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# Anxiety Disorders and Suicide: Psychiatric Interventions

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Additional information is available at the end of the chapter

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## Abstract

A universal phenomenon equally ancient as the history of mankind, suicide is defined as the willful and intentional ending of one's own life. Risk factors for suicidal behavior are traumatic childhood and adulthood experiences, negative interfamily interactions, social isolation, decreased social solidarity, financial troubles, losses, despair, impulsivity, and migration. Recognized as a critical public health problem, preliminary causes of suicide are financial, religious, political, social, cultural, and medical in addition to mental disorders like depression and alcohol addiction. It has been proven in a number of researches till today that there is a correlation between major depression, bipolar disorder, schizophrenia, borderline personality disorder, alcohol-drug use, and suicidal behavior. Nonetheless, the relation between anxiety disorders and suicidal behavior has not been clearly defined to date. The evidences gathered so far reveal that panic disorder is only an independent risk factor for suicide attempt. The limited number of studies on this domain provided nonhomogenous results. It is however a point to keep in mind that if anxiety disorders are codiagnosed with mental disorders, they pose risk for suicidal behavior. In different studies with a wider sampling in this domain, analyzing the effect of specific anxiety disorders on suicidal behavior might be useful for suicide prevention programs.

**Keywords:** Anxiety disorders, suicidal thoughts, suicide attempts, comorbid psychiatric disorders, suicidal behavior

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## 1. Introduction

Nowadays, suicide is a major public health issue worldwide. Suicide is undoubtedly the most tragic event in human life. Globally speaking, around one million people commit suicide each year. Suicide is possibly witnessed among a wide range of population extending from normal individuals reacting differently to stress-triggering life conditions to people diagnosed with a mental disorder. Mental disorders as suicide causes have been studied in numerous researches

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and the correlation between depression and suicide has been particularly emphasized because major depression disorder comes first among the mental disorders that are related to both completed suicide and also suicidal ideation and attempt. The relation between anxiety disorders and suicidal behavior has been examined in limited numbers of studies with differing results. Some studies posited that there might be a relation between anxiety disorder and suicidal behavior, while in other studies it was posited that anxiety disorders on their own cannot be effective in triggering suicidal behavior. Anxiety disorders often cooccur with depression, and this may be masking a risk of suicidal behavior specifically related to anxiety. This higher likelihood was seen despite controlling for current depression, highlighting the importance of clinicians considering suicidal risk when working with anxiety patients who do not necessarily also have a diagnosis of depression. Although anxiety has been proposed to be a potentially modifiable risk factor for suicide, research examining the relationship between anxiety and suicidal behaviors has demonstrated mixed results. Until recently, anxiety disorders were not regarded as an independent risk factor for suicidal behavior which in turn limited the number of studies focusing on the significant relation between anxiety disorder and suicidal behavior. In a different saying, suicidal ideation in anxiety-diagnosed patients went unnoticed. Strong evidences have been gathered proving that panic disorder is an independent risk factor for suicide. There are uncertain findings about the possibility that specific anxiety disorders such as generalized anxiety disorder, obsessive-compulsive disorder, and posttrauma stress disorder may be independent risk factors for suicide. There are, however, stronger evidences that when anxiety disorder is codiagnosed with comorbid depression, bipolar disorder, schizophrenia, drug use, and personality disorders the risk may be substantially higher. In other words, controversy exists whether anxiety disorders are independently associated (i.e., after adjusting for comorbid mental disorders) with suicidal ideation and suicide attempts. Despite the existence of literature studies providing nonhomogenous findings, it is of great importance that clinicians focus more eagerly and attentively on suicide behavior in patients with anxiety disorder – particularly in patients codiagnosed with mental-disorder – to provide assistance to suicide prevention attempts. In this chapter, the relation between suicidal behavior and the anxiety disorder will be discussed.

## 2. Anxiety disorders

Anxiety disorders belong to the most frequent mental disorders and are often characterized by an early onset and a progressive, persistent/chronic, or recurrent course. Several individual, familial, and environmental risk factors for adverse course characteristics of anxiety disorders (including higher persistence, lower probability of remission, and increased risk of recurrence) have been identified, and previous research suggests that clinical features of anxiety (e.g., higher severity, duration, and avoidance) as well as comorbid other mental disorders are particularly useful for predicting an unfavorable course of anxiety disorders [1]. The literature reviewed here is consistent in showing that anxiety disorders are common psychiatric disorders that typically has an early age of onset, a chronic course, and a high degree of comorbidity with mood disorders and other psychiatric disorders [2]. Anxiety disorders are

one of the most prevalent of all psychiatric disorders in the general population [3-5]. Phobias are the most common with the highest rates for simple phobia (SP) and agoraphobia. For example, SP is the most common anxiety disorder, with up to 49% of people reporting an unreasonably strong fear. Among general population, prevalence of social anxiety disorder (SAD) meeting DSM-IV diagnosis criteria is circa 13%. Among general population, prevalence of posttraumatic stress disorder (PTSD) is 7.8%; however among particular groups (war veterans with 20%, domestic violence victim women 12%), higher prevalence of PTSD has been reported [6]. Panic disorder (PD) and obsessive-compulsive disorder (OCD) are less frequent, and there are discordant results for SAD and generalized anxiety disorder [7]. The epidemiological studies have shown that anxiety disorders are highly prevalent and important causes of functional impairment [2, 8]. However, due to their methodic differences, epidemiologic studies fail to adequately explain the effects of anxiety disorders on functionality since the high frequency of confusing sociodemographic variables (gender, age, race, ethnic structure, education, and marital status) can play different roles in the symptom severity and course of anxiety disorders [7]. Agoraphobia, SP, and generalized anxiety disorder (GAD) are more common in female, while there is no gender difference for SAD, PD, and OCD [6]. Anxiety disorders are more common among separated, divorced, or widowed people between ages 25 and 44. Anxiety disorders are rare among age 65 and above. Start age for anxiety disorders however varies for specific anxiety disorders. For instance, phobic disorders start at early age, while panic disorder is witnessed during early adulthood stage. Rather than epidemiological studies, stressful life events, childhood experiences, and familial factors as risk factors have been examined in clinical researches. Anxiety disorders are usually chronic and persistent and are generally accompanied with other psychiatric disorders such as other anxiety disorders, depressive disorders, personality disorders, and drug use. These codiagnosed conditions may negatively affect functionality and life quality. Further study is needed to better understand the comorbidity between anxiety disorders, the consistently higher rates of anxiety disorders, and the differential effects of socioeconomic and cultural factors on anxiety disorders.

### 3. Suicidal behaviors

The currently accepted nomenclature of suicide-related behaviors identifies suicide, nonfatal suicide attempts, and suicidal ideation [9]. Suicidal ideation is verbally expressing one's ideas about killing himself/herself. Suicide attempt is performing behaviors with the intention of killing oneself not ending with death but potentially causing major injuries. Completed suicide is dying as a result of the behavior performed to kill oneself. It is a requirement to make such classification for suicidal behaviors since for three different groups risk factors and clinical presentations vary. Hence this classification is needed in the prevention of suicides likewise. Global estimates suggest that each year there are 10–20 million suicide attempts and one million completed suicides [10]. Suicide attempts are costly in terms of occupational and interpersonal disruption [11]. Moreover, substantial financial costs are associated with the intensive psychiatric resources devoted to these patients [12]. Suicide is a multivariate phenomenon occurring with the combined effect of a multitude of factors such as psycholog-

ical, sociological, economical, and cultural. That explains the reason why suicide can be witnessed among a vast sampling group ranging from normal individuals to patients with severe mental disorders. Mood disorders and personality disorders (borderline personality disorder in particular) are psychiatric problems most frequently associated with suicide. Besides, there have been striking findings recently that point to the increasing effect of anxiety disorders on suicide. On that account this relation should definitely be analyzed in the prevention of suicide, which is a crucial public health problem. In cases with anxiety disorder, analyzing suicidal ideation and suicide attempt may prevent completed suicides hence lower the ratios of completed suicide; because suicidal ideation and preattempted suicide are the biggest risk factors for a completed suicide [10, 13, 14]. Studying such thoughts and behaviors, therefore, may increase our understanding of who is likely to attempt or complete suicide, potentially informing suicide risk management and prevention efforts. Psychiatric disorders are one the primary risk factors for suicidality, with up to 95% of suicides committed by individuals with one or more disorders.

#### **4. Anxiety disorders and suicidal behaviors**

Patients with anxiety disorders are at high risk for suicidal ideation, regardless of whether the suicidal ideation is due to anxiety disorders itself or to cooccurring conditions. In evaluating the literature, it is necessary to review general requirements for establishing anxiety as a risk factor for suicidal behaviors [9]. In addition to establishing a meaningful and consistent interrelation of anxiety with suicidal behavior, the other requirement is the absence of a third variance (mixing factor) between suicidal behaviors and anxiety. Besides, anxiety must have existed before suicidal behavior and in suicidal behaviors anxiety must act as the independent risk factor. Psychiatric disorders are one of the primary risk factors for suicidality, with up to 95% of suicides committed by individuals with one or more disorder [15]. In particular, the mood and anxiety disorders are associated with suicide ideation and attempts [16-19]. The relationship between anxiety disorders and suicide-related behaviors has received a modest amount of attention. However, research has also accumulated over the past several years indicating that anxiety disorders confer unique risk of suicide [20, 21]. The presence of current or lifetime anxiety disorders, including panic disorder, social phobia, generalized anxiety disorder, and posttraumatic stress disorder, are associated with increased suicide risk [10, 18, 22, 23]. Individuals with anxiety disorders demonstrate increased suicidal ideation and rates of self injury and more frequent suicide attempts than those without mental health disorders [10, 16, 17]. For this reason, it is of vital importance to comprehend and manage the risk factors for suicide among individuals with anxiety disorders. Despite the prevalence of high risk for suicide within cases with anxiety disorder, the determinants of suicide risk in this group have not yet been clearly established. In other words, anxiety disorders are very common and increase risk for suicide attempts. Little is known about predictors of increased risk specifically among individuals with anxiety disorders [19]. Studies of individuals with specific anxiety disorders including panic disorder, social phobia, and posttraumatic stress disorder indicate that the additional presence of depression and substance use disorders increases suicide risk



[10, 24]. Severity and aspects of functional impairment are also related to suicide risk in patients with anxiety disorders. For example, anxiety symptom severity is associated with increased suicidal ideation and attempts in patients with PD and patients with PTSD [10, 25, 26]. Associations between suicide risk and impairment in general functioning in PTSD and social functioning in both PTSD and PD are also documented [27, 28]. Twelve-month prevalence rates of suicidal ideation in patients with obsessive-compulsive disorder (OCD, 27.3%), the prevalence rate of suicide attempts in panic disorder (3.6%) and the prevalence rate of suicide attempts in OCD (3.3%) were the highest [21]. The overall 12-month and lifetime prevalence of GAD was 0.8% and 1.2%, respectively. Being older than 25 years and female, lower education level, unemployed status, and lower monthly income were associated with increased risk of GAD in China [29]. It remains unclear whether certain anxiety disorders are risk factors for suicide. For instance, Uebelacker et al. [19] have reported that PTSD, major depressive disorder (MDD), intermittent depressive disorder, epilepsy, pain and low social functionality are, according to univariate analysis, predictors of suicide attempt. In the same study, the findings of multivariate analysis showed that, even when the suicide attempts of the past are controlled, MDD and intermittent depressive disorder are independent risk factors in current attempts for suicide. However, it was concluded in this research that except panic disorder, no other specific anxiety disorder constituted an independent risk factor for suicide attempt. Mood disorders and past history of suicide attempts are the most powerful predictors of a future suicide attempt. Particularly, the patients with comorbid major depressive disorder anxiety are at higher risk for suicide. Thereby primary care health service doctors, emergency and mental health professionals, and clinicians who frequently come across with anxiety disordered cases should be alerted and attentive against potential suicidal ideation and suicide attempts among these patients.

#### **4.1. Anxiety disorders and completed suicide: Associated factors**

The presence of anxiety disorder is frequently associated with suicide ideation and behaviors. Considering the high costs of suicidal behaviors for the individuals and also the society, it is a foremost priority to prevent suicide. Grasping the factors related to increased risk for suicide among people with anxiety disorders may be contributive to suicide prevention attempts [10]. Anxiety disorders are independent risk factors for suicide attempts and underscore the importance of anxiety disorders as a serious public health problem [17]. The relationship between anxiety disorders and completed suicide is not known exactly. There are a limited number of studies on this subject [30, 31]. It is unclear whether clinical and behavioral suicide risk factors, identified primarily among men, can be extended to women. Personality variants and gender differences among suicide completers with psychopathological autopsy method were investigated. Among women, the ratio of completed suicides is lower than men. Impulsivity and alcohol use are risk factors for completed suicides. It is less common among women to see lifelong alcohol consumption, and among women with alcohol addiction, there is less prevalence of comorbid depression when compared to men. There exists a correlation between alcohol consumption and impulsivity. The low ratio of impulsivity among women triggers alcohol consumption as well. Furthermore, when the relation between impulsivity and applied suicide method is examined, it surfaces that among cases with high ratio of impulsivity, the

tendency to apply violence methods is more common. It is argued that women prefer non-violent suicide methods less pain causing but regardless of their sex, cases with anxiety disorder apply to nonviolent methods more frequently. On the other hand, when high ratio of impulsivity is combined with alcohol consumption, there may occur an elevated risk of suicide for both sexes [30].

#### **4.2. Anxiety disorders and attempted suicide: Associated factors**

The relationship between anxiety disorders and racial and ethnic differences has been studied in several research. For instance, Vanderwerker et al. [32] examined in their study covering 131 adults from different ethnic and racial origins (more than half of the cases with African American roots) the differences of risk factors for suicidal ideation and suicide attempts. They have detected that among young white adults, anxiety disorder (not depression) has an independent relation with suicide tendency, while there is no such relationship for African-Americans among whom there is a significant relation between suicidal behavior and social support could be identified. These findings clearly prove that suicide risk factors vary among races and ethnicities [32]. The results suggest that race/ethnicity-specific risk profiles may improve the detection of suicidality in vulnerable populations. But, Beautrais et al. [33] were found no ethnic differences in suicidal ideation. Risks of suicidal ideation, plan, and attempt were associated with mood disorder, substance use disorder, and anxiety disorder. Major depression was the specific disorder most strongly associated with suicidal ideation, plan, and attempt [33]. In a different study based on society sampling, a number of variables (demographic, work status, mental and physical health condition, personality features, stressful life experiences, and social environment) impacting the suicide-attempt speed in cases with suicidal ideation have been examined. Among age groups between 20–24 and 40–44 having committed suicide attempt, it has been seen that there was a higher ratio of suicidal ideation with respect to age-matched groups and higher levels of anxiety and depression. Upon checking the remaining variables, it has been reported that in cases between ages 20–24, rather than suicidal ideation but anxiety itself constituted a risk factor for suicide attempt. Particularly among men between ages 40–44, physical diseases and unemployment, rather than anxiety and depression, posed greater risks for suicide attempt. In a different saying, Fairweather et al. [34] found that ideators and attempters experience comparable levels of depression and anxiety. Rates of self-harm and associations between self-harm and suicidal behaviors, anxiety, hostility, and paranoid ideas were reported by Fliege et al. [35]. Although there has been significant interest in whether anxiety disorders are risk factors for suicidal behavior, this remains a controversial area. Cross-sectional community and clinical studies have repeatedly demonstrated in univariate models that anxiety disorders are associated with suicidal ideation, attempted suicide, and completed suicides. In multivariate models, it has been questioned whether panic disorder is associated with suicidal behavior after adjusting for other anxiety and psychiatric disorders. Because anxiety disorders are highly comorbid with other anxiety disorders and tend to cluster together, it is important to address whether anxiety disorders as a group of psychiatric disorders have an impact on suicidal behavior after adjusting for other types of other psychiatric disorders (especially mood and substance use disorders) [16].

## 5. Specific anxiety disorders and suicidal behaviors

The relationship between anxiety disorders and suicidal behaviors has not received sufficient amount of interest till present age. Literature review shows that when there is a definite result for a single anxiety disorder, anxiety disorders in general have high frequency relation with suicidal ideation; however its relationship with suicide attempt is not definite [9, 18, 36]. General tendency indicates that for each anxiety disorder there is a similar risk for suicide primarily obsessive-compulsive disorder, generalized anxiety disorder, and social anxiety disorder are associated with suicide ideation. The only specific anxiety disorder related most with suicide attempt is panic disorder [37]. In addition, a clear relationship was reported between PTSD and suicidal thoughts and behaviors, irrespective of the type of trauma experienced. It has been suggested that PTSD has a strong association with suicidality, predicting subsequent suicidal attempts [28, 38].

### 5.1. Panic disorder and suicide

Suicidal behaviors are multifactorial behaviors. While, historically, anxiety has been regarded as an important risk factor in suicidal behaviors, epidemiological studies carried out on general population or panic patients have evidenced the possible links between suicidal behaviors and the occurrence of panic attacks [39, 40]. Both panic attacks and panic disorders are, in the society and primary health care service, independently related with the increased suicide attempt risk. In epidemiologic samplings, panic disorder is, like major depressive disorder, a risk factor for lifelong suicide ideation and suicide attempt [40-42]. For example, an association between panic and suicidal ideation has been reported by Goodwin and Roy-Byrne [43]. Epidemiologic catchment area (ECA) studies indicate that, when contrasted with other psychiatric disorders, panic disorder is associated with increased suicide ideation and suicide attempt risk [40]. Additionally, epidemiologic data show that when panic disorder is codiagnosed with major depression, alcohol addiction, personality disorders, and cocaine use, there is higher risk for suicide attempt [44, 45]. For instance, Goodwin and Roy-Byrne report that despite the vital role comorbid depression and drug abuse play, attempts for the last one year (not lifelong) are independently related to panic disorder [43]. It has been suggested that panic disorder may not increase past suicide attempt systematically but may climb the suicide attempt in the future. In a vast majority of the monitoring studies of patients with anxiety disorder, there was 20% ratio of suicide caused deaths like the results in major depressive disorder. Similarly, the ratios in suicide attempts have been similar to major depressive disorder and panic disorder [40, 46]. Existing findings are quite remarkable. Patients who suffered from major depressive disorder with related panic disorder were given to more impulsive suicide attempts, even if the difference with depressed patients without panic disorder was statistically insignificant [39]. Primary care patients with PD are at high risk for suicidal ideation, and patients with PD and cooccurring MDD are at especially high risk. Patients with PD in primary care thus should be assessed routinely for suicidal ideation and depression [42]. Although in society-based studies it is indicated that there is a strong relation between PD and suicide ideation, in many other studies with clinic sampling (receiving psychiatric treatment and hospitalized in psychiatry clinic or hospital), no statistically significant relation between PD and suicidal



ideation could be detected [24, 47]. For example, Warshaw et al. [24] reported that there was no association between PD and suicidal ideation after controlling for common comorbid psychiatric disorders. In another study, it was revealed that suicidal behavior risk in panic disorder is not higher than the risk in major depressive disorder [42]. Dammen et al. [47] could not find any difference in terms of suicidal ideation between patients with or without panic disorder. Several mental disorders, such as personality disorders, and life events that have been associated with suicidality, e.g., early childhood abuse, were not assessed and may account partially for the observed association between PD and suicidal ideation [48, 49]. In some clinical studies, patients with PD and borderline personality disorder were at significantly higher risk of suicidal behavior than were PD patients with panic disorder alone [24]. To sum up, there is still an ongoing discussion about the relation between panic disorder and suicide behavior. It is not yet identified if panic disorder singly or when comorbid with other mental disorders like major depressive disorder is effective in suicidal behavior [24, 40, 50]. Thus, the data indicate that the risk of suicide in panic disorder is substantial. As a consequence, clinicians should alert themselves to this preventable outcome and approach treatment with added caution.

## 5.2. Posttraumatic stress disorder and suicide

Posttraumatic stress disorder (PTSD) is frequently associated with suicidal ideation and suicide attempts. Suicide is an important cause of death in veterans, and the risk for intentional death continues to be high many years after service [51]. Suicidal behavior is a critical problem in war veterans. Combat veterans are not only more likely to have suicidal ideation, often associated with PTSD and depression, but they are more likely to act on a suicidal plan [52]. Citizen soldiers (National Guard and Reserves) represent approximately 40% of the two million armed forces deployed to Afghanistan and Iraq. Twenty-five to forty percent of them develop PTSD, clinical depression, sleep disturbances, or suicidal thoughts [53]. Veterans reporting subthreshold PTSD were three times more likely to endorse these markers of elevated suicide risk relative to the veterans without PTSD [54]. They found no significant differences in likelihood of endorsing hopelessness or suicidal ideation comparing subthreshold and threshold PTSD groups, although the subthreshold PTSD group was less likely to report prior mental health treatment [54]. Major depressive disorder cooccurs frequently with PTSD, and both disorders are linked to suicidal ideation. For the war veterans with depression symptoms, there is a strong relation between PTSD symptoms and suicidal ideation. According to these findings, when analyzing PTSD-diagnosed war veterans, depression symptoms of suicidal ideation must be taken into account [55]. Of those veterans diagnosed with PTSD, many have comorbid psychiatric disorders, typically major depressive disorder, substance use disorders, and other anxiety disorders [56]. Veterans with PTSD are also more likely to have social, occupational, and functional difficulties, including social isolation, frequent interpersonal altercations, and suicidal ideation [28]. PTSD and MDD occur together frequently, and both disorders have been separately linked to the increased risk of suicidal ideation [57, 58]. It is unclear, however, whether the combination of comorbid MDD and PTSD confers an increased risk for suicidal ideation beyond the risk presented by either diagnosis alone. Several studies of veteran samples have found that the combination of PTSD and MDD did not place

individuals at greater risk for suicidal ideation than did a single diagnosis [54, 55, 59]. Conversely, Oquendo et al. [60] found that individuals with current MDD and comorbid PTSD were more likely to endorse suicidal ideation compared to those without a current PTSD diagnosis. In a different study, it was determined that among veterans with schizophrenia and schizoaffective disorder, there is an independent relation between comorbid PTSD suicidal ideation risk but no such risk could be detected for suicide attempt [61]. Suicide has huge effect on public health but despite efficient interventions, a great number of people with suicide risk cannot benefit from these interventions and lose their lives. Until now, a huge number of programs and strategies named as “suicide prevention” have been developed. Recent interventions about exercise give hope in the prevention of suicide thanks to its ease of application because exercise mitigates depression symptoms. Alleviating depression symptoms may provide lessened suicidal ideation and attempt but no study has so far indicated a direct relation between exercise and suicidal behavior. Davidson et al. [62] analyzed in veteran sampling a number of variables (sleep disorders, PTSD, and depression) that might be associated with suicidal risk. In this study, it has been emphasized that there may exist an indirect relation between exercise and suicide. It has also been suggested that exercise is also connected with low depression symptoms and a better sleep pattern, which might in effect lead to lower suicidal risk. A high prevalence of all types of violence is associated with the highest prevalence of depression and PTSD [63]. It is well established that intimate male partner violence (IPV) has a high impact on women’s mental health. Compared to women in control group, among women subjected to physical and psychological IPV, there is higher ratio of depression and anxiety disorders, PTSD, and suicidal ideation. Among women exposed to sexual abuse and sexual violence, there is high ratio of depression symptoms, physical/psychological abuse, and suicide attempt. In reality, PTSD on its own is quite hard to see. Depression symptoms are present either singly or codiagnosed with PTSD. Anxiety ratios are higher among women with comorbidity or abused women with depression symptoms. This may explain the high ratio of suicide attempts and anxiety among physically/psychologically abused women [64, 65]. Recovery from depressive symptoms, state anxiety, and posttraumatic stress disorder in women exposed to physical and psychological but not to psychological intimate partner violence alone. A metaanalysis with 50-article examining the relation among PTSD and past and present suicidal ideation and behavior has been conducted. There is no evidence showing that among PTSD patients there is a risk for completed suicide risk. A relation has been found among presuicide attempt and past and present suicidal ideation. Upon checking other psychiatric disorders (including depression), the relation between PTSD and suicide attempt has been examined but no sufficient data could be detected, but it was also reported that comorbidity depression and pretraumatic psychiatric state may have been a mediator. It is seen that a relation exists among various factors and PTSD and suicidal tendency [66]. In a different study, it was seen that among women patients with comorbid PTSD and drug addiction, suicide behavior varies according to drug addiction type and presence of preventive factors (for instance, worries about kids, will to live, and coping skill) [67]. Clinicians should be attentive to suicide risk in returned veterans and in women exposed to physical/psychological and psychological IPV. For future studies, assessing suicide risk in PTSD and identifying risk factors shall assist in better understanding the topic and preventing suicidal behavior.

### 5.3. Obsessive-compulsive disorder and suicide

Suicidal thoughts and behaviors, also known as suicidality, are a fairly neglected area of study in patients with obsessive-compulsive disorder. Patients with obsessive-compulsive disorder (OCD) have historically been considered at low risk for suicide, but recent studies are controversial. Torres et al. [68] found thirty-six percent of the patients reported lifetime suicidal thoughts, 20% had made suicidal plans, 11% had already attempted suicide, and 10% presented current suicidal thoughts. The sexual/religious dimension and comorbid substance use disorders remained associated with suicidal thoughts and plans, while impulse-control disorders were associated with current suicidal thoughts and with suicide plans and attempts [68]. The risk of suicidal behaviors must be carefully investigated in OCD patients, particularly those with symptoms of the sexual/religious dimension and comorbid major depressive disorder, PTSD, substance use disorders, and impulse-control disorders [69]. Lester and Abdel-Khalek [70] reported that there is no relation between OCD and suicidal ideation but a relation between OCD and suicide attempt. However, there are certain limits such as the smallness of sampling group and failure to control depression. In a different study conducted with same research group in 2002, it was reported that there is a significant relation between OCD and suicidal ideation but again depression was not controlled in another study [71]. Obsessive-compulsive personality disorder is a factor increasing risk for nonfatal suicidal behavior independently of risk conferred by depressive disorders. For example, Diaconu and Turecki [72] reported that the comorbid obsessive-compulsive personality disorder depression group presented increased current and lifetime suicide ideation compared to the groups with depression alone or without depression, or personality disorders they also had increased history of suicide attempts which were often multiple attempts. OCD is associated with a high risk for suicidal behavior. Depression and hopelessness are the major correlates of suicidal behavior [73]. Suicidal behavior is not a common phenomenon in OCD, but among single patients in particular, accompanying depression, symmetry/order obsession, and compulsions are high risk factors for suicide [74]. In patients with OCD, risk factors for suicidal behavior have been left ignored when compared to other anxiety disorders. However, a high ratio as 10–27% was reported for suicidal behavior. This condition shows that OCD patients may commit suicide attempt at least once in their life [16]. Besides as in OCD assistance-seeking ratio is comparatively lower than assistance search in comorbid OCD, it becomes evident that in OCD patients assistance-seeking methods should be increased in suicide prevention strategies. Suicidality has been underestimated in OCD and should be investigated in every patient, so that appropriate preventive measures can be taken.

### 5.4. Generalized anxiety disorder and suicide

Generalized anxiety disorder (GAD) is a chronic general disease among adult population but it is comparatively a less understood clinical state. Clinicians may have knowledge about the characteristics of GAD such as over anxiety, anxiety, and hypervigilance, but such symptoms may fall short in distinguishing GAD from other psychiatric disorders, because in the course of several mental diseases these symptoms are frequently observed. Interestingly enough, despite the changes in diagnosis criteria, prevalence predictions for GAD are quite consistent

among epidemiologic studies. It is predicted that among general population, lifelong prevalence is 5% (DSM-III and/or DSM-IV-R criteria). GAD is common in different levels among gender, ethnics, and social groups. Among age 40 and above women, in addition to high ratio as 10%, in the cases applying to primary care service, GAD is 8%. Again in the first primary care service, GAD is the most widely diagnosed anxiety disorder. GAD's age of onset is different than other anxiety disorders. Prevalence ratios are low among teenagers and young adults but age is a remarkably triggering effect. Women are, compared to men, at higher risk. GAD is more frequent among unemployed housewives with chronic medical diseases [75]. GAD is frequently associated with accompanying depression, other anxiety, and somatoform disorders [76]. Weak family relations, codiagnosed C group personality disorders in stressful life events and codiagnosed Axis 1 disorders, are the increasing factors of GAD's effects [77]. GAD is quite prevalent all over the world but the relation between GAD and suicidal behavior has not been investigated. There are a limited number of studies on this topic. In another study, it was detected that there is a relation between impairment and suicidal ideation and GAD [29]. Zimmerman and Chelminski [78] found that depressed patients with GAD had higher levels of suicidal ideation when compared to patients with depression only. In future studies, analyzing the impact of GAD on suicidal behavior may be illuminating on the potential risk factors.

### **5.5. Social anxiety disorder (social phobia) and suicide**

Life-long prevalence of social anxiety disorder is 13%, which is a quite high ratio among general public. Not only it leads to a major loss of ability but it is often associated with increased suicide ratios and codiagnosed drug abuse; but the relation between social anxiety disorder and suicidal behaviors has not been analyzed adequately so far. The characteristics of patients with social anxiety disorder are that they unrealistically fear that others will constantly and persistently criticize their acts. Social anxiety disorder usually springs up during puberty and it really emerges for the first time after age 25 [79]. Rates of social anxiety disorder were highest among women and persons who were younger, less educated, single, and of lower socioeconomic class. SAD is a common illness often followed by comorbid MDD and alcohol dependence. SAD with comorbid MDD predicts a substantially elevated risk of alcohol dependence and suicide-related symptoms, stressing the need for early SAD detection [80]. It has been reported that despite the high frequency of suicidal ideation among patients with anxiety disorder, the level of suicide attempt is low. Furthermore, the data show that in social anxiety disordered cases, the ratio of lifelong suicide attempt is 12–18% but this condition is associated with codiagnosed depression symptoms [81]. It is also reported that 69% of patients with social anxiety disorder are afflicted with other lifelong comorbid mental disorders and with the occurrence of social anxiety usually, they are added into clinical picture. Once contrasted with people having no mental disorder, uncomplicated social anxiety disorder is found to be connected with increased suicidal ideation, financial dependency, and having sought medical treatment. Nonetheless, no connection was established between social anxiety disorder and suicide attempt and psychiatric treatment. It has been reported that in social anxiety disorder there is elevated suicide attempts, but these cases are surprisingly comorbid cases. In the absence of comorbidity, social anxiety disorder is still a problem that spoils the functionality,



but patients rarely seek psychiatric treatment; hence large numbers of cases cannot be examined well by the clinicians [82]. The effect of anxiety disorder alone on suicide behavior has not yet been established but when social anxiety disorder's chronic course and adverse impact on functionality are considered, particular attention needs to be paid in the assessment of patients in this group.

Comparison of the suicidal behaviors of the specific anxiety disorders is given in Table 1.

Specific anxiety disorders	Suicide ideation	Suicide attempt	Completed suicide
Panic disorder	++++	++++	?
Posttraumatic stress disorder	+++	+++	?
Obsessive-compulsive disorder	+/?	?	?
Social anxiety disorder	?	?	?
Generalized anxiety disorder	?	?	?
Simple phobia	?	?	?

Strong evidence: +++, Evidence: +, No clear evidence +/?, No data: ?

**Table 1.** Specific anxiety disorders and suicidal behaviors

## 6. The comorbidity of anxiety disorders in other illnesses and suicide

Anxiety disorders, when accompanied with other comorbid mental disorders, may affect the course and treatment of disease. Comorbid conditions may occasionally lead to diagnostic ambiguity, and in a number of cases, multiple comorbid mental disorder may accompany the present clinical picture. In a research conducted by Sanderson et al. [83], it was reported that among 70% of patients with anxiety disorder, there is minimum one additional Axis 1 diagnosis. In present study, the highness of comorbidity ratio draws attention. However, once considered that current diagnosis systems are largely consisting of joint symptom clusters, these ratios appear to be exaggerated predictions. Nevertheless, mental disorder comorbidity is considered negative for the natural course of illness by implying additional kinds of dysfunction depending on whether it is a disorder of mood, substance abuse, or personality [84, 85]. These three are the most common comorbid disorders.

### 6.1. The comorbidity of anxiety disorders in mood disorders and suicide

The potential association between anxiety disorders and suicidal ideation rendered mixed results. In the researches, positive findings between anxiety and suicidal ideation may be



connected to accompanying depression. In patients diagnosed with anxiety disorder not positing mood disorder story, there was no increased risk for suicidal ideation. On the other hand, in a recent study, it has been reported that among anxiety disordered cases not accompanied with mood disorder, there is an increased risk for suicidal ideation [86]. Nonetheless, in current research, subsyndromic depression symptoms have not been excluded, which puts the findings of research open to discussion. Traditionally, research on suicide has emphasized relationships with mood disorders, psychotic disorders, and some personality disorders. Although certain features of anxiety have been incorporated into models of suicide, anxiety-related conditions such as severe psychic anxiety, agitation, and panic have typically been examined as predictors of suicidal behaviors only to the extent that they overlap with mood disorders. Sareen et al. [16] in their 3-year long monitoring studies probed into the relation between anxiety and mood disorder–diagnosed cases and lifelong suicide ideation and suicide attempt, and they found out that in the presence of an anxiety disorder not positing a mood disorder story, there is a significant relation between lifelong suicidal ideation and suicide attempt. However, the main limitation of their study is that while analyzing particular anxiety disorders, probable mixing factors (syndromal depressive symptoms, etc.) have not been excluded. Despite this, there is fairly strong evidence that even subthreshold depressive symptoms are associated with increased psychosocial impairment, higher rates of comorbid substance use problems, and greater risk for future syndromal depressive episodes [87]. Further, studies provide strong evidence for an additive and interactive relative risk conveyed by cooccurring anxiety and depression. Consequently, comprehensive suicide assessment plans are strongly recommended when evaluating or treating individuals with an anxiety disorder, and especially individuals with comorbid anxiety and depressive disorders [88].

## **6.2. The comorbidity of anxiety disorders in bipolar disorder and suicide**

Clinical and epidemiological studies have provided convincing evidence that comorbid anxiety disorders are relatively prevalent among patients with bipolar disorder (BD), found in up to 65% of cases [89]. Henry et al. [90] studied 318 inpatients including bipolar I and found that 24% had at least one lifetime anxiety disorder and 11% of the patients had more than one such disorder. Comorbidity of anxiety disorders may be associated with greater suicidality, substance abuse, resistance to pharmacological treatment, and poor outcome [91-93]. Altındag et al. [94] studied 70 outpatients including bipolar I and found that 27.1% had at least one lifetime anxiety disorder, and most common anxiety disorders in this sample were obsessive-compulsive disorder (12.8%) and specific phobia (12.8%), followed by panic disorder (5.7%). Anxiety disorder comorbidity appears to be associated with greater number of hospitalizations, psychotic symptoms, and suicide attempts in patients with bipolar disorder type I. Bipolar subjects with anxiety disorders were younger, had earlier age at onset of illness, and were overrepresented by female subjects and those with earlier onset illness compared to those without anxiety disorder [95]. Panic disorder, which also confers an independent risk of suicide and psychiatric comorbidity, in general has been found to amplify suicidality in mood-disordered patients [96]. The presence of comorbid panic disorder in individuals with bipolar disorder may confer an increased risk of suicide risk. Some papers' reviewed have conflicting conclusions but the majority of papers support an increased risk. Future research should study

specific bipolar subgroups, focus on anxiety and panic symptoms rather than diagnosis, and look at the role of specific pharmacological treatment in patients with comorbid mood and anxiety disorders. Among anxiety disorders, only social phobia (SP) was significantly associated with history of suicide attempt in BD. In other words, SP is an important risk factor for suicidal behavior in BD [97]. Suicide takes significantly different forms within different stages of behavioral bipolar disorder. Suicide attempts and suicidal ideation have been found to be most closely connected to the depressive periods of disease. Severity of despair and depression are the key indicators of risk for all stages [98]. Previous studies have shown a significant relationship between suicide ideation and mixed depression. The rates of mixed depression among bipolar and nonbipolar depressive suicide attempters were much higher than previously reported among nonsuicidal bipolar II and unipolar depressive outpatients, suggesting that suicide attempters come mainly from mixed depressives with predominantly bipolar II base. Irritability and psychomotor agitation were the strongest predictors of suicide attempt [99]. Although anxiety may be a modifiable suicide risk factor among bipolar patients, anxiety disorder comorbidity has not been highlighted as critical in identification of high-risk individuals nor has its treatment been integrated into suicide prevention strategies. Although lifelong anxiety disorders are related to past suicide attempts, current comorbid anxiety disorders are found to be connected to suicidal ideation. In anxiety disordered individuals, suicidal ideation is a risk factor for suicide behaviors in future. The early onset of bipolar disorder and frequent appearance of rapid cycling and mixed periods constitute great risk for suicidal behavior. All in all, both bipolar disorder and anxiety disorder bear risks for suicidal behavior. In the presence of comorbid anxiety disorders, suicide behavior risk may gain even further impetus in bipolar disorder cases. To put differently, anxiety disorders (social anxiety disorder at most) may play active role in developing suicidal ideation and suicide attempt among bipolar disordered cases [100]. In the presence of comorbid anxiety disorders in bipolar disordered cases, patients must be attentively monitored against suicidal risk. Further studies shall contribute to better comprehending suicide behavior in bipolar disorder patients with anxiety disorder.

### **6.3. The comorbidity of anxiety disorders in substance abuse and suicide**

The high prevalence of comorbid drug abuse in anxiety disorders is attributed to patients' relief seeking in alcohol and/or drugs for alleviating the emotional stress they cope with (self-medication). Regardless of the high ratios of alcohol and drug use in anxiety disorders, self-medication has been discussed in limited numbers of studies. Likewise although in mood disorders there is high frequency of alcohol and drug abuse, there is a limited body of research on this domain. The use of alcohol and drugs to relieve affective symptoms is common among individuals with mood disorders in the general population [101]. Comorbid specific mood and anxiety disorders and specific drug use are widely common in American society. Among women in particular comorbid psychiatric disorders may lead to critical use of illegal drugs. In present study, it was reported that among female cases diagnosed with comorbid mood and anxiety disorder, in comparison to postdrug-alcohol addicted men, medical prognosis of disease is affected more negatively [102]. Among cases with anxiety disorder self-medication has been associated with accompanying mood disorders, drug abuse, anxiety, suicidal

ideation, and increased risk for suicide attempt. Even after controlling sociodemographic and psychiatric variances self-medication remained to be related to suicidal ideation and increased risk for suicide attempt. Bolton et al. [103] reported that individuals with anxiety disorders who self-medicate their symptoms with alcohol or drugs may be at increased risk for mood and substance use disorders and suicidal behavior. In this study covering a wide sampling of society, self-medication prevalence varied between 7.9% (social phobia and speech subtype) and 35.6% (GAD). Multivariate analyses put forth that self-medication is independently related to lifelong suicidal ideation and attempts and also to an increased comorbid mood disorder and drug abuse tendency. Alcohol use disorders and suicidal ideation cooccur, yet few studies have investigated the risk and protective factors that influence their comorbidity. The comorbidity between alcohol use disorders and suicidal ideation is characterized in young women by cooccurring psychopathology, drinking to cope, and negative life events [104].

#### **6.4. The comorbidity of anxiety disorders in schizophrenia and suicide**

Among schizophrenic patients, there is a considerably high ratio of suicidal behavior. It is particularly noteworthy that among schizophrenic cases with suicide attempt story and suicidal ideation in the past, there is also comorbid OCD. Also the ones with suicide story are significantly higher in patients with OCD-schizophrenia than in patients with non-OCD schizophrenia. Compulsive symptoms were significant predictors of suicide attempt among patients with schizophrenia [105]. The obsessive-compulsive symptoms may account for the emergence of suicidality in patients with OCD-schizophrenia. In schizophrenia suicidal ideation has been auspicated with depressive mood, anxiety, low self esteem, negative disease perceptions, negative assessments of the self and others, and daily alcohol consumption. The frequency of coping with audio hallucinations and delusions has no connection with suicidal ideation but distress caused by positive symptoms was found to be related to suicidal ideation [106]. Affective dysfunction, including distress in response to hallucinations and delusions, was a key factor associated with suicidal ideation in individuals with psychotic relapse.

#### **6.5. The comorbidity of anxiety disorders in major depression and suicide**

In elderly persons with major depressive disorder, coexisting generalized anxiety disorder or panic disorder is associated with more severe symptoms and poorer short-term treatment outcomes. De Luca et al. [107] found evidence that comorbid generalized anxiety disorder or panic disorder is associated with a greater decline in memory in late-life MDD and suicidal ideation. The clinical correlates of comorbid anxiety and depression in a sample of older patients with major depression. In elderly patients with anxious depression, psychosocial support and suicidal ideation should be assessed [108]. Anxiety symptoms are the frequent comorbids of old-age depression; hence MDD comorbid with subsyndromal anxiety symptoms is termed as "anxious depression." In reality, MDD is generally comorbid with specific anxiety disorders but there is no definite information on the frequency, diagnosis, clinical course, and treatment approaches for anxiety disorders among elderly group. It is acknowledged that specific anxiety disorders, anxiety disorders comorbid with MDD, are less common among the elderly. Still, in aged people with anxious depression, particularly in complex cases

comorbid with chronic physical disease, there is a heightened risk for suicidal ideation, disability, and poor prognosis. Standard pharmacotherapy could be sufficient for depression but among many older people with anxious depression. Standard pharmacotherapy on its own may fail to be sufficient. There are a number of psychosocial treatments but they are not specific for old-age anxious depression. However, psychosocial interventions may be a major constituent in the treatment of these patients [109]. In the elderly group, ratios of completed suicide are significantly higher than the other age groups, thus in preventing old-age suicides, the elderly cases diagnosed with “anxious depression” must be studied attentively.

#### **6.6. The comorbidity of anxiety disorders in physical illness and suicide**

Suicidal ideation and behavior have been associated with a variety of neurological illnesses. There are important linkages between suicidal ideation and behavior and neurological conditions, including epilepsy, multiple sclerosis, and amyotrophic lateral sclerosis [110]. Anxiety disorders are common in patients with multiple sclerosis, but are frequently overlooked and undertreated. Korostil and Feinstein [111] studied 140 outpatients including multiple sclerosis and found that 35.7% had at least one lifetime anxiety disorder, and most common anxiety disorders in this sample were panic disorder (10%) and obsessive-compulsive disorder (8.6%), followed by generalized anxiety disorder (18.6%). Subjects with an anxiety disorder were more likely to be female, have a history of depression, drink to excess, report higher social stress, and have contemplated suicide. Risk factors include being female, a comorbid diagnosis of depression, and limited social support. Clinicians should evaluate all multiple sclerosis subjects for anxiety disorders, as they represent a treatable cause of disability in multiple sclerosis. The studies have observed a strong relationship between coronary artery disease (CAD) and psychiatric disorder, notably depression, anxiety, and panic attacks. A significant positive relation was observed between CAD and lifelong prevalence of suicide attempts. Suicide attempts were found to be connected with major depression and comorbid anxiety disorder but no relation was detected between suicide attempts and anxiety singly. At the end of logistic regression analysis, the relation between suicide attempt and CAD continued after making correction for depression and anxiety. In a different saying, CAD is an independent risk factor more powerful than depression for suicide behavior [112]. Acne is a common disease in adolescence with female preponderance. It could cause poor self-esteem and social phobia. Previous studies based on questionnaires from several thousands of adolescents showed that acne is associated with major depression and suicide [113, 114]. However, the gender- and age-specific risk of depression and suicide in patients with acne remain largely unknown. The risk is additive in women with acne. Similar additive risk of suicide was noticed in women with acne. In recently, Yang et al. [115] reported that acne and gender, independently and jointly, were associated with major depression and suicide. Special medical support should be warranted in females with acne for the risk of major depression and suicide. It has been demonstrated that a correlation exists between an extensive scope of physical diseases and increased ratios of suicide. As the studies on particular topic are examined, it surfaces that medical diagnoses alone are not sufficient causes to lead a person to suicide. Comorbid mental disorders are equally responsible in the development of suicide. It is thus important to train the clinicians on identifying not only physical symptoms but mental



symptoms too and the ways to determine their effects on the treatment and the course of disease. To have a lifesaving effect, particular attention to crisis periods, stages of physical illness, and postdischarge period should be monitored attentively on accounts of being risk-posing periods for suicide behavior. It is thus obviously crucial to monitor physically sick patients to stay alert against suicide behavior.

### **6.7. The comorbidity of anxiety disorders in personality disorders and suicide**

A comprehensive metaanalysis to identify the proportions of comorbid personality disorders (PD) across the major subtypes of anxiety disorders has not previously been published. Friborg et al. [85] reported that the rate of any comorbid PD was high across all anxiety disorders. The findings reveal that Group C personality disorders are two times more common compared to Group A and B personality disorders, and within Group C personality disorders, the highest ratio was seen in avoidant PD, followed alternately by obsessive-compulsive and the dependent personality disorder. In cases where personality disorders are codiagnosed with anxiety disorders, the course and treatment response of the disease may alter. It has, for instance, been reported that in social anxiety disorder where PTSD provides a heterogeneous clinical picture, there is a high ratio of comorbid with avoidant PD. Except early onset, avoidant PD rendered insignificant or minor impacts on social anxiety disorder. No relation could be established between gender or length of anxiety disorder and personality disorder comorbidity. Patients with social phobia (61%) and generalized anxiety disorder (49%) were most often diagnosed with a personality disorder. Patients with simple phobia were rarely diagnosed with a personality disorder (12%) [83]. In a different study, it has been illustrated that present or lifelong panic disorders are related with borderline, avoidant, and dependent personality disorders; social anxiety disorder connected with avoidant personality disorder; and obsessive-compulsive disorder associated with obsessive-compulsive and avoidant personality disorders. In anxiety disorders comorbid with personality disorders, unlike anxiety disorders with no personality disorder, there has been a more chronic course, increased suicidal behavior, and low level of functionality [116]. The relationship between cooccurring personality disorders and anxiety disorders (panic disorder with or without agoraphobia, social phobia, and generalized anxiety disorder) was examined, taking into account the effect of major depression. Generalized anxiety disorder, social phobia, and major depression were positively associated with the occurrence of one or more personality disorders, whereas panic disorder with agoraphobia was not associated [117]. The effect of comorbid personality disorders in obsessive-compulsive disorder is unclear. Baer and Jenike [118] in their research covering 96 OCD adult patients detected that in patients with mixed personality disorder, the length of OCD is longer compared to the ones with no OCD. The authors argued that the impacts of personality disorders on behavior and life style can be secondary OCD. The studies indicate that most individuals with OCD have comorbid personality disorders (PDs), particularly from the anxious cluster. However, the nature and strength of this association remains unclear, as the majority of previous studies have relied heavily on clinical populations. Personality pathology is highly prevalent among people with OCD who are living in the community and should be routinely assessed, as it may affect help-seeking behavior and response to treatment [119]. Latas and Milovanovic [120] in a recent study proved that in



anxiety disorder cases, personality disorders exhibit quite a high prevalence as 35% in posttraumatic stress disorder, 47% in panic disorder with agoraphobia and generalized anxiety disorder, 48% in social phobia, and 52% in OCD. In anxiety disorder cases, the highest ratio (39%) was found in Group C personality disorders. Also in samplings with personality disorders, high ratio of anxiety was detected particularly among borderline personality disorder cases. It is agreed that borderline personality disorder is a high risk factor for recurrent suicidal behavior. Personality disorders comorbid with anxiety disorder display a number of clinical outcomes such as suicide risk and more severe and less treatable anxiety disorders, thereby clinicians should place particular emphasis on identifying potential personality disorders in patients with anxiety disorder. Further studies should focus on the causes and risk factors for suicidal behavior particularly in patients with anxiety disorders comorbid with personality disorders.

## 7. Treatment studies

The basic principles of treatment of anxiety disorders in major depression involve longer treatment and higher doses than are usually required for major depression. The impact of psychosocial disability and severity of depressive symptoms can be ameliorated with appropriate treatment. Screening for depressive symptoms as well as administering an appropriate therapy seems the best way to prevent suicide attempts [121]. Newer treatments, such as the combination of psychotherapy and pharmacotherapy, may prove to be of greatest benefit for individuals with comorbidity of anxiety disorders in psychiatric disorders [122]. For the recent 25 years, much progress has been made in the treatment of five specific anxiety disorders such as social phobia, obsessive-compulsive disorder, generalized anxiety disorder, and posttraumatic stress disorder. Placebo-controlled evidences suggest that pharmacological and psychological treatments offer substantially effective solutions [21, 123]. Treatment of anxiety disorders involve antidepressants (selective serotonin reuptake inhibitors (SSRI) mostly) and cognitive behavioral therapy. Among patients diagnosed with mood disorder and comorbid anxiety disorders, it is advisable to administer higher doses of SSRI [124]. Besides, a long-term discussion has been going on about the use of SSRIs (paroxetine, fluoxetine, and citalopram) which, as some argue, may have a triggering/stipulating effect on adult suicides since 1991 and children since 2002. Apter et al. [125] stated that paroxetine taking adult patients with major depression are at higher risk for suicidal ideation and behavior, and the same authors also claimed that there was no attempt in OCD and social phobia cases. In sync with this finding, the benefits of sertraline outweigh its potential risks in suicidal behavior among OCD patients, and OCD's effects are, in contrast to its effects in major depression, further positive [126]. In younger patients diagnosed with major depression, the risk of suicidal behavior uncovered with treatment is even higher. It is suggested that the rise in suicidal ideation and attempt parallel to the use of antidepressants is more risky for children and teenagers [21, 123]. Rickels et al. [127] in their two randomized controlled studies reported the positive effects of long-released venlafaxine on GAD. Among children and teenagers major depression and in GAD patients with venlafaxine, there might be a stage between suicidal behaviors and

hostile behaviors. Antidepressant drugs play a vital role in the treatment of anxiety disorders and preventing suicidal behaviors among adult patients. Selective serotonin reuptake inhibitors are the first-line pharmacological treatment for these disorders, and that newer serotonin and norepinephrine reuptake inhibitors show significant promise, especially for comorbid cases. In the treatment of anxiety disorders, cognitive behavior therapy (CBT) can be applied in combination with pharmacotherapy or independently. For instance, in the treatment of panic disorder, CBT aims to control agoraphobic symptoms in panic disorders comorbid with agoraphobia, to inhibit adverse effect of medicine deduction and treatment and prevention of panic attacks. Not much study has been made on the effects of CBT applications in anxiety disorders on suicidal behavior, but when anxiety disorder cases are successfully treated with CBT there is likelihood to witness fewer ratios of suicide [128]. When anxiety disorders are comorbid with depression, disease symptoms are likely to be more severe; hence symptom severity should be taken into account while making treatment plan. Particularly speaking, patients diagnosed with panic disorder, PTSD, and comorbidity of anxiety disorders in major depression bear higher risks for suicide. The cases bearing potential risks for suicide should be kept and monitored under strict scrutiny by clinicians. In order to assess and monitor these patients, there is a need for relevant measurement tools of which reliability and validity tests have been confirmed. In suicide behavior treatment studies among anxiety disorders, ethic limitations have restricted the participation of individuals with acute suicidal tendency. In relevant studies, the lowness of suicidal behavior and restricted volume of samplings inhibited a precise detection of the real effect of treatments. As we consider the fact that various factors interact in the emergence of suicidal behavior, it is probable that drug effect may be regulated in the same way with the interactions among such factors. The fact that no treatment study manages to equally control the risk factors among treatment groups makes it hard to identify the causal factors in suicide-relevant cases. Furthermore, in the analysis of SSRIs, short-term risks alone were examined; hence it is a requirement to detect long-term risks and create future-oriented study designs with wider databases and closer monitoring procedures. There is a need for more research to develop a guideline/protocol exclusively for suicide prevention in patients with anxiety disorders.

## 8. Conclusion

Traditionally, anxiety disorders have not been viewed as independent risk factors for suicidal behavior, and therefore assessment of anxiety disorders has not been particularly emphasized in clinical enquiries, and suicide screening tools specific anxiety disorders (e.g., generalized anxiety disorder, panic disorder, and obsessive-compulsive disorder) may be independently associated with suicidality, to which they particularly contribute when they are comorbid with bipolar disorder, personality disorders, depression, schizophrenia, and substance use disorders. Despite methodological issues, these findings should prompt clinicians to evaluate more specifically the impact of anxiety disorders on suicidal behavior, particularly when they are comorbid. Further research into treatment of anxiety disorders in relation to preventing suicide is required.

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