

# Prevalence and Consequences of the Dual Diagnosis of Substance Abuse and Severe Mental Illness

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The co-occurrence of a severe mental illness and a substance use or abuse disorder is common in the United States as well as internationally and could be considered as more the expectation than the exception when assessing patients with serious mental illness. Substance use disorders can occur at any phase of the mental illness, perhaps even inducing psychosis. Causes of this comorbidity may include self-medication, genetic vulnerability, environment or lifestyle, underlying shared origins, and/or a common neural substrate. The consequences of dual diagnosis include poor medication compliance, physical comorbidities and poor health, poor self-care, increased suicide risk or aggression, increased sexual behavior, and possible incarceration. All of these factors contribute to a greater health burden, which reduces the health care system's capacity to adequately treat patients. Therefore, screening, assessment, and integrated treatment plans for dual diagnosis that can address both the addiction disorder and the mental illness are recommended in order to provide accurate treatment, after-care, and other health care to accommodate patients' social and vocational needs.

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The presence of comorbid substance use disorders in patients with severe mental illness is common. Unfortunately, often neither of the illnesses has been identified, and when one illness is recognized, the other disorder may remain overlooked and untreated. Accurate dual diagnosis of substance use disorder in patients with severe mental illness, such as bipolar disorder or schizophrenia, is necessary to understand the prevalence of this comorbidity, its impact on individuals and society, and possible treatment options for recovery.

## DEFINITION OF DUAL DIAGNOSIS

Dual diagnosis, as referenced here, refers to the co-occurrence of substance use disorders, i.e., the use of, abuse of, or dependence on nicotine, alcohol, and/or illegal drugs, with a severe mental illness such as bipolar disorder or schizophrenia. The level of severity of both the substance use disorder and the mental illness must be determined to assess fluctuations across the various patient populations. For example, one patient may have a severe

mental illness with a partial addiction disorder that is unrecognized. Another patient may have a serious addiction disorder with a mild mental illness that is overlooked. Therefore, the construction of a matrix that places both the mental illness and the substance use disorder along a continuum of severity is helpful in conceptualizing dual diagnosis and its heterogeneity in presentations to clinicians (Figure 1).

## OCCURRENCE OF DUAL DIAGNOSIS

Figures on the extent of the association between substance use disorders and severe mental illness are staggering. An epidemiologic study<sup>1</sup> conducted in 2003 by the U.S. Substance Abuse and Mental Health Services Administration (SAMHSA) reported that 19.6 million adults aged 18 years or older had a severe mental illness. Of those adults, 27% used an illicit substance within the past year and 21% were dependent on or abused drugs, as compared with 13% and 8%, respectively, of individuals without a severe mental illness. Furthermore, in the overall study population, adults who used illicit drugs (18.1%) and those with substance abuse or dependence (21.6%) were more than twice as likely to have a serious mental illness than adults who did not use (7.8%) or abuse (8.0%) illegal substances. The survey estimated that there may be upwards of 4.2 million U.S. adults with dual diagnosis. The President's New Freedom Commission on Mental Health<sup>2</sup> estimated that the co-occurrence of severe mental illness and substance use disorders is present in 7 to 10 million children and adults in the United States, and, if

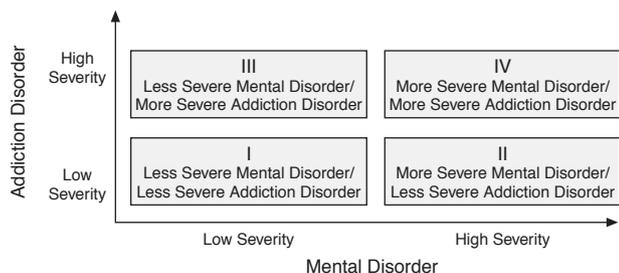
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Figure 1. Matrix of Severity for Mental Disorder and Addiction Disorder



these individuals receive treatment, it is usually for only 1 of the 2 disorders.

The Epidemiologic Catchment Area (ECA) Study<sup>3</sup> remains one of the most comprehensive evaluations of the prevalence of mental health and addictive disorders in the United States. This landmark study examined the co-occurrence of severe mental illness and substance abuse disorder across 5 sites used to represent the U.S. population. The results indicated that patients with schizophrenia or bipolar disorder had substantial comorbidity of substance abuse disorders (Table 1). Compared with the general population, patients with schizophrenia were almost 5 times more likely to have a substance abuse diagnosis, 3 times more likely to have an alcohol disorder, and 6 times more likely to have drug (other than alcohol) disorders. Similarly, patients with bipolar disorder were 11 times more likely to have other drug abuse or dependence than those patients without bipolar disorder.<sup>3</sup> The U.S. National Comorbidity Survey reported that, of those respondents with a lifetime alcohol or drug use disorder, 51.4% met the criteria for a lifetime mental disorder, and, of those patients with a lifetime mental disorder, 50.9% had a history of an alcohol or drug use disorder.<sup>4</sup> Follow-up interviews of 454 of the 5877 survey respondents determined that 28% of individuals confirmed the presence of one or more psychotic symptoms that were identified in the original survey.<sup>5</sup>

It is important to highlight that dual diagnosis does not exist solely in the United States. Several international studies<sup>6-11</sup> on schizophrenia and comorbid substance use disorders have shown prevalence rates similar to or higher than those of the ECA Study<sup>3</sup> (Table 2). According to these studies, dual diagnosis was more common in unmarried males,<sup>7,9,11</sup> and patients with regular substance use had poorer psychosocial adjustment<sup>10</sup> and hospitalization rates almost twice that of patients without substance use disorders.<sup>9</sup> Furthermore, alcohol abuse was reported considerably more frequently than any other substance abuse in 4 of the 6 studies.<sup>7,8,10,11</sup> Obviously, dual diagnosis is a substantial problem around the world.

There is some understanding of the pattern of substance use in patients with schizophrenia. Many patients practice

Table 1. Lifetime Prevalence Rates From the Epidemiologic Catchment Area (ECA) Study<sup>a</sup>

| Comorbid Disorder                       | Schizophrenia (%) | Bipolar Disorder (%) |
|---|-------------------|----------------------|
| Any substance abuse or dependence       | 47                | 56                   |
| Any alcohol diagnosis                   | 34                | 44                   |
| Any alcohol dependence                  | 24                | 28                   |
| Alcohol abuse only                      | 10                | 16                   |
| Any drug (other than alcohol) diagnosis | 28                | 34                   |
| Any drug dependence                     | 13                | 22                   |
| Drug abuse only                         | 15                | 12                   |

<sup>a</sup>Adapted with permission from Regier et al.<sup>3</sup>

Table 2. Substance Use Disorder Rates in International Patients With Schizophrenia

| Authors                      | Prevalence (%) | Time Period | Country     |
|------------------------------|----------------|-------------|-------------|
| Fioritti et al <sup>6</sup>  | 47             | Lifetime    | Italy       |
| Fowler et al <sup>7</sup>    | 60             | Lifetime    | Australia   |
| Jablensky et al <sup>8</sup> | 36             | Lifetime    | Australia   |
| Menezes et al <sup>9</sup>   | 36             | One year    | England     |
| Modestin et al <sup>10</sup> | 54             | Current     | Switzerland |
| Soyka et al <sup>11</sup>    | 43             | Lifetime    | Germany     |

polysubstance abuse and, for example, may smoke cigarettes, drink alcohol, and also misuse/abuse cannabis. According to research, of patients with schizophrenia, 58% to 90% use nicotine,<sup>12-15</sup> 25% to 45% use alcohol,<sup>13,16,17</sup> 15% to 50% use cocaine,<sup>16,18,19</sup> and 31% use cannabis,<sup>16</sup> which signifies a considerable amount of overlap within the substance abuse groups. Another study<sup>20</sup> of patients with schizophrenia indicated that multiple substance use was self-reported by 55% of dual diagnosis patients, and a lifetime diagnosis of multiple substance use disorders was clinician-reported for 72% of the patients. In a group of patients with bipolar disorder or schizophrenia, Verdoux et al.<sup>21</sup> found that the lifetime prevalence rate of abuse of or dependence on 2 or more substances was 48%. A study<sup>22</sup> of patients with first-episode bipolar disorder and polysubstance abuse found that patients with alcohol dependence had more depressive symptoms and patients with cannabis dependence had more manic symptoms as compared with patients with no substance use disorder, although the results were not significant. Additionally, patients with bipolar disorder who used 2 or more substances had substantially worse outcomes than patients with only bipolar disorder.<sup>22</sup>

Substance use can also occur at any phase of severe mental illness and is not simply a later response to the chronicity of the illness. Patients with schizophrenia or bipolar disorder are not necessarily demoralized into abusing alcohol or other drugs in order to cope with the illness after experiencing symptoms and being diagnosed; instead, abuse may occur at the onset of the illness or prior to it. For example, a study<sup>23</sup> of patients with first-episode schizophrenia reported that 37% of subjects had a lifetime

diagnosis of substance use disorder during their first episode of psychotic symptoms. Of that 37%, 28% of patients had a lifetime diagnosis of cannabis use and 21% of patients had a lifetime diagnosis of alcohol use disorder. Compared with those individuals who did not practice substance abuse, patients with first-episode schizophrenia and substance abuse were more likely to be male; to have an earlier age at onset, a more severe illness, and a longer duration of untreated illness; and to show a poorer response to pharmacotherapy. A comparable study<sup>24</sup> of patients diagnosed with first-episode psychotic mania showed that 32% of patients abused drugs and 20% of patients abused alcohol. Antecedent alcohol abuse was associated with a later onset of bipolar disorder; however, antecedent abuse of both drugs and alcohol was related to earlier hospitalization. These results posit that substance abuse may facilitate the first episode of psychosis.

Physicians are often faced with the complex dilemma of trying to distinguish whether the patient's initial presentation of psychosis is either drug-induced or primary. In reality, the distinction is best made over the course or abatement of psychotic symptoms, especially in the absence of continued drug abuse. In a recent study,<sup>25</sup> interviews were conducted with 400 patients who exhibited at least 1 psychotic symptom, had no inpatient psychiatric history prior to the past 6 months, and had used drugs or alcohol within the past 30 days to assess the psychosis as the primary condition or as drug-induced. The results showed that 56% of the patients had schizophrenia as a primary psychosis and 44% experienced the psychotic symptoms as a substance-induced psychosis. The drug-induced-psychosis group was more likely to have parents who abused substances, have more frequent diagnoses of substance dependence, report more visual hallucinations, and have slightly fewer positive and negative symptoms, although this was not a distinguishing factor.

### EXPLANATIONS FOR CO-OCCURRENCE

Several possible explanations for the co-occurrence of schizophrenia or bipolar disorder with substance use disorder have been suggested. One area of concern, as discussed above, is that mental illness may be induced by the use of substances. In international epidemiologic studies<sup>26,27</sup> of the association between schizophrenia and cannabis use, the results indicated that individuals who developed schizophrenia had a high prior use of cannabis; their relative risk of cannabis use was 3 times higher than that of the general population. The outcomes of these studies imply that the duration of exposure to cannabis may lead to a higher development rate of schizophrenia, which suggests that there may be a dose-dependent relationship between schizophrenia and cannabis use. On the other hand, mental illness may lead to increased drug-seeking behavior as a response or coping mechanism. Patients may self-

medicate by abusing drugs and alcohol in order to alleviate the symptoms of the illness.

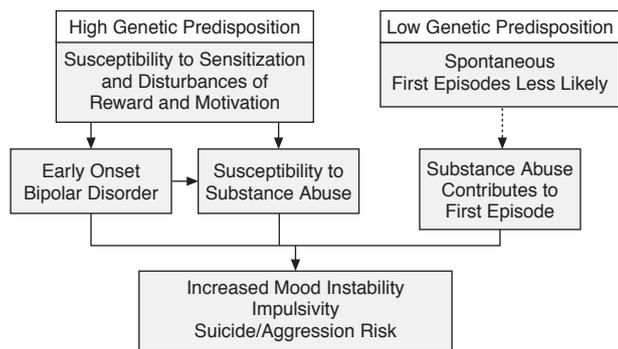
Other explanations include a possible genetic vulnerability both to mental illness and to substance abuse that is reflected by the existence of more substance abuse in families with mental illness. Most recently, Caspi and colleagues<sup>28</sup> have shown a provocative association between a greater risk for comorbid substance abuse in schizophrenia and the expression of functional polymorphisms of the catechol *O*-methyltransferase (COMT) gene. Perhaps the environment and lifestyle of individuals contribute to both the substance abuse and the schizophrenia or bipolar disorder. Also, substance abuse and mental illness may have underlying shared origins or possibly the same pathogenic events.<sup>29,30</sup>

The neurobiology of dual diagnosis suggests that there may be a common neural substrate of addiction and mental illness. A negative symptom of schizophrenia is anhedonia, the inability to experience pleasure, which may reveal a relationship in the neural circuitry between substance abuse and this psychosis. The imbalance of the neurotransmitter dopamine may cause a deficit in the reward circuitry system, which can have substantial therapeutic implications. For instance, schizophrenia is associated with dysregulation of the prefrontal cortex and hyperfunctioning of dopamine input, both of which may disinhibit reward-seeking behavior via drugs.<sup>31</sup> Therefore, understanding the roles of gene networks, the environment, and the interaction between reward motivation, inhibitory control, and individuals' behavior is necessary to better treat patients with dual diagnosis.<sup>32</sup> Swann<sup>33</sup> has proposed a vulnerability model of bipolar disorder to explain the relationship between the genetic predisposition and the susceptibility to sensitization and disturbed reward and motivation, which may heighten sensitivity to early onset bipolar disorder and enhance vulnerability to drug abuse (Figure 2). These interrelationships could also lead to broader constellations of increased mood instability, impulsivity, and possibly suicidal and aggressive tendencies, suggesting a possible extension beyond the formal definition of bipolar disorder.

### CONSEQUENCES OF SUBSTANCE USE COMORBIDITY

An all-too-common consequence of comorbid substance use disorder is the exacerbation of the symptoms of the mental illness. Substance use may destabilize patients with schizophrenia or bipolar disorder and is associated with poor medication compliance, which can result in relapse and rehospitalization. Other proximal sequelae of this association include increased risky behavior (such as promiscuity) and increased aggression or risk of suicide. Substance use in addition to a mental illness can also be associated with poorer overall health and physical

Figure 2. Vulnerability Model of Substance Abuse and Bipolar Disorder<sup>a</sup>



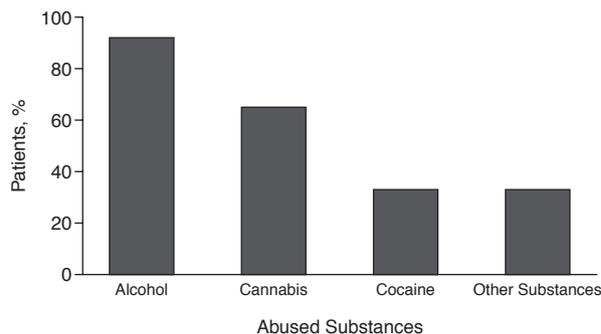
<sup>a</sup>Reprinted with permission from Swann.<sup>33</sup>

comorbidities, such as cardiovascular problems, nutritional deficits, and diabetes. Exacerbation of the mental illness, poorer self-care, and greater health burden all conspire to create an overwhelming increase in the use of health care services, not only mental health and addiction services, but also emergency room services and medical inpatient and outpatient services. This high-service population uses up many of the available resources of the health care system and, therefore, decreases the capacity and capability of health care services to adequately coordinate medical services and treat these and other patients.

Substance use in mental illness may also go undetected and undiagnosed. In these circumstances, individuals may continue to engage in risky or violent behavior, which may eventually result in incarceration. The figures on the rates of comorbidity among incarcerated persons are disturbing. A study<sup>34</sup> of a general prison population in the United States revealed a 41% prevalence rate of bipolar disorder. Among the individuals with bipolar disorder, there was a 93% comorbidity rate of substance abuse; Figure 3 shows the breakdown of the substances used. Moreover, the number of convictions of the inmates showed 1.4 convictions for those with no mental illness, 2.3 convictions for those with substance use disorder only, and 6.9 convictions for those with comorbid substance use and bipolar disorder. Similarly, in an Australian study,<sup>35</sup> the rate of conviction for patients with schizophrenia and substance use disorder (38%) was substantially greater than for those patients with only schizophrenia (12%).

Misdiagnosis, noncompliance, worsening illness, and increased hospitalization are all factors for a heightened risk of violence in individuals with serious mental illness.<sup>36</sup> In one study,<sup>37</sup> patients with schizophrenia who displayed violence were found to have a 58% lifetime comorbid diagnosis of DSM-IV substance abuse. Additionally, substance abuse at the time of a violent offense was seen in 48% of the patients. Violent patients had more positive and negative symptoms, poorer functioning, and poorer

Figure 3. Comorbid Substance Abuse in Inmates With Bipolar Disorder<sup>a</sup>



<sup>a</sup>Data from Elhaj et al.<sup>34</sup>

insight into their illness as compared with a nonviolent sample of patients with schizophrenia.<sup>37</sup>

### IMPLICATIONS FOR HEALTH CARE AND SERVICES

The key to providing integrated dual diagnosis treatment, as addressed by the President’s New Freedom Commission on Mental Health,<sup>2</sup> is to screen for the co-occurrence of mental illness and substance abuse disorders. Screening includes testing for mental illness; addictions; medical comorbidity; and risky behaviors such as suicide attempts, violence, and sexual promiscuity or intravenous needle use. Physicians should look beyond the standard, separate treatment methodologies for mental illness or substance abuse and develop integrated treatment strategies to aid patients in coping with both of the illnesses.

After the initial screening process, assessment is necessary to fully comprehend the extent of the disorders. Assessment includes an evaluation of acute risks, the severity of the mental illness and the addiction, the scope of the patient’s disabilities as well as the patient’s capacity and resources of support to overcome the dual diagnosis, and the extent to which the patient is ready to accept treatment, change, and the stages of recovery.

Once an individual has been accurately assessed, the provision of an integrated dual diagnosis treatment plan should be coordinated with aftercare and other health care to address the social and vocational needs of the patient. Integrated treatment plans are necessary for dual diagnosis patients because they cannot separate their mental illness from their substance use and, therefore, traditional, separate treatment regimens prove to be ineffective.<sup>1</sup>

### CONCLUSION

Dual diagnosis is so common that it should be considered the expectation and not the exception. Understanding

the reasons for the co-occurrence of severe mental illness and substance use may eventually help to explain the neurobiology of addiction, of mental illness, or of both. The consequences of dual diagnosis are profound, not only for the individual patient but also for society and the health care system. An efficient screening and assessment process is critical to recognize and understand the extent of both the mental illness and the substance use disorder in order to create an effective, integrated, dual-diagnosis treatment plan.

*Disclosure of off-label usage:* The author has determined that, to the best of his knowledge, no investigational information about pharmaceutical agents that is outside U.S. Food and Drug Administration–approved labeling has been presented in this article.

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