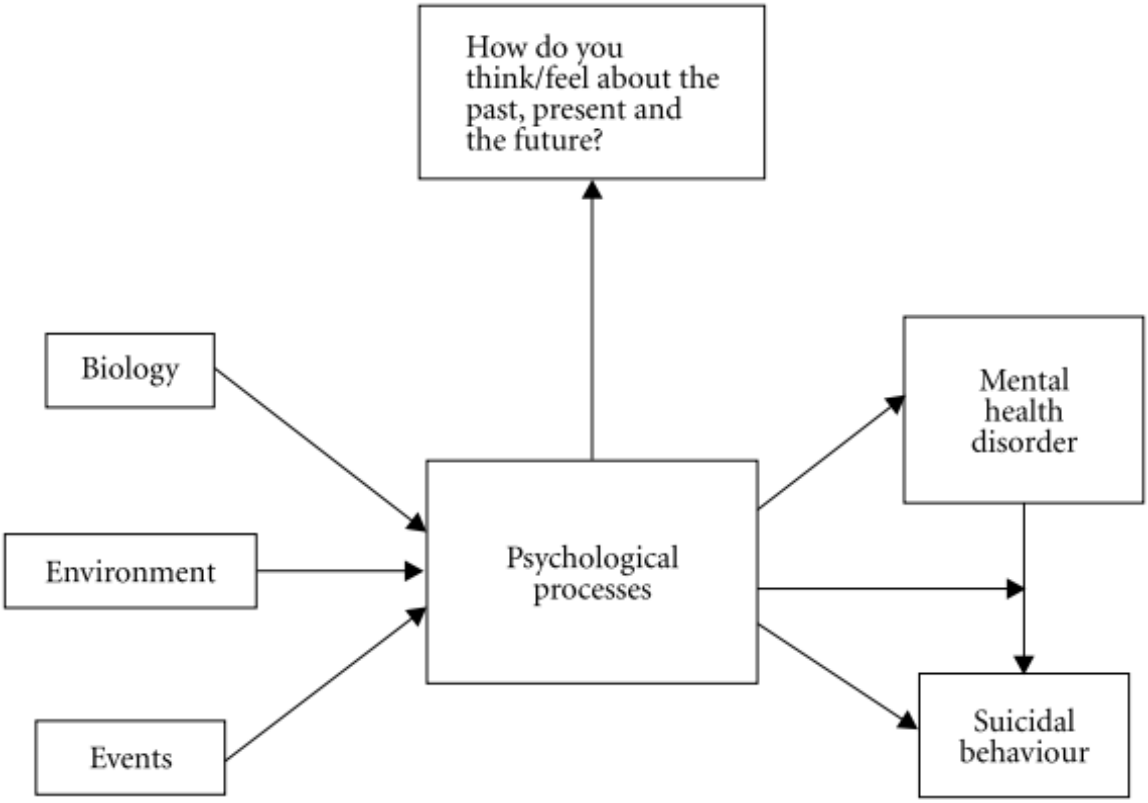
- History of trauma, abuse, or chronic stress
- High emotional perception and sensitivity
- Few effective mechanisms for dealing with emotional stress
- Feelings of isolation (this can be true even for people who seem to have many friends / connections)
- History of alcohol, tobacco or other substance abuse
- Presence of depression or anxiety
- Feelings of worthlessness Because of these and other risk factors, the presence of non-suicidal self injury is, in and of itself, a risk factor for suicide thoughts and behaviors.

Non-suicidal self-injury is typically used as a coping strategy for preserving and enhancing life; not ending one's life and to draw attention towards the subject. However, since non-suicidal self injury and suicidality both indicate underlying distress it is important to assess whether self-injurious youth are also suicidal. The National Institute of Mental Health lists key signs and signals in assessing whether a person is actively suicidal:

- Talking about wanting to die
- Looking for a way to kill, or making a plan to kill oneself
- Feeling hopeless or talking about having no way out
- Feeling trapped and as if there is no end to pain
- Expressing oneself as a burden to others
- Increased use of substances (drugs or alcohol)
- Anxious or agitated behavior
- Too much or too little sleep
- Withdrawing from family, friends, and important relationships
- Expressing extreme anger or rage
- Mood swings If someone in your life is displaying any of these warning signs, they should be responded to immediately and referred for professional evaluation and support.

❖ **Bio-Psycho-Social Model of Suicidal Behaviour:**

Biological, Environmental and Event factors contribute into a Psychological Process. This psychological process leads to the development or exacerbation of a mental health issue and to suicidal behaviour ultimately. On a cognitive level, this affects how the individual thinks and feels about the past, present and future.



❖ **Biological Influences in Suicide:**

There are a number of biological factors that can increase the risk of suicide, which include genetic predisposition of suicidal behaviour which may be related to increased prevalence of impulsiveness and aggressiveness.

5HT receptors are receptors in the brain that are activated by the neurotransmitter serotonin. Serotonin plays an important role in mood, appetite and eating, sleep, memory and sexual function. Improperly functioning 5HT receptors may play a role both in depression and in suicidal behavior.

Teens & adolescents are more impulsive than the adults, hence they are more vulnerable to the emotional upsetting impulses & suicidal behaviours. From this study, w have encountered that impulsive individuals are more likely to have acquired capability as being exposed to pain more widely, which is one of the 3 key elements of our 'Truth of Suicide'.

❖ **Environmental Influences:**

Environmental influences on suicidal behaviour include literal environmental factors like sunlight exposure and situational factors like presence of abuse, history of suicide attempts and other items that are commonly known as suicide risk factors.

We have found a strong relationship between 'Exposure of sunlight & Suicidal behaviours'. Lack of sunlight is responsible for creating a dark, damp & messy environment, which results into a sensation of internal uneasiness and irritability. This results into a state of stress, as there is a need to more use of oxygen. Again, damp weather leads to the over-activation of pathological microorganisms, which leads to a sequelae of Allergy → Inflammation → Liberation of reactive oxygen species & reactive nitrogenous species → Oxidative stress → Activation of dopaminergic and adrenaline systems → Damage in the frontal lobe of brain Depression → Suicidal thoughts & behaviours.

Other risk factors for suicide include the American Association of Suicidology's IS PATH WARM mnemonic:

- Ideation (thoughts of suicide)
- Substance Abuse
- Purposelessness
- Anxiety
- Trapped (a feeling of being trapped)
- Hopelessness
- Withdrawal (from others)
- Anger
- Recklessness
- Mood Changes

❖ **Influence of Events on Suicide:**

- Emotional upset
- Mental shock
- Deprivation from the expectation level
- Expectation- Performance- Demand mismatch
- Mental shock
- Huge demise
- Fight
- Insults etc.

➢ **The Origins of Suicidal Brains:**

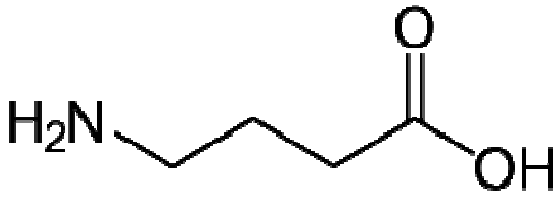
Suicidal brains are somehow different from non-suicidal brains. There are many differences encountered in the studies, which are sufficient to state that they have marked differences which may worsen more and more as their life advances. From these, it is sufficient to declare that, suicide is not only a behavioral problem, rather it is a gift from our ancestors & surroundings which collectively engraved several pathological changes within us.

One of the major causes of suicide is Depression; which is the gift of this modern time. Depression is the result different regular causations, some of which are as follows:

- Lack of principle of life
- Ill-defined goal
- Faulty understandings
- Unexpressed feelings
- Expectation- Performance- Demand mismatch
- Insults from varying degrees
- Interpersonal distances
- Compromization with own self
- Conflict
- Addiction
- Abuse
- Altered meaning of life
- Influence of Media
- Dependency on the social media
- Lack of quality timing e.t.c.

This depression is a result of these and many other so-called advance life strategies and policies. His monstrous condition may results into a number of serious physical pathological conditions, like Metabolic syndromes, Cardio-vascular disorders, Cerebro-vascular accidents, Endocrinal disorders, Carcinogenic conditions, Neurological disease & so on. 2/3rd of the victims who killed themselves, are encountered as depressed.

Depressed individuals who commit suicide in last 5 years, have an abnormal distribution of receptors for the chemical ***gamma*-Amino butyric acid (GABA),** one of the most abundant neurotransmitters in the brain. The role of GABA is to inhibit neuronal activity.

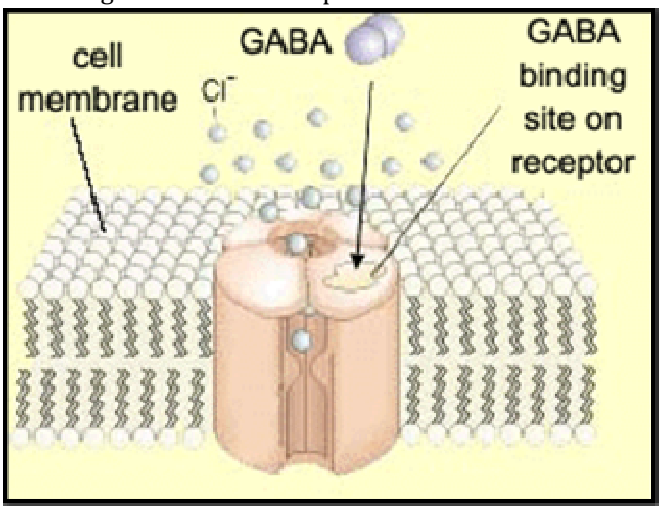


GABA receptors are probably the most common kind in the mammalian nervous system. It is estimated that close to 40% of the synapses in the human brain work with GABA and therefore have GABA receptors.

GABA receptors are channel receptors. This means that when GABA binds to them, they change shape slightly to allow ions to pass through their central channel. This channel mainly allows negatively charged chloride ions to enter the neuron, thus reducing its excitability.

Because of this property of the GABA channel receptor, GABA is classified as an inhibitory neurotransmitter, as

opposed to excitatory neurotransmitters, such as glutamate, which augment the nerve impulses in the neuron.



GABA is the natural "key" to the GABA channel receptor's "lock". But GABA is not the only molecule that can modify this channel receptor's opening. Other molecules can also affect it, such as the benzodiazepine medications used to treat anxiety. By binding to this receptor at different sites from GABA, the benzodiazepines help to reduce the transmission of the neural message.

Poulter & his colleagues found that one of the 1000 types of receptors for GABA is underrepresented in the fronto-polar cortex of people with depression & the people with suicidal ideation compared with non-depressed or non-suicidal people who died due to other causes. The fronto-polar cortex is involved in the higher-order thinking, such as decision-making.

Most importantly, GABA receptor problem is not the result of any abnormal or mutated genes; rather the change is epigenetic, which means some environmental and familial influences have affected how often the relevant genes were expressed- i.e. made into proteins. In the fronto-polar cortex of suicide brains, the gene for the GABA-A receptor often had a molecule called a methyl group attached to it, the team found. When a methyl group is attached to a gene, it keeps that gene hidden from cells' protein-building machinery—in this case, preventing the cells from manufacturing GABA-A receptors.

The addition of this methyl tag, called methylation, occurs more extensively in rodents that are handled by humans than in rodents that are not. Less is known about what causes methylation in the human brain, but another recent study suggests it could be related to abuse during childhood. the gene responsible for creating cells' protein-building machinery is more frequently methylated in the hippocampus—the brain region responsible for short-term memory and spatial navigation—of depressed suicide victims who suffered child abuse than in the brains of non suicide victims who were not abused.

Even in the womb, epigenetic influences can change the developing brain in ways that increase the risk of eventual suicide. The behaviours, thought patterns, surrounding environments, performances, practices during a pregnancy must affect the child grossly, in spite of our hyper-arrogant ignorant nature. A study have instituted where those babies with family history of chaos are found to be more suicidal and violent in comparison with the non-chaotic groups. A research paper of *Journal of Epidemiology and Community Health*, suggest that the chemical serotonin, which is involved in fetal brain growth, may play a role. A stressful or deprived womb environment may interfere with the development of the foetus and its serotonin system; other studies have shown that the brains of people who exhibit suicidal behaviors have reduced serotonin activity.

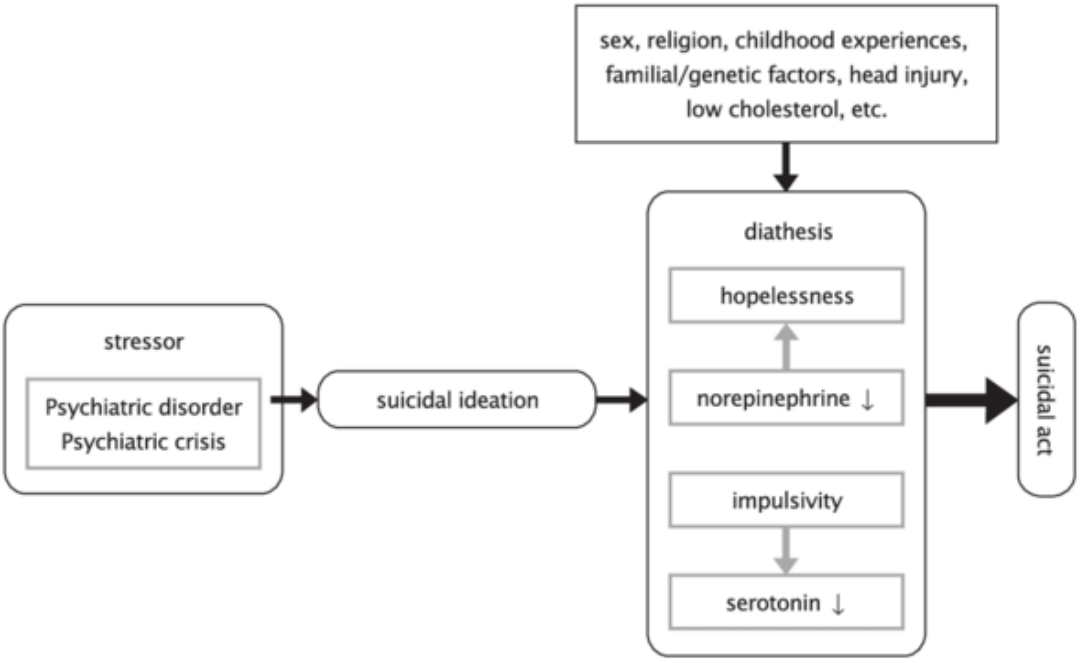
So, we can say that suicide is not only an attitude or behavioral problem, rather it is an biological imbalance resulting from a series of familial, environmental and psycho-social influences, which can be the responsible factors for these epigenetic changes. We are basically culprits who are making suicide victims for future, by our willful ignorance & arrogant nature. This epigenetic variation is nothing but a non-sense gift from our ancestors due to the 'all known' character of our society. The one day theory of several offences leads to a storage of all negative impulses within our memory box in an unconscious manner.

There are several changes encountered in the frontal lobe of the brain of suicide victims. Suicide is basically a deliberate try to seek attention from the surroundings, in order to get instant reward. The frontal lobe of the brain is rich in dopamine-sensitive neurons. Dopamine is a chemical that helps support feelings of reward & motivation. So, due to ever-increasing amount of stress, these neurons are very much prone to undergo through the oxidative stress, that is why this region becomes more affected, thereafter results into the formation of a depressive state. Damage in the frontal lobe is one of the chief predisposing factors for the development of suicidal ideation, depression and broken down condition; that is why one can able to encounter maximum of the frontal lobe damage findings in a suicidal subject.

- **Stress- Diathesis Model of Suicidal Behaviour:**

Early descriptions of the roles of stress and a diathesis in the development of suicidal behavior were grounded in sociobiology (De Catanzaro, 1980). Further studies focused on cognitive psychological characteristics. Rubinstein (1986) developed a stress–diathesis theory of suicide, in which the effects of specific situational stressors and the categories or predisposing factors of vulnerable individuals in a given culture were integrated in a bio-cultural model of suicidal behavior. Mann and Arango (1992) then proposed a stress–diathesis model based on the integration of neurobiology and psychopathology, which still forms the basis for much of the current research in suicidology. Particular emphasis was thereby given to changes in the serotonin system and how these may represent a constitutional risk factor as opposed to a state-dependent risk factor for suicidal behavior.

The following sections will focus on the stress component and the diathesis component of stress–diathesis models of suicidal behavior, followed by a description of a number of such models.



❖ **Stress Component:**

Psychosocial crises and psychiatric disorders may constitute the stress component of stress–diathesis models of suicidal behavior. It is difficult to separate the impact of psychosocial adversity from that of psychiatric illness. Poverty, unemployment, and social isolation have all been implicated in suicide. These factors are clearly not independent from each other or from psychiatric illness. Psychiatric disorders can lead to job loss, to breakup of marriages or relationships, or to the failure to form such relationships. Moreover, psychiatric illness and psychosocial adversity can combine to increase stress on the person, but above all deficient capacity to cope up must play a considerable role.

A substantial number of studies have focused on state-dependent cognitive characteristics of depressive episodes in association with an increased risk of suicide. More particularly, Beck's theory of modes has been shown to offer a framework for conceptualizing suicidal behavior, which is useful for treatment and prevention. Modes are defined as interconnected networks of cognitive, affective, motivational, physiological, and behavioral schemata that are activated simultaneously by relevant environmental events and result in goal-directed behavior. Thus, suicidal individuals may experience suicide-related cognitions, negative effect, and the motivation to engage in suicidal behavior in the context of a depressive episode and following exposure to triggering life events. Mental pain (or "psychache") thereby appears to be an emotional and motivational characteristic of particular importance.

It appears however that some of these state-dependent characteristics are to be regarded more appropriately as trait dependent and thus as a part of the diathesis. The emergence of cognitive suicidal modes and feelings of hopelessness during suicidal crises may indeed be regarded as activations of trait-dependent vulnerability characteristics.

❖ **Diathesis Component:**

Genetic effects, childhood abuse, and epigenetic mechanisms may be involved in the aetiology of the diathesis to suicidal behavior. Clinical studies have suggested that childhood abuse, deprivation and insults can play a considerable role in the future development of the suicidal ideation & gestures. Neuroanatomical, physiological, and genomic alterations may contribute to the long-lasting detrimental effects of exposure to childhood adversity on the risk of psychopathology. The involvement of serotonin and other neurotransmitters, the (epi)genetics of suicidal behavior, and the role of gene–environment interactions are to be discussed later. Postmortem and neuro-imaging studies have clearly demonstrated structural and functional changes in the brains of individuals with a history of suicidal behavior, which may correlate with components of the diathesis. Postmortem findings include fewer cortical serotonin neurons in key brain regions such as the dorsal and ventral prefrontal cortex, which also appear to correlate with components of the diathesis.

These components may include aggression and/or impulsivity, pessimism and hopelessness, and problem-solving or cognitive rigidity. Recent studies have used neuropsychological approaches to the study of the diathesis, and have focused particularly on decision-making processes.

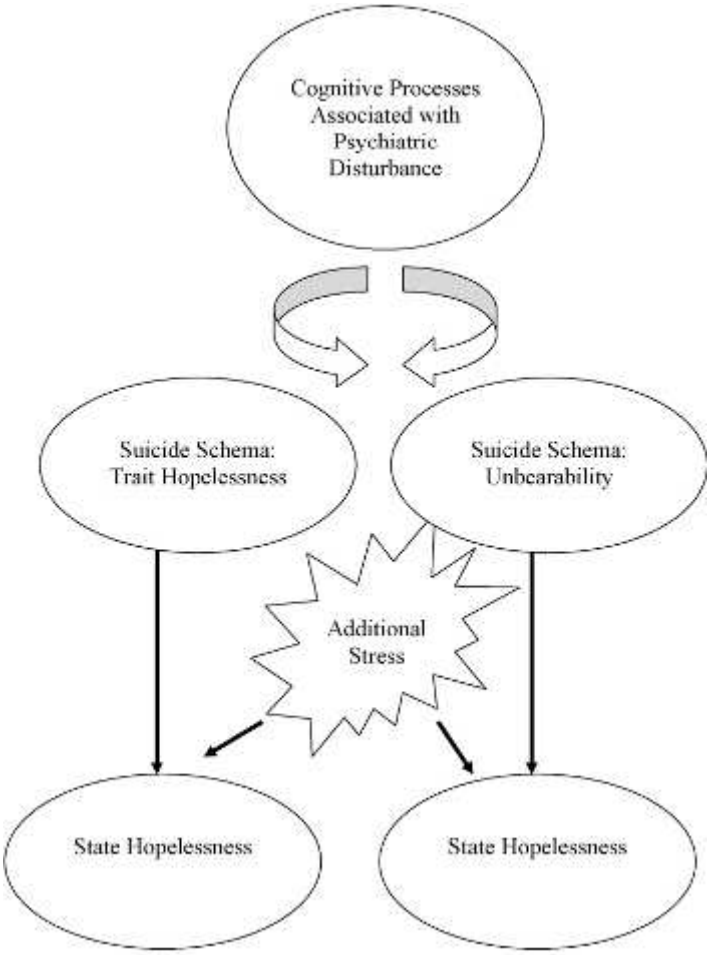
The concept of a continuous diathesis may explain differences in suicidal behavior between individuals, for example, why individuals differ in their suicidal reaction to similar life events varying from deliberate self-harm with no or minor physical consequences to completed suicide. Repeated exposure to stressors may thus gradually diminish the resilience toward stress, due to which stressors of decreasing severity may lead to suicidal behaviors with increasing suicidal intent. Increasing evidence points at a role of increasing neuropsychological deficits in the medial temporal cortex–hippocampal system, perhaps due to the detrimental effects of stress hormones on serotonergic neurons. As discussed in more detail elsewhere in this book, studies of levels of the serotonin metabolite 5-HIAA in the cerebrospinal fluid of suicide attempters have shown that (1) depressed

suicide attempters have lower levels than depressed non-attempters, (2) repeating attempters have lower levels than so-called first-evers, (3) the use of violent methods is associated with lower levels than the use of non-violent methods, and (4) attempted suicide patients with lower levels show a poorer survival in terms of death from suicide. Such findings point at a possible increase of the vulnerability to suicidal behavior during the suicidal process, which is paralleled by a decrease in serotonergic functioning.

- **Neuro-anatomy of Serotonergic Abnormalities in Suicide:**

Postmortem human brain studies have made significant contributions to unraveling the neuro-anatomical and biochemical profile of suicide. We and others have used the postmortem brain of suicides to understand the alterations present in the serotonergic system that underlie suicidal behaviors. In reviewing the current data from postmortem studies of suicides, it is clear that there are anatomically specific alterations in the serotonergic system that are specific to suicide and consistent with a homeostatic brain response both in source 5-HT synthesizing neurons in the raphe nuclei and in postsynaptic target neurons in the cortex, to deficits in serotonergic neurotransmission. While the data from postmortem studies are compelling and define the molecular profile of the brain in suicide, further studies are necessary to pinpoint whether these changes define causality for 5-HT deficits or are alternatively a normal brain response to a preexisting hypo serotonergic environment.

- **Cognitive Stress–Diathesis Model of Suicidal Behavior:**



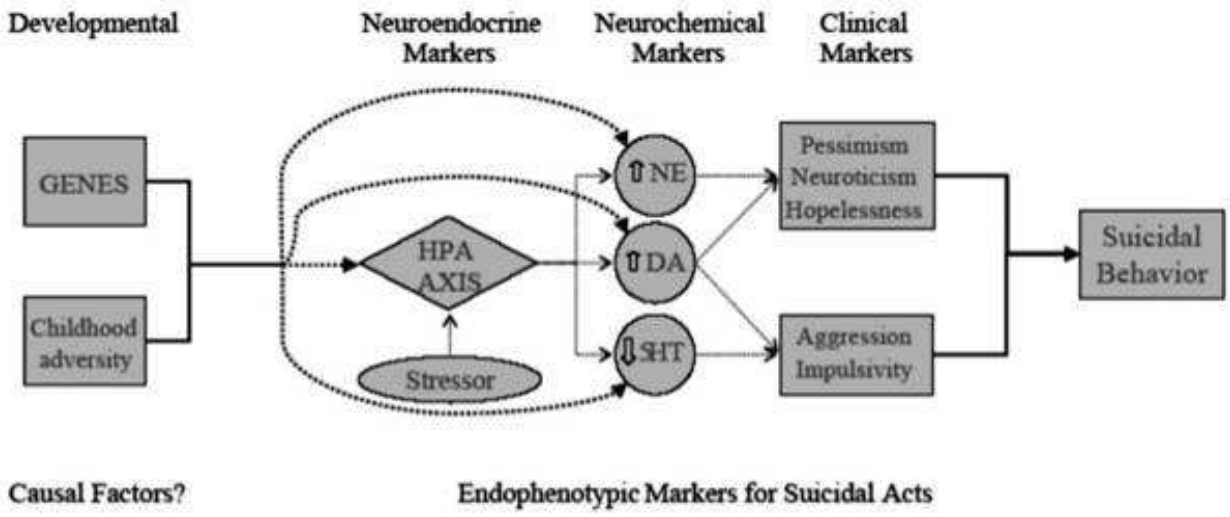
Williams and Pollock (2001) have described a diathesis for suicidal behavior in cognitive psychological terms, that is, the "cry of pain" model, which was elaborated in the "differential activation model." According to the "cry of pain" model, suicidal behavior represents the response to a situation that has three components:

1. **Sensitivity to signals of defeat:** Using the "emotional Stroop task," Williams and colleagues clearly demonstrated attentional biases (or so-called perceptual pop-outs) in association with suicidal behavior—an involuntary hypersensitivity to stimuli signaling "loser" status increases the risk that the defeat response will be triggered.
2. **Perceived "no escape":** Limited problem-solving abilities may indicate to persons that there is no escape from problems or life events. Further study has revealed that such limited abilities correlate with decreases in the specificity of autobiographical memories. To generate potential solutions to problems, a person apparently needs to have access to the past in some detail. Over general memories prevent the use of strategies, which are sufficiently detailed to solve problems.
3. **Perceived "no rescue**": The occurrence of suicidal behavior is associated with a limited fluency in coming up with positive events that might happen in the future. This limited fluency is reflected not only by the perception that there is no escape from an aversive situation but also by the judgment that no rescue is possible in the future. It is thereby interesting to note that the fluency of generating positive future events correlates negatively with levels of hopelessness, a core clinical predictor of suicidal behavior. This suggests that hopelessness does not consist of the anticipation of an excess of negative events, but indicates that hopelessness reflects the failure to generate sufficient rescue factors.

The identification of the neuropsychological correlates of the three cognitive components reflects an interesting characteristic of the "cry of pain" model, in addition to its clinical relevance. The authors state that, in this sense, the model fits in life events and biological research. The study of the biological underpinnings of hopelessness and mental pain, as discussed elsewhere in this chapter, indeed suggests that the components of this model can be studied using neurobiological research approaches and thus may contribute to our understanding of the pathophysiology by identifying possible endophenotypes of suicidal behavior.

➢ **An Integrated Model of Suicidal Behavior:**

The endophenotype approach is particularly relevant to the study of complex multi-determined behaviors such as suicide and suicide attempt. An endophenotype is an intermediary phenotype in the etiologic pathway from genes to disease[19], and represent more basic constructs, symptoms, or characteristics that are more amenable to quantification. Beyond focusing on the casual pathways between genes and suicidal behavior, the concept of an intermediary phenotype can also be useful as an approach to tracing the aetiological pathways from observed neurochemical, neuroendocrine, and neurophysiological dysfunction to suicidal outcomes via behavioral, clinical, and cognitive alterations. In the following diagram, we outline a putative model of suicidal behavior which originates with genetic and environmental factors and then delineates clinical, biological, and other risk factors identified in the literature, that may function as endo-phenotypes. Developing such explanatory models is a crucial step not only for identifying areas which require further investigation, but also for improving assessment of risk for suicidal behavior and identifying targets for preventive intervention. We will first outline some putative clinical, biological, and neurocognitive endophenotypes and describe the relationship between them, and then examine genetic and environmental considerations.



➢ **Clinical Endo-phenotypes**

Clinical traits repeatedly associated with suicide attempt and suicide death across psychiatric diagnostic groups include impulsivity, aggression, pessimism, and hopelessness. However, they are not sufficient to explain suicidal behavior, and these constructs or traits themselves are often complex or may be too loosely defined. For example, there are many types of impulsivity, which may potentially result from different underlying neurobiological anomalies. Moreover, clinical traits may be causally interrelated, e.g. both pessimism and aggression or impulsivity predict suicidal acts, but they also have an additive effect on suicide attempt risk. Addressing this complexity may require defining more precise constructs, and contextualizing traits in terms of related biological, genetic, and other domains of risk, so that a more fine-grained assessment of the relevance of such traits to suicidal behaviors is possible.

➢ **Neurochemical Endo-phenotypes**

Biological studies have examined the role of the serotonergic, noradrenergic, and dopaminergic systems in suicidal behavior, as well at the HPA axis stress response system.

❖ **Serotonergic system**

The most consistent finding in suicidal individuals is dysfunction in the serotonergic system. In suicide, altered serotonergic function has been evidenced in studies of the serotonin metabolite 5-hydroxyindo-leacetic acid in cerebrospinal fluid (CSF 5HIAA), and of serotonin receptors and transporters in postmortem brain. In a meta analysis of prospective studies, individuals with below median levels of CSF 5-HIAA were 4.5 times more likely to die by suicide than those in the above median group. Lower concentration of CSF 5-HIAA has also been reported particularly in individuals who use violent methods to suicide or make higher lethality non-fatal attempts. Postmortem studies of the brain in individuals who have died by suicide indicate a localized reduction in serotonin transporter (SERT) binding in the ventral prefrontal cortex, which could reflect reduced serotonin input in this area. SERT mRNA is found in the serotonergic neurons of the dorsal raphe nucleus and median raphe nucleus. Some hypothesize that findings in suicide victims of increased tryptophan hydroxylase, reduced SERT mRNA, and reduced number of 5-HT inhibitory auto receptors, are homeostatic mechanisms that arise secondary to serotonergic deficit.

In support of a role for altered serotonergic function in suicidal behavior *in vivo* imaging studies report lower C-a -methyl-L-tryptophan trapping in the orbital and ventro-medial prefrontal cortex in high-lethality suicide attempters, with a negative correlation with suicide intent, and a negative correlation of 5-HT binding with levels of hopelessness, a correlate of suicide and suicide attempt.

❖ **Noradrenergic function:**

Suicidal and depressed patients have a decreased number of norepinephrine (NE) neurons in the locus ceruleus. Secondary to lower norepinephrine levels, greater b-adrenergic cortical receptor binding (down regulation), and lower a-adrenergic binding (upregulation) have been reported. These changes are suggestive of cortical noradrenergic over activity that may be attributable to norepinephrine depletion from the smaller population of norepinephrine neurons found in suicide victims. Moreover, the exaggerated sympathetic responses to stress exhibited by individuals with a history of childhood trauma might further deplete norepinephrine function. In cross-sectional studies lower cerebrospinal fluid 3-methoxy-4-hydroxphenylglycol (CSF MHPG), a metabolite of noradrenalin, has been reported in suicide attempters compared to non-attempters in major depression and a sample of criminal offenders, however the majority of cross-sectional studies observe no differences.

In studies of the relationship of noradrenergic function and clinical endophenotypes for suicidal behavior, higher norepinephrine concentrations are shown to be associated with higher levels of aggression and increased CSF MHPG with greater hostility. Catecholamine depletion resulted in an increase in hopelessness in remitted depressed individuals treated with NRIs, consistent with preclinical studies suggesting NE intervenes in the development of pessimism and hopelessness.

❖ **Dopaminergic function:**

Altered function in the dopaminergic system has been found in depressive disorders and alcohol use disorder, however the role of the dopaminergic system in suicidal behavior is uncertain as the abnormalities observed in some studies may be attributable to depression. Reduced dopamine turnover, indicated by low dihydroxyphenylacetic acid levels, was found in the caudate nucleus, putamen, and nucleus accumbens reported in depressed suicides. In another study, the same group found no difference in number or affinity of the dopamine transporters, suggesting it is unlikely that the reduced dopamine turnover initially observed is a result of decreased dopaminergic innervations of those regions. Prospective studies disagree as to whether the dopamine metabolite homovanillic acid (HVA) levels in CSF predict suicidal behavior. In terms of clinical endophenotypes for suicidal behavior and dopaminergic function, higher CSF HVA levels correlate with increased aggression and striatal dopamine D2 receptor binding was correlated with neuroticism scores in a healthy community sample.

➢ **Neuroendocrine Endo-phenotypes:**

- **Hypothalamic-Pituitary-Adrenal Axis-**

Postmortem studies of suicides have reported fewer corticotrophin releasing hormone (CRH) receptor binding sites in the frontal cortex and increased CRH concentrations in CSF. Hyperactivity of the HPA axis has been associated with suicidal behavior evidenced by a failure to suppress cortisol secretion following the administration of Dexamethasone (DST).

- **HPA axis and neurotransmitters-**

The HPA axis has complex relationships with the serotonergic, noradrenergic, and dopaminergic systems, further complicating the biological picture. The HPA axis has a bidirectional relationship with the serotonergic system. CRH neurons of the central amygdala are connected to the raphe nuclei, the principal serotonin source to the forebrain. Projections from the raphe nuclei extend to various brain regions that contain CRH and participate in the stress response. HPA hyperactivity observed in suicidal patients may mediate or moderate some of the serotonin abnormalities found in these patients, and corticosteroid modulation of serotonin receptors as a response to stress may have important implications for the pathophysiology of suicide. The HPA axis also has a bidirectional relationship with the norepinephrine system. Stress activates not only the HPA axis but also the *locus ceruleus* (LC) the major source of norepinephrine neurons in the brain. This activation leads to increased norepinephrine release during stress. LC neurons influence the neuro-endocrine stress response system through their broad innervation of the paraventricular nucleus (PVN) projection pathways. Reciprocal interactions connecting cerebral NE and CRH systems may generate a "feed-forward" loop. Severe anxiety in response to stress may be associated with norepinephrine over activity and hyperactivity of the HPA axis, thus contributing to suicide risk. Dopamine modulates the HPA axis response to stress. The DA system is particularly vulnerable to stress and even low intensity stressors, either acute or chronic, can activate DA neurons. However, there is a paucity of data on these effects with respect to suicidal behavior. These interactions suggest multiple pathways through which stress may contribute to the biological anomalies observed in suicidal behavior, both directly through dysfunction of the HPA axis and the noradrenergic system and interactions between these two systems, as well as indirectly through downstream effects on serotonergic and possibly dopaminergic system function.

➢ **Neuropsychological Endo-phenotypes**

Deficits in a range of cognitive domains including executive function, attention, language fluency, memory, problem solving and decision-making skills, and impulsiveness have been observed in association with suicidal behavior. Attentional deficits are frequent in depressed individuals, but significantly more frequent in individuals who have attempted suicide. Although attention may be affected globally in suicide attempters, performance on interference-type tasks can provide more specific information. The Stroop Test and the Continuous Performance Test (CPT) are reliable predictors of attentional deficits. Although Stroop performance does not distinguish attempters and non-attemp-ters, greater effects are observed in the Stroop interference sub-score in depressed suicide attempters compared to depressed non-attempters. Moreover, among depressed attempters, Stroop performance distinguishes high- and low-lethality suicide attempters suggesting that problems with executive control may be associated with more medically serious attempts. Impairments on the Stroop interference task are indicative of difficulty shifting attention from "compelling but inappropriate" stimuli. In a suicidal individuals, such difficulty could predispose to attending to negative emotional states, such as pessimism and self-blame, and lead to action on such states. Impaired attention may also underlie the cognitive rigidity that is a common clinical feature in suicide attempters. In other attention studies, higher rates of CPT omission and commission errors were reported in adolescent suicide attempters compared to non-attempters, however such differences were not observed among adults.

- **Genes and early-life environment:**

Previous diagram indicates two factors at the outset of a putative causal chain leading to suicidal behavior: **genetics** and **early-life adversity**. In this section we will review findings that suggest that these two factors impact on both biological and consequently clinical intermediate phenotypes and indicate potential causal pathways leading to suicidal acts.

❖ **Early-life environment:**

Adverse events in early life, including sexual or physical abuse, neglect, parental loss, or severe family discord, have been associated with suicidal behavior. Sexual and physical abuse independently contribute to repeated suicide attempts after controlling for a range of other childhood adversities. One pathway through which early-life adversity contributes to suicidal behavior later in life is through developmental effects on neurobiological systems that have functional consequences in adulthood. Evidence from both animal, and human studies demonstrates lasting alterations in HPA axis, and serotonergic and dopaminergic systems, associated with early-life adversity. These alterations may in turn increase vulnerability for the development of psychiatric disorders, stress sensitivity, and behavioral and personality traits such as impulsivity and aggression later in life, all of which are associated with increased risk for suicidal acts.

- **Genes and Suicidal Behavior:**

Twin, adoption, and family studies of suicidal behavior demonstrate a role of genetics in suicidal behavior independent from the presence of axis I or axis II disorders. Population based estimates of the contribution off additive genetic factors are between 30-50% for a broad phenotype of suicidal behavior that includes ideation, plans and attempts, largely independent of the inheritance of psychiatric disorder. Twin studies report that the concordance rate for suicide in twins is higher in monozygotic (24.1%) compared with dizygotic twins (2.8%). Adoption studies reveal higher suicide rates in the biological parents of adoptees who died by suicide, compared to biological parents of adoptees who did not. Offspring of depressed suicide attempters are more likely to become suicide attempters themselves compared to offspring of depressed non-attempters.

Genetic research in suicidal behavior has included linkage studies, and single nucleotide polymorphism (SNP) association studies. Given the likelihood of a polygenic mode of inheritance, more recent studies adopt novel methodologies involving functional genomics such as using microarray technologies to profile expression of thousands of genes simultaneously, and genome wide arrays for hundreds of thousands of SNPs. Candidate genes for SNP association studies have been selected largely based on the evidence from neurobiological studies in suicide. To date the serotonergic system has been the most extensively investigated, but other research targets have been the dopaminergic and noradrenergic systems, brain derived neurotrophic factor, and the HPA axis.

❖ **Serotonergic system genes**

Specific polymorphisms of the 5-HT_{2A} receptor gene have been associated with suicide attempt in mood disorder patients, including the 102T-1438A and T102C polymorphisms. It is unknown if there is some synergistic effect of the two on suicidal behaviour, or if the latter may just be a marker of the former. However, not all studies show consistent results, and meta-analysis of 25 studies found no association between T102C polymorphism and suicide attempt or suicide.

There is a relatively common polymorphism of the serotonin transporter gene (5-HTTLPR) where the low expressing S allele has been linked to decreased serotonin function in vitro. Meta-analysis that included 12 studies comprising 1599 subjects found a significant association of the 5-HTTLPR low expressing S allele and suicidal behavior. However, studies of the 5-HTTLPR genotype and serotonergic function in suicide have been few. In studies examining 5-HTTLPR and serotonin transporter density in postmortem brains individuals who died by suicide one reported an association[111] and four did not. A recent SPECT study in a small sample of male suicide attempters found that the S allele was associated with lower transporter availability in suicide attempters but not in controls. Other imaging studies have examined brain function more generally, with respect to 5-HTTLPR genotype. In healthy adults, multiple studies report that individuals with the lower expressing SS genotype show increased amygdala activity when exposed to angry or fearful faces, negative words, or aversive pictures. The amygdala has a central in role in encoding of emotional memories, emotional regulation and responses to stress, and is densely innervated by serotonergic neurons and 5-HT receptors are abundant.

Tryptophan hydroxylase (TPH) is the rate-limiting enzyme in the synthesis of serotonin. Two variants have been described: TPH1 and TPH2. Some, but not all, studies reported TPH1 SNP associations with suicidal behavior, and aggression. For TPH2, haplotype studies in psychiatric samples report associations with suicide and suicide attempt, and single SNP studies report associations between TPH2 genotype and suicidal behavior in Chinese and German Caucasian psychiatric samples, but many others fail to observe any associations. Potential endophenotypes for the expression of the TPH2 gene are suggested in studies that find genotype association with decreased executive function and attention, altered amygdala response and, in an fMRI, study altered functioning in prefrontal and parietal brain regions associated with working memory.

Several studies have shown an association between alterations in the monoamine oxidase A (MAOA) gene and aggression, an element in the diathesis for suicidal behavior. Additionally, the MAOA-uVNTR polymorphism has been associated higher impulsivity in males. Because the gene for MAOA is sex linked, it is hypothesized that the higher rate of suicides among males could be due to greater impulsivity and aggression, secondary to specific MAOA polymorphisms. An fMRI study found that the low expressing alleles of the u-VNTR were associated with increased risk of violent behavior and with alterations in the corticolimbic circuitry involved in affect regulation, emotional memory and impulsivity. In two other fMRI studies MAOA genotype affected performance on response tasks indicative of impulsivity.

❖ **Other genes**

The catechol-O-methyl transferase (COMT) enzyme is a major enzyme in norepinephrine activation. COMT activity is affected by a single nucleotide polymorphism at codon 158 (COMT-Val/Met 158) where the allele encoding a valine

residue (Val allele) is associated with higher catalytic activity compared with the allele encoding a methionine re-sidue (Met allele). Recent meta-analysis of 519 cases and 933 controls from 6 studies found suggestive evidence of an association between COMT-Val/Met 158 polymorphism and suicidal behavior, perhaps related to the lethality of suicide attempt. Supporting this are reports of association bet-ween the low functioning Met allele and impulsive aggression in schizophrenia and violent suicide attempts.

The noradrenergic and dopaminergic systems, HPA axis, and neurotrophic factor BDNF have also been examined for candidate genes, with no consistent associations yet identified.

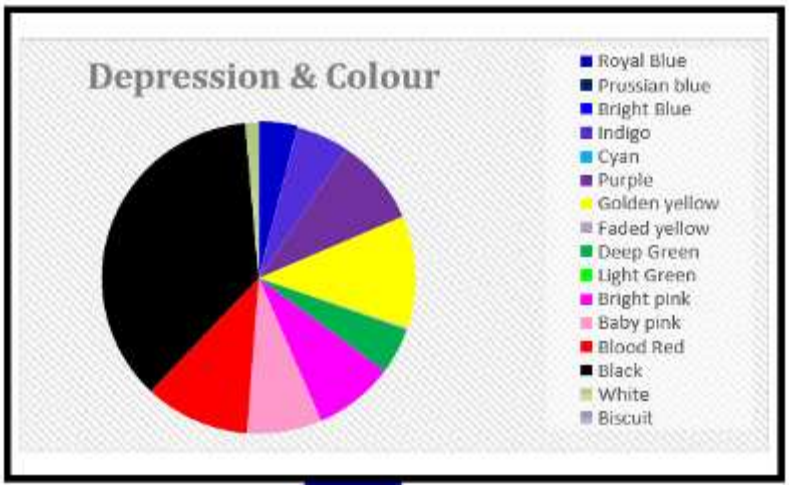
- **Genes and Early-Life environment**

The disparate findings in genetic association studies may in part be attributable to differences in environmental characteristics of study samples. Pre-clinical studies demonstrate that early-life adversity interacts with genotype and the resultant biological and behavioral alterations endure into adulthood. In humans, there have been multiple studies of early-life environment/ 5-HTTLPR interaction and vulnerability for psychiatric disorder, with most, but not all, reporting an effect. Other studies of the 5-HTTLPR report childhood adversity-genotype interactions and suicidal behavior in mixed diagnosis inpatients and among abstinent African American substance dependent patients. Adverse child-rearing, in combination with a lower expressing variant of the MAO A gene was also found to contribute, in males only, to the development of antisocial behavior and more impulsivity, both of which may contribute to suicidal behavior.

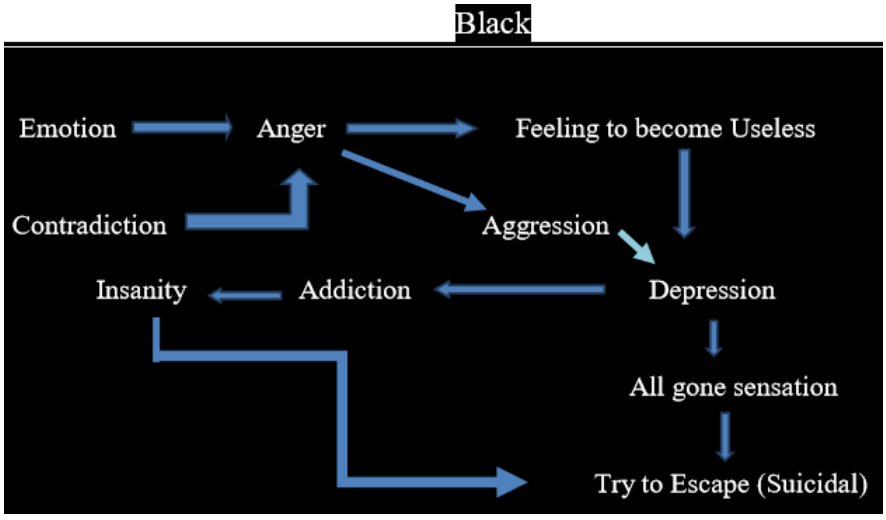
It is likely that such effects occur with genes related to the other neurobiological systems involved in suicidal behavior, for example, a recent study found an interaction effect between CRH Receptor 1 haplotype gene and early-life stress on the severity of depression. That study did not examine suicide related outcomes, however it is suggestive of another potential pathway whereby genes and environment contribute to vulnerability for suicidal behavior. More recently, preclinical studies have begun to investigate epigenetic mechanisms such as methylation as a pathway through which environment interacts with genetics to influence biological development and behavioral outcomes.

- **Roles of colors in depression**

Colour is the quality of an object or substance with respect to light reflected by the object, usually determined visually by measurement of hue, saturation, and brightness of the reflected light. Human eyes are sensitive to light which lies in a very small region of the electromagnetic spectrum, labelled "visible light". This visible light corresponds to a wavelength ranging from 400-700 nm and a colour range from violet to red. The colors effects the human materialstic as the cells is constituted with the inorganic materials and organic compounds. Some of these compounds are optically active as glucose ; optically active compounds are those compounds that changes its structures and function hence it affects the complete human body. Depression is also affected by the colours.



From the above chart, black colour affects more in depression and then comes the blood red. In the case of suicide black colour affects in a way of series of action as: -



- **Therapeutic intervention of treatment of suicide.**

The therapeutic intervention of treatment of suicide are as follows: -

- **Person centered counseling: -** In this context the question arises to each and every person is "who am I?". This is most toughest answer, as the answer must not be related to any person including parents, but what is the actual "I" of any one. When the patient himself gives the answer of this question he is clear of all his paths. This type of the self-thought counseling motivates the person by explaining his own thoughts to none other than himself.
- **Goal oriented counseling: -** Goal oriented counseling asks a question to the patient as "what is the purpose of living". The purpose is not the aim but what is your own purpose, as living a life for food, or to earn a name of own that has weight and is prosper to everyone. This type of purpose oriented questioning with the subjects interested in the public by which they are fond of is the main aim of this counseling.
- **Family therapy: -** Each and every person of a family has his own perceptive in living life. Hence, everyone is questioned as above questions in separate way and then every people of the family are brought together and the answers are discussed in a group discussion way. In this way each and everyone gets to know each other good and bad, thoughts and ideologies, subject of interest and purpose of living; when mixed together everyone leads a greater way of living life.
- **Group counseling: -** In this group counseling a group of peoples are kept together and relationship between everyone is discussed. This is done to enhance the quality of inter-person relationship.
- **Hypnotherapy: -** In this therapy, the patient is hypnotized and a contact between conscious and subconscious mind is developed. This connection clear various submerged thoughts and grief that are ending someone one by one. In this the patient himself explains his grief and later on is clear about all his sadness he is facing. There are several pains that are hiding inside the person that never comes out, at this hypnosis the pain is completely expressed by him and later he feels better.
- **Music therapy: -** Music is the essence of living. It clears soul and clears several obstruction of life. In Hindustani classical music ragas plays an important role in bringing the balance in human body. There are several ragas that works in the way of treatment as: -

- **Darbari Kannada: -** It is the creation of Miya Tansen. This a midnight raga that has proved effect on extreme level of stress, anxiety, insomnia, frustration, depression and coma. It gives a sleepiness during the raga being played with a pinch of excitement that later clears the deep irritating thoughts.
- **Pushpa: -** It is the raga that feels like as a river is flowing through all emotions with some waves clearing the emotions and depression in a harmonious way.
- **Bageshree: -** A raga full-of emotions and excitement. In this song the combination of ragas burst out in a silent and emotional way relating every depression and stress.
- **Madhubanti: -** An afternoon raga with a calm minded sweet sound with a variation of tantarang is a great way of treatment of depression.
- **Miya Ki Malhar: -** This is somewhat similar to Madhubanti Raga but this a raga of midnight/ evening depression.
- **Bhimkosh: -** An exciting raga that makes a person go in a happy mood clearing all the depression. This gives an out-burst of all the stress hiding in the subconscious state of mind.

- **Reference:**

[1] http://www.journalijar.com/article/29237/violence,-a-social- danger/?fbclid=IwAR31rwjl7wpLDONzx-jRD2ECjXhNSl5E6u0m7iAYW1TtpUcWPgT1pB4IGn8

[2] Bagge, C. L., Glenn, C. R., & Lee, H. (2013). Quantifying the impact of recent negative life events on suicide attempts. *Journal Of Abnormal Psychology*, *122*(2), 359-368. doi:10.1037/a0030371

[3] Conner, K. R., Houston, R. J., Swogger, M. T., Conwell, Y., You, S., He, H., & … Duberstein, P. R. (2012). Stressful life events and suicidal behavior in adults with alcohol use disorders: Role of event severity, timing, and type. *Drug & Alcohol Dependence*, *120*(1-3), 155-161. doi:10.1016/j.drugalcdep.2011.07.013

[4] Cooper, J., Appleby, L., & Amos, T. (2002). Life events preceding suicide by young people. *Social Psychiatry & Psychiatric Epidemiology*, *37*(6), 271.

[5] Evans, W. P., Owens, P., & Marsh, S. C. (2005). Environmental Factors, Locus of Control, and Adolescent Suicide Risk. *Child & Adolescent Social Work Journal*, *22*(3/4), 301-319. doi:10.1007/s10560-005-0013-x

[6] Glick, A. R. (2015). The role of serotonin in impulsive aggression, suicide, and homicide in adolescents and adults: a literature review. *International Journal Of Adolescent Medicine And Health*, (2), 143. doi:10.1515/ijamh-2015-5005

[7] Kasen, S., Cohen, P., & Chen, H. (2011). Developmental course of impulsivity and capability from age 10 to age 25 as related to trajectory of suicide attempt in a community cohort. *Suicide And Life-Threatening Behavior*, (2), 180.

[8] Kumar, U & Mandal, M.K. (2010). Suicidal Behavior: Assessment of People-at-Risk. New Delhi, India: SAGE Publications.

[9] Lam, R. W., Carter, D., Misri, S., Kuan, A. J., Yatham, L. N., & Zis, A. P. (1999). A controlled study of light therapy in women with late luteal phase dysphoric disorder. *Psychiatry Research*, *86*185-192. doi:10.1016/S0165-1781(99)00043-8

[10] Pandey, G. N. (2013). Biological basis of suicide and suicidal behavior. *Bipolar Disorders*, *15*(5), 524-541. doi:10.1111/bdi.12089

[11] Sharma, S., & Sharma, J. (2012). Regulation of Appetite: Role of Serotonin and Hypothalamus. *Iranian Journal Of Pharmacology & Therapeutics*, *11*(2), 73-79.

[12] van Heeringen C, Godfrin K, Bijttebier S. Understanding the suicidal brain: A review of neuropsychological studies of suicidal ideation and behaviour. O'Connor R.C, Platt S, Gordon J, editors. Chichester U.K.: Wiley; The International Handbook of Suicide Prevention: Research, Policy and Practice. 2011b

[13] Williams J.M.G, Pollock L. Psychological aspects of the suicidal process. vanHeeringen K, editor. West Sussex, England: Wiley; In:Understanding Suicidal Behaviour: The Suicidal Process Approach to Research, Treatment and Prevention. 2001

[14] Zuckerman M. Vulnerability to Psychopathology: A Biosocial Model. Washington, DC: American Psychological Association.; 1999.