



European Monitoring Centre
for Drugs and Drug Addiction

INSIGHTS

EN

ISSN 2314-9264

Comorbidity of substance use and mental disorders in Europe

19



European Monitoring Centre
for Drugs and Drug Addiction

Comorbidity of substance use and mental disorders in Europe

Authors

Marta Torrens, Joan-Ignasi Mestre-Pintó and Antònia Domingo-Salvany
Institut Hospital del Mar d'Investigacions Mèdiques, Barcelona, Spain

EMCDDA project group

Linda Montanari and Julian Vicente

| Legal notice

This publication of the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) is protected by copyright. The EMCDDA accepts no responsibility or liability for any consequences arising from the use of the data contained in this document. The contents of this publication do not necessarily reflect the official opinions of the EMCDDA's partners, any EU Member State or any agency or institution of the European Union.

Europe Direct is a service to help you find answers to your questions about the European Union

Freephone number (*): 00 800 6 7 8 9 10 11

(*) The information given is free, as are most calls (though some operators, phone boxes or hotels may charge you).

More information on the European Union is available on the Internet (<http://europa.eu>).

Luxembourg: Publications Office of the European Union, 2015
ISBN 978-92-9168-834-0
doi:10.2810/532790

© European Monitoring Centre for Drugs and Drug Addiction, 2015
Reproduction is authorised provided the source is acknowledged.



European Monitoring Centre
for Drugs and Drug Addiction

Praça Europa 1, Cais do Sodré, 1249-289 Lisbon, Portugal
Tel. +351 211210200
info@emcdda.europa.eu | www.emcdda.europa.eu
twitter.com/emcdda | facebook.com/emcdda

Contents

5	Foreword
7	Executive summary
11	Acknowledgments
13	Introduction
15	CHAPTER 1 Comorbidity of substance use and mental disorders: theoretical background and relevance
23	CHAPTER 2 Assessment of psychiatric comorbidity in drug users
33	CHAPTER 3 Methods
35	CHAPTER 4 Epidemiological data on the prevalence of comorbid substance use and mental disorders in Europe
47	CHAPTER 5 Specific characteristics of comorbid mental and substance use disorders and clinical recommendations
57	CHAPTER 6 Treatment services for the comorbidity of substance use and mental disorders
69	CHAPTER 7 Conclusion and recommendations
73	Glossary
75	Appendix
79	References

| Foreword

The presence, or psychiatric comorbidity, of two or more mental disorders in the same person has long been recognised by mental health and drug professionals. It has been on the radar of European drug monitoring for more than a decade, since the EMCDDA published first a selected issue and then a policy briefing on the subject. More recently, in 2013, we revisited the topic and reviewed the information available from European countries. This pilot exercise identified the fact that there was a diversity of responses to this issue across the European Union, considerable interest among practice and policymakers in how to respond effectively in this area and highlighted the need for us to follow up with a more comprehensive investigation.

To that end, I am happy to present this publication, which is based on an exhaustive review of the literature and on a wealth of information provided by the Reitox national focal points. This work will provide policymakers, professionals in the drugs field and other interested readers with a detailed overview of the concept of comorbidity in the context of drug use and the tools available for its assessment. The most common combinations of co-occurring drug use and mental health disorders are described and treatment and clinical recommendations offered. The information provided by the national focal points allows the inclusion of material otherwise not readily available to researchers, either because it is unpublished or is only available in languages not fully covered by international indexing services. Based on these sources, the study presents the most comprehensive analysis to date of the available information on the prevalence of comorbid drug use and mental disorders in Europe. As an accompaniment, and also based on national focal point data, the authors have documented the measures that are taken in treatment settings across Europe to respond to comorbid mental disorders among drug users.

This study, as well as drawing on multiple sources of documentary information, is enriched by the many years of professional experience of the authors. Furthermore, the quality of the publication has benefited from the thoughtful input of a panel of reviewers drawn from the EMCDDA Scientific Committee and scientific staff.

Acknowledging and responding to the reality of the comorbidity of mental disorders among drug users is an important step towards providing better care for the many people that are affected by these interlinked problems. In this spirit I invite you to read this publication.

Wolfgang Götz

Director, EMCDDA

Executive summary

The association of harmful forms of illicit drug use with serious public health problems is a key issue for national and international drug policy. Much of the focus on the health harms associated with illicit substance use has been on blood-borne infections, such as human immunodeficiency virus (HIV) and hepatitis C. In recent decades, however, the prevalence of psychiatric disorders associated with substance use has become a matter of great concern.

The relevance of the comorbidity of mental disorders in substance users is related to its high prevalence, its clinical and social severity, its difficult management and its association with poor outcomes for the subjects affected. Those individuals who have both a substance use disorder and another comorbid mental disorder show more emergency admissions, significantly increased rates of psychiatric hospitalisations and a higher prevalence of suicide than those without comorbid mental disorders. In addition, drug users with comorbid mental disorders show increased rates of risky behaviours, which can lead to psychosocial impairments (such as higher unemployment and homelessness rates) and violent or criminal behaviour. Furthermore, clinical practice has shown that comorbid disorders are reciprocally interactive and cyclical, and poor prognoses for both psychiatric disorders and substance use disorders are likely unless treatment tackles each. That is, for people with comorbid substance use and mental disorders, there are increased risks of chronicity and criminality, treatment is difficult and costly, and chances of recovery are reduced. Taking into account the burden on health and legal systems, comorbid mental disorders among drug users result in high costs for society and lead to challenges not only for clinicians but also for policymakers.

A number of non-exclusive aetiological and neurobiological hypotheses could explain this comorbidity. For example, it may result from susceptibility to two or more independent conditions. In some cases, a psychiatric disorder should be considered a risk factor for drug use, which may lead to the development of a comorbid substance use disorder. In other cases, substance use can trigger the development of a psychiatric disorder that may run an independent course. Finally, a temporary psychiatric disorder may develop as a consequence of intoxication with, or withdrawal from, a specific type of substance; this is known as a substance-induced disorder.

The identification of psychiatric comorbidity in substance users is problematic, largely because the acute or chronic effects of substance use can mimic the symptoms of many other mental disorders. This makes it difficult to differentiate between those psychiatric symptoms that result from acute or chronic substance use or withdrawal and those that represent an independent disorder. Also contributing to the difficulties of identifying these comorbidities is the fact that psychiatric conditions are syndromes not diseases. Currently, it is usual to distinguish between 'primary' disorders, 'substance-induced' disorders, and the 'expected effects' of substance use (i.e. expected intoxication and withdrawal symptoms that should not be diagnosed as symptoms of a psychiatric disorder). To facilitate this difficult task, a number of instruments are available to assess psychiatric comorbidity in those with substance use disorders. The choice of instrument will depend on the context and setting (clinical, epidemiological or research), the time available to conduct the assessment and the expertise of staff. Standard screening instruments for substance use disorders and mental disorders should be used routinely in situations where the time available to staff or the lack of staff expertise makes the application of more extended assessments difficult. Without this screening routine, cases of psychiatric comorbidity may be missed if a patient seeks treatment in a drug treatment service with limited access to specialised mental health expertise, or if a substance use disorder is treated by a general practitioner. However, general practitioners may be not familiar with psychiatric diagnoses or with the diagnosis of psychiatric comorbidity. If a comorbid

mental disorder is detected, a definitive diagnosis and adequate treatment must be arranged.

Data on the prevalence of comorbid mental disorders among drug users in European countries are heterogeneous, although prevalence rates are higher in drug users than in the non-drug-using population. Several factors related not only to the methodological issues mentioned above, but also the geographical and temporal trends in drug use across Europe may explain this heterogeneity. Furthermore, the prevalence of psychiatric comorbidity among individuals with substance use disorders also differs by psychiatric disorder (mood disorders, anxiety disorders, psychosis, attention deficit and hyperactivity disorder, post-traumatic stress disorder, eating disorders and personality disorders) and by use of a specific drug or drugs (such as opioids, stimulants, cannabis). Finally, the setting in which the diagnosis has been carried out (primary care facilities, specific drug use treatment facilities or psychiatric services) should be considered to better understand the heterogeneity in the findings regarding the prevalence of psychiatric comorbidity among drug users in Europe.

Overall, psychiatric comorbidity has a great impact on the clinical severity, psychosocial functioning and quality of life of patients with substance use disorders. The therapeutic approach to tackle dual diagnosis, whether pharmacological, psychological or both, must take into account both disorders from the point of diagnosis in order to choose the best treatment option for each individual.

Among the psychiatric comorbidities found in those with substance use disorders, depression is the most common, with prevalence ranging from 12 % to 80 %. The co-occurrence of depression and substance use disorders is associated with a lower rate of treatment success for both the substance use disorder and depression, with a higher prevalence of attempted or completed suicide in individuals with comorbidity than in those with one disorder only. Among individuals with a substance use disorder, major depression is only more frequent in women than in men. Moreover, major depression is twice as likely among women with substance use disorders compared with women in the general population, making this group of women an especially vulnerable population and a particularly sensitive target for treatment policies.

Anxiety disorders, in particular panic and post-traumatic stress disorders, are also commonly seen in association with substance uses. Rates as high as 35 % have been reported for this comorbidity. However, despite such high prevalence rates, anxiety disorders are still underdiagnosed. Given that both intoxication by and withdrawal from illicit substances may be associated with anxiety symptoms, the diagnosis of anxiety disorders among substance-using populations is challenging.

Comorbid substance-use disorders are more common in people with psychosis, in particular schizophrenia and bipolar disorder, than in the general population. Among people with psychosis, those who are also substance users have a higher risk of relapse and admission to hospital and higher mortality. This is partly because the substances used may exacerbate the psychosis or interfere with pharmacological or psychological treatment. Comorbidity of schizophrenia and substance use disorders is common, with rates as high as 30–66 %. The most frequent drugs of use and misuse among psychotic patients, in addition to tobacco, are alcohol and cannabis and, more recently, cocaine. The combination of a psychotic disorder and drug use and misuse is associated with an exacerbation of psychotic symptoms, treatment non-compliance and poorer outcomes. The relationship between schizophrenia and cannabis use in young people is a special area of interest, owing to the high prevalence of cannabis use among young people in the European Union. The prevalence of comorbidity between bipolar disorder and substance use ranges from 40 % to 60 %. The use of large amounts of alcohol or other substances,

particularly stimulants and cannabis, frequently occurs during the manic phase of bipolar disorder. During the depressed phase, substance use may increase, with alcohol exacerbating depression, and the use of stimulants and cannabis precipitating a manic swing or an episode of mixed symptoms. The presence of a substance use disorder indicates poorer social adjustment and poorer outcomes in bipolar patients.

Illicit substance use is often associated with a personality disorder, with antisocial and borderline personality disorders being the most frequent. Those subjects with a personality disorder and a substance use disorder are more likely to participate in risky practices, which predispose them to infection with blood-borne viruses and also increase the likelihood of other medical and social complications (e.g. illicit behaviours). Furthermore, although individuals may have difficulty staying in treatment programmes and complying with treatment plans, treatment for substance use in people with personality disorders is associated with a reduction in substance use and a reduction in criminal behaviours.

In recent years, there has been increasing interest in the comorbidity of attention deficit and hyperactivity disorder (ADHD) and substance use. In a recent study in six European countries, prevalence of ADHD in substance users seeking treatment was found to range from 5 % to 33 %.

There is strong evidence to demonstrate that eating disorders and substance use disorders tend to co-occur. Among individuals with substance use disorders, over 35 % report having an eating disorder, in contrast to the prevalence of 1–3 % among the general population. The prevalence of substance use disorders differs across anorexia nervosa subtypes: people with bulimia or bingeing/purging behaviours are more likely to use substances or have a substance use disorder than people with anorexia, in particular the restricting type.

Despite the relevance of providing effective treatments for comorbid mental disorders among patients with substance use disorder, there is still a lack of consensus regarding not only the most appropriate pharmacological and psychosocial strategies but also the most appropriate setting for treatment. Patients often have difficulties not only in identifying, but also in accessing and coordinating, the required mental health and substance use services. For instance, in the United States only 44 % of patients with dual diagnosis receive treatment for either disorder, and a mere 7 % receive treatment for both disorders. An overview of the present situation in the different European countries shows that treatment for mental disorders and drug use problems is provided in different facilities, making the accessibility of treatment for these comorbid subjects more difficult.

It remains important to study the occurrence of psychiatric comorbidity in drug users, both to determine its magnitude and to help improve the coverage of adequate treatment. The adequate detection and treatment of comorbid mental and substance use disorders is one of the biggest challenges that policymakers, professionals and clinicians working in the drugs field must face in the coming years.

| Acknowledgements

The European Monitoring Centre for Drugs and Drug Addiction wishes to thank the authors for their work on this publication. In addition, the Centre is grateful to the members of the EMCDDA Scientific Committee who reviewed the manuscript. The EMCDDA also wishes to acknowledge the role played by the Reitox network of national focal points and is very grateful for the help and input provided by the following experts: Hannu Alho, Marc Auriacombe, Alex Baldacchino, Amine Benyamina, Olof Blix, Gerhard Bühringer, Iliana Crome, Zoltz Demetrovics, Lucia di Furia, Colin Drummond, Gabriele Fischer, Michael Gossop, João Goulão, George Grech, Ante Ivancic, Alexander Kantchelov, Andrej Kastelic, Konstantine Kokkolis, Claudio Leonardi, Icro Maremmani, John Marsden, Jacek Moskalewicz, Lubomír Okruhlica, Pier Paolo Pani, Luis Patricio, Lola Peris, Marc Reisinger, Michel Reynaud, Norbert Scherbaum, John Strang, Emilis Subata, Win van den Brink and Helge Waal.

Introduction

The association of harmful forms of illicit drug use with serious public health problems is a key issue for national and international drug policy. There are many negative health consequences associated with drug consumption, with the prevention both of deaths related to overdoses and drug-related blood-borne infections being issues of particular concern. In recent decades, there has also, however, been a growing recognition that the presence of psychiatric disorders associated with substance use represents a major challenge for public health responses in this area. The European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) refers to 'comorbidity/dual diagnosis' as the 'temporal coexistence of two or more psychiatric disorders as defined by the International Classification of Diseases, one of which is problematic substance use' (EMCDDA, 2004). For the purposes of this report, however, we will use the terms 'comorbidity of substance use and mental disorders' and 'psychiatric comorbidity in substance use disorders' interchangeably. While the mandate of the EMCDDA firmly sets the focus of the agency on illicit drugs, in this study, because of the nature of the evidence base, the more general term of 'substance' will be used to refer to any psychoactive substance that may be used harmfully.

The relevance of the comorbidity of substance use and mental disorders is related not only to its high prevalence but also to its difficult management and its association with poor outcomes for the subjects affected. In comparison with subjects with a single disorder, patients with comorbid mental disorders and substance use disorders show a higher psychopathological severity (Langås et al., 2011; Stahler et al., 2009; Szerman et al., 2012) and increased rates of risky behaviour, which can lead to infection with diseases such as HIV/AIDS and hepatitis C (Khalsa et al., 2008), psychosocial impairments and criminal behaviour (Greenberg and Rosenheck, 2014; Krausz et al., 2013). Taking into account the burden on health and legal systems, psychiatric comorbidity among subjects with substance use disorders leads to high costs for society (DeLorenze et al., 2014; Whiteford et al., 2013).

To address such a broad and complex subject, this report aims to review the theoretical background and historical development of the concept of psychiatric comorbidity in subjects with substance use disorders, and to provide an overview of its epidemiology and treatment in the European, primarily EU, context. The focus of this report is on illicit drugs and, therefore, alcohol, tobacco and prescription drugs fall outside its scope. Nevertheless, alcohol and tobacco are mentioned in the report when necessary.

Chapters 1 and 2 of this publication provide overviews in respect of more general aspects of this issue. Chapter 1 reviews the theoretical background of comorbidity in medicine in order to focus on the definition and diagnosis of comorbidity of substance use and mental disorders. Chapter 2 provides a comprehensive review of the main instruments available to assess the presence of psychiatric comorbidity among subjects with substance use disorders.

Chapter 3 describes the methodology used to review the epidemiological and treatment approaches in the European context. In Chapter 4, an overview of the epidemiological situation regarding psychiatric comorbidity in subjects with substance use disorders in the European countries and in different populations (general, clinical, non-clinical populations) is provided. In Chapter 5, we discuss specific clinical aspects of the more common combinations of comorbid mental disorders and substance use disorders and the main treatment recommendations provided by the available studies and guidelines. In Chapter 6, a review of the current treatment situation in Europe is presented. Chapter 7 presents the main conclusions and recommendations of this report.

1

CHAPTER 1

Comorbidity of substance use and mental disorders: theoretical background and relevance

The term 'comorbidity of substance use and mental disorders' refers to the co-occurrence of a substance use disorder and another mental disorder in the same individual. Other terms applied to these patients include 'mentally ill chemical abusers', 'chemically addicted mentally ill', 'co-occurring disorder', 'comorbid disorder' and 'dual diagnosis'. The EMCDDA has defined 'comorbidity', in the context of drug users, as a 'temporal coexistence of two or more psychiatric disorders as defined by the International Classification of Diseases, one of which is problematic substance use' (EMCDDA, 2004). The World Health Organization (WHO) defines 'dual diagnosis' as 'the co-occurrence in the same individual of a psychoactive substance use disorder and another psychiatric disorder' (WHO, 2010). Since 2012, the World Psychiatric Association (WPA) has had a new Section for this issue, and has chosen to use the term 'dual disorders/pathology' for this Section (WPA, 2014).

The current chapter is an overview of the historical development of the concept of comorbidity and, specifically, of the comorbidity of substance use and mental disorders.

Historical development of the concept of comorbidity of diseases

Since the term 'comorbidity' was introduced in medicine by Feinstein (1970) to denote those cases in which 'any distinct additional clinical entity that has existed or that may occur during the clinical course of a patient who has the index disease under study', the concept has become an issue of concern not only in clinical care, but also in epidemiology and health services planning and financing. Comorbidity may occur concurrently (disorders are present at the same time) or successively (at different times in an individual's life). In recent years, the use of other terms has been considered preferable

depending on the focus of the study in question and the management of comorbidity. Therefore, the term 'multimorbidity' is preferred when referring to the co-occurrence of multiple diseases in one individual. 'Morbidity burden' is preferred when referring to the overall impact of the different diseases in an individual, taking into account their severity. 'Patient's complexity' is used to refer to the overall impact of the different diseases in an individual in accordance with their severity and other health-related attributes (Valderas et al., 2009).

In psychiatry, 'dual diagnosis' would be a particular example of multimorbidity, whereby two different disorders coexist without any implicit ordering (i.e. mental illness and substance abuse). Overall, the coexistence of two or more clinical conditions in the same individual raises two major clinical questions: (1) is there an underlying common aetiological pathway?; and (2) what is the impact of this coexistence of clinical conditions on clinical care?

Pathways to comorbidity

There are three main ways in which different diseases may occur in the same individual: chance, selection bias or causal association.

Chance: this refers to comorbidity that occurs without causal linkage. Recognising comorbidity that occurs by chance is important to avoid false assumptions about causality.

Selection bias: this refers to the selection of individuals, groups or data that are not representative of the target population. It is sometimes referred to as the selection effect. The term was coined by Berkson (1946), who observed that disease clusters appeared more frequently in patients seeking care than in the general population.

Causal association: this can be described using four models of aetiological association that are not necessarily mutually exclusive (Rhee et al., 2004) and have yet to be applied extensively to the study of comorbidity:

Direct causation model: the presence of one disease is directly responsible for another.

Associated risk factors model: the risk factors for one disease are correlated with the risk factor for another disease, making the simultaneous occurrence of the diseases more likely.

Heterogeneity model: disease risk factors are not correlated, but each is capable of causing diseases associated with other risk factors.

Independence (distinct disease) model: the simultaneous presence of the diagnostic features of the co-occurring diseases actually corresponds to a third distinct disease.

Future research would benefit from using the explicit definitions for these constructs in conjunction with the current established disease classification systems, such as the *International Classification of Diseases (ICD)*, Tenth Edition (ICD-10) (WHO, 1992) or the *Diagnostic and Statistical Manual of Mental Disorders (DSM)*-Fifth Edition (DSM-5) (APA, 2013).

Comorbidity of substance use and mental disorders

Focusing on the case of comorbid mental and substance use disorders, different considerations must be taken into account.

Comorbidity in psychiatry

Use of the term 'psychiatric comorbidity' to indicate the concomitance of two or more mental disorders might be incorrect because in most cases it is unclear whether the concomitant diagnoses actually reflect the presence of distinct clinical entities or refer to multiple manifestations of a single clinical entity. This multiplicity of psychiatric diagnoses may be explained, on the one hand, as a product of some specific features of current diagnostic systems for mental disorders. In this sense, psychiatric diagnoses are syndromes rather than diseases that have known pathophysiology and valid and

reliable biological markers (e.g. biochemical tests). This lack of biological markers for psychiatric conditions has forced psychiatrists to develop operative diagnostic criteria, including the DSM (APA) and the ICD (WHO). Since the appearance of the DSM-III (APA, 1980) and subsequent DSM diagnostic criteria, mental disorders are diagnosed through a descriptive, categorical system that splits psychiatric behaviours and symptoms into numerous distinct diagnoses. Accordingly, the number of distinct psychiatric diagnoses described increased. On the other hand, to increase the validity and reliability of psychiatric diagnoses, different diagnostic interviews have been designed to assess psychiatric disorders in a systematic and standardised manner in accordance with main diagnostic criteria (such as those outline by the DSM and ICD) in order to eliminate biases. These interviews include the Schedule For Affective Disorders And Schizophrenia (SADS) (Endicott and Spitzer, 1978), the Structured Clinical Interview for DSM (SCID) (Spitzer et al., 1992) and the Composite International Diagnostic Interview (CIDI) (WHO, 1990). Their use reduces variability and improves diagnosis agreement and also helps to identify several clinical aspects that, in the past, tended to go unnoticed after the principal diagnosis had been made.

This approach to diagnostic psychiatric comorbidity, common for ICD and DSM systems, has several advantages from a clinical utility perspective. It maximises the communication of diagnostic information and helps to ensure that all clinically important aspects of a patient's presentation are addressed. This strategy encourages the clinician to record the maximum amount of diagnostic information, as a way of characterising the complexity of clinical presentations. Its main limitations are related to the fact that many clinicians and health information systems have a limited capacity for actually capturing this diagnostic information and often fail to characterise additional disorders that are present. Furthermore, recording five or six diagnoses on a patient's chart may obscure the intended focus of treatment (Dell'osso and Pini, 2012; Maj, 2005; Pincus et al., 2004).

Definitions related to substance use

Various terms are used by different organisations (e.g. the EMCDDA, WHO) and in disease classifications to describe the more problematic forms of drug use. These terms include high-risk drug use, harmful use, substance abuse, substance dependence and, recently, in DSM-5 (APA, 2013), substance use disorder to different severity degrees.

Differences in the definitions used are relevant not only from the epidemiological perspective but also in relation to the treatment and services needed (see the glossary).

Pharmacological effects of substances

Another important factor to take into account is that the different acute or chronic pharmacological effects of the different psychoactive substances can mimic the symptoms of other mental disorders, making it difficult to differentiate psychopathological symptoms, which represent an independent (primary) mental disorder, from symptoms of acute or chronic substance intoxication or withdrawal (e.g. insomnia may be interpreted as a symptom of cocaine use or a symptom of depression). This overlapping of symptoms of substance use or withdrawal with symptoms corresponding to different mental disorders is a relevant and confounding issue for the diagnostics of comorbidity.

These characteristics have been reflected in the evolution of diagnostic concepts relating to comorbidity.

Evolution of the diagnostic concepts of comorbidity of substance use and mental disorders

Historically, the approaches to the diagnosis of comorbid mental disorders among substance abuse patients evolved from the simpler Feighner criteria, which distinguished between 'primary' and 'secondary' disorders on the basis of age at onset of each disorder, with the disorder diagnosed at the earliest age being considered 'primary' (Feighner et al., 1972). Subsequently, the Research Diagnostic Criteria (RDC) (Spitzer et al., 1978), DSM-III (APA, 1980) and DSM-III-R (APA, 1987) used the concept of 'organic' versus 'non-organic' disorders. In these classification systems, subjects in whom organic factors may play a significant part in the development of the psychiatric disturbance were considered not to have an independent psychiatric disorder. However, specific criteria for distinguishing organic from non-organic disorders were not provided, leaving the differentiation process unclear. The lack of specific criteria for this decision left room for discrepant approaches, and even studies using structured diagnostic instruments showed poor reliability and validity for psychiatric diagnoses in substance abusers (Torrens et al., 2006).

Since then, in response to increasing recognition of the relevance of comorbid psychiatric disorders in drug users, both DSM-IV (APA, 1994) and ICD-10 (WHO, 1992) emphasised the need for the clarification of diagnoses of psychiatric disorders in drug users. The DSM-IV placed more emphasis on comorbidity, replacing the dichotomous terms 'organic' and 'non-organic' with three categories: 'primary' psychiatric disorders, 'substance-induced' disorders and 'expected effects' of the substances. 'Expected effects' refer to the expected drug-related intoxication and withdrawal symptoms that should not be diagnosed as symptoms of a psychiatric disorder. DSM-IV-Text Revision (APA, 2000) provides more specific guidelines for establishing this differentiation, which is maintained in DSM-5 (APA, 2013):

- A 'primary' disorder is diagnosed if symptoms are not due to the direct physiological effects of a substance. There are four conditions under which an episode that co-occurs with substance intoxication or withdrawal can be considered primary:
 1. when symptoms are substantially in excess of what would be expected given the type or amount of substance used or the duration of use;
 2. there is a history of non-substance-related episodes;
 3. the onset of symptoms precedes the onset of substance use; and
 4. symptoms persist for a substantial period of time (i.e. at least one month) after the cessation of intoxication or acute withdrawal.

If neither 'primary' nor 'substance-induced' criteria are met, then the syndrome is considered to represent intoxication or withdrawal effects of alcohol or drugs.

- A 'substance-induced' disorder is diagnosed when the symptom criteria for the disorder are fulfilled; a primary classification must be first ruled out, the episode must occur entirely during a period of heavy substance use or within the first four weeks after cessation of use; the substance used must be 'relevant' to the disorder (i.e. its effects can cause symptoms mimicking the disorder being assessed); and the symptoms must be greater than the expected effects of intoxication or withdrawal.
- The 'expected effects' are the predicted physiological effects of substance abuse and dependence. They are reflected in the substance-specific symptoms of intoxication and withdrawal for each main category of

substances. The expected effects can appear identical to the symptoms of primary mental disorders (e.g. insomnia, hallucinations).

The ICD-10 (WHO, 1992) provides specific criteria to differentiate between primary disorders and disorders resulting from psychoactive substance use, but only for psychotic disorders. In addition, the ICD-10 excludes psychotic episodes attributed to psychoactive substance use from a primary classification. However, it does not provide a separate psychoactive substance-related category for any other type of psychiatric disorder. By definition, an ICD-10 'organic mental disorder' excludes alcohol or other psychoactive substance-related disorders. ICD-10 organic mood disorder and organic delusional disorder cannot be used to diagnose episodes co-occurring with heavy psychoactive substance use. Furthermore, the DSM concept of symptoms that are greater than the expected effects of intoxication and withdrawal is not included in the ICD-10.

The evolution of the diagnostic criteria used in relation to comorbidity is also relevant to understanding the difficulties in the study of this issue and the controversial results from epidemiological studies.

Mechanisms of the comorbidity of substance use and mental disorders

Although convincing evidence supports a strong association between several mental disorders and substance use disorders, the nature of this relationship is complex and may vary depending on the particular mental disorder (e.g. depression, psychosis, post-traumatic stress disorder) and the substance in question (e.g. alcohol, cannabis, opioids, cocaine).

As mentioned previously, there are three main ways in which different diseases or disorders may occur in the same individual: chance, selection bias or causal association. Focusing on the comorbidity of substance use and mental disorders, we list below four non-exclusive aetiological and neurobiological hypotheses that could explain comorbidity.

The first hypothesis is that the combination of a substance use and another mental disorder may represent two or more independent conditions.

In this case, the combination may occur through chance alone (roughly, the prevalence of one disorder multiplied by the prevalence of the other) or as a consequence of

the same predisposing factors (e.g. stress, personality, childhood environment, genetic influences) that affect the risk for multiple conditions. That is, substance use disorders and other psychiatric disorders would represent different symptomatic expressions of similar pre-existing neurobiological abnormalities (Brady and Sinha, 2005).

Research in basic neuroscience has demonstrated the key roles of biological and genetic or epigenetic factors in an individual's vulnerability to these disorders. Genes, neural bases and environment are intimately interconnected. All psychoactive substances with abuse potential have a counterpart in, or correspond to, some endogenous system, such as the opioid system, the endocannabinoid system, the cholinergic/nicotinic system or the dopaminergic system. An inherited or acquired deficiency in these neurobiological systems and circuits may explain addictive behaviour and other psychiatric symptoms.

Addictive behaviours associated with other psychiatric disorders — psychobiological traits or states — are probably developmental disorders. These are disorders that begin very early in development, possibly through the interaction of neurobiological and environmental factors, and may present with different phenotypes, such as addiction-related or other psychiatric symptoms, at different stages of the lifespan. In this view, addiction (i.e. compulsive loss of control, at times uncontrollable craving, seeking and use despite devastating consequences) is a behavioural disorder (with various addictive objects, such as substances, gambling) occurring in a vulnerable phenotype, in which an intrinsic predisposed state or trait determines the neuroplasticity that is induced by psychoactive substances (Swendsen and Le Moal, 2011). Addiction is a multifaceted problem, and detailed information developed by different academic disciplines relating to the diverse approaches to this issue is provided in *Models of addiction* (EMCDDA, 2013b).

The second hypothesis is that the psychiatric disorder other than the substance use disorder is a risk factor for drug use and the development of a comorbid substance use disorder.

In this scenario, different situations can be considered. In the 'self-medication hypothesis' (Khantzian, 1985), the substance use disorder develops as a result of attempts by the patient to deal with problems associated with the mental disorder (e.g. social phobia, post-traumatic stress disorder, psychosis). In this case, the substance use disorder might become a long-term problem, or the excessive use of alcohol or an illicit drug

might abate when the pre-existing mental disorder is addressed appropriately (Bizzarri et al., 2009; Leeies et al., 2010; Smith and Randall, 2012).

However, in some psychiatric disorders it may be difficult to anticipate the negative consequences of drug use (e.g. mania, antisocial personality disorder). The psychiatric disorder could increase the risk of heavy and repetitive use of substances (e.g. cocaine), leading to the development of a substance use disorder that might continue even when the pre-existing psychiatric condition is appropriately treated or remits (Moeller et al., 2001).

The third hypothesis is that a substance use disorder could trigger the development of another psychiatric disorder in such a way that the psychiatric disorder then runs an independent course.

Drug use can function as a trigger for an underlying long-term disorder. This is probably the most important mechanism underlying the association between cannabis use and schizophrenia. It is well known that cannabis use in vulnerable adolescents can facilitate the development of a psychosis that runs as an independent illness (Radhakrishnan et al., 2014).

In other cases, repeated drug use leads, through neuroadaptation, to biological changes that have common elements with abnormalities that mediate certain psychiatric disorders (Bernacer et al., 2013).

Under the fourth and final hypothesis, a temporary psychiatric disorder is produced as a consequence of intoxication with, or withdrawal from, a specific type of substance; this is also known as substance-induced disorder.

Temporary psychiatric conditions (e.g. psychosis with features resembling schizophrenia) may be produced as a consequence of intoxication with specific types of substances (e.g. stimulants, such as amphetamines and cocaine) or withdrawal conditions (e.g. depressive syndromes associated with the cessation of stimulant use). The latest evidence of similar patterns of comorbidity and risk factors in individuals with substance-induced disorder and those with independent non-substance-induced psychiatric symptoms suggests that the two conditions may share underlying aetiological factors (Blanco et al., 2012). Furthermore, there are some studies showing that, in some cases, previous induced disorders have been diagnosed as independent disorders after a follow-up period. These findings suggest that substance-induced disorders may

be a transitory state prior to an independent disorder (Magidson et al., 2013; Martín-Santos et al., 2010).

Relevance of comorbidity of mental disorders in substance users

Apart from the difficulties in defining and diagnosing psychiatric comorbidity in those individuals with a substance use disorder, another crucial aspect is their impact, not only on clinical care but also on health service planning and financing.

Dual diagnosis has been associated with poor outcomes in affected subjects. In comparison with patients with a single disorder, dually diagnosed patients show a higher psychopathological severity, more emergency admissions (Booth et al., 2011; Curran et al., 2008; Langås et al., 2011; Martín-Santos et al., 2006; Schmoll et al., 2015), significantly increased rates of psychiatric hospitalisation (Lambert et al., 2003; Stahler et al., 2009) and a higher prevalence of suicide (Aharonovich et al., 2006; Conner, 2011; Marmorstein, 2011; Nordentoft et al., 2011; Szerman et al., 2012). In addition, comorbid drug users show increased rates of risky behaviours, which are linked to infections, such as HIV (human immunodeficiency virus) and hepatitis B and C viruses (Carey et al., 2001; Durvasula and Miller, 2014; Khalsa et al., 2008; King et al., 2000; Loftis et al., 2006; Rosenberg et al., 2001), as well as psychosocial impairments, such as higher unemployment and homelessness rates (Caton et al., 1994; Krausz et al., 2013; Vázquez et al., 1997), and considerable violent or criminal behaviour (Abram and Teplin, 1991; Cuffel et al., 1994; Greenberg and Rosenheck, 2014; Soyka, 2000). Taking into account the burden on health and legal systems, psychiatric comorbidity among drug users leads to high costs for society (DeLorenze et al., 2014; Whiteford et al., 2013). Clinical practice research has shown that comorbid disorders are reciprocally interactive and cyclical, and poor prognoses for both psychiatric and substance use disorders can be expected if treatment does not tackle both (Boden and Moos, 2009; Flynn and Brown, 2008; Magura et al., 2009). Treatment of dual diagnosis patients is set to be one of the biggest challenges in the drugs field in the coming years. The key questions will revolve around where, how and for how long to treat these patients (Torrens et al., 2012).

Summary

Comorbidity of substance use and mental disorders refers to the co-occurrence of a substance use disorder and another psychiatric disorder in the same individual.

The identification of psychiatric comorbidity in substance users is problematic, mainly because the acute or chronic effects of substance abuse can mimic the symptoms of many other mental disorders. This makes it difficult to differentiate psychiatric symptoms occurring as a result of acute or chronic substance use or withdrawal from those that represent an independent disorder. It is possible to distinguish between a 'primary' disorder, a 'substance-induced' disorder and the 'expected effects' of the substances, that is, the expected intoxication and withdrawal symptoms that should not be diagnosed as symptoms of a psychiatric disorder.

There are a number of non-exclusive aetiological and neurobiological hypotheses that could explain comorbidity: (a) the combination of a substance use disorder and another mental disorder may represent two or more independent conditions; (b) the psychiatric disorder may be a risk factor for drug use and the

development of a comorbid substance use disorder; (c) the substance use disorder could trigger the development of a psychiatric disorder in such a way that the additional disorder then runs an independent course; and (d) the temporary psychiatric disorder is produced as a consequence of intoxication with, or withdrawal from, a specific type of substance, also called a substance-induced disorder.

The clinical relevance of the comorbidity of substance use and mental disorders is related to its poor outcomes in affected subjects. In comparison with individuals with a single disorder, patients with comorbid mental and substance use disorders show a higher psychopathological severity, with more hospitalisations, an increased suicide risk, and an increased rate of HIV and hepatitis C virus infection, as well as psychosocial impairments, including criminal behaviours. Taking into account the burden on health, social and legal systems, the comorbidity of substance use and mental disorders leads to high costs for society.

Clinical practice research has shown that comorbid disorders are reciprocally interactive and cyclical, and poor prognoses for both comorbid disorders are expected if treatment does not tackle each one.

CHAPTER 2

Assessment of psychiatric comorbidity in drug users

As mentioned in Chapter 1, the clinical diagnosis of comorbid mental disorders in subjects with a substance use disorder involves certain difficulties. Great importance is given to distinguishing between the expected effects of intoxication with or withdrawal from substances, independent disorders and substance-induced disorders, as they may have different clinical courses and treatment outcomes (Torrens et al., 2006).

There are two main difficulties in establishing an accurate diagnosis in the context of substance abuse. First, acute or chronic effects of substance use can mimic symptoms of other mental disorders, which makes it difficult to differentiate between psychiatric symptoms that represent an independent (primary) disorder and symptoms of acute or chronic substance intoxication or withdrawal.

Secondly, psychiatric conditions are syndromes rather than diseases (which have known physiopathologies and valid and reliable biological markers, e.g. biochemical tests). The lack of biological markers for psychiatric conditions has forced mental health professionals to develop operative diagnostic criteria, including the DSM (APA) and the ICD (WHO).

In addition, to establish an accurate diagnosis, a complete substance use history should be obtained, taking account of the use of nicotine, alcohol, benzodiazepines, cannabis, opioids, stimulants and any other possible psychoactive substance. Moreover, urine analysis and blood tests should be performed. To establish how a patient's substance use and psychiatric disorder are linked, the age at onset of their disorders, family history and the effect of previous treatments for comorbid psychiatric disorders should be determined.

Furthermore, to increase the validity and reliability of psychiatric diagnosis, different diagnostic interviews have been designed to assess psychiatric disorders in a systematic and standardised manner in accordance with the main diagnostic criteria (DSM, ICD) in order to eliminate biases. Their use is intended to reduce variability and improve the diagnosis agreement. The key

points necessary to achieve these objectives are: (1) the specific language of the clinical questions; (2) the sequence of the questions; and (3) the assessment of responses. Additionally, standardised diagnostic interviews systematically judge the relevant symptoms, thereby reducing the likelihood of misdiagnoses and missed diagnoses.

There are multiple instruments designed for assessing problematic alcohol and substance use, including the Alcohol, Smoking and Substance Involvement Screening Test (ASSIST) (WHO, 2002); the Alcohol Use Disorders Identification Test (AUDIT) (Philpot et al., 2003); the Drug Use Disorders Identification Test (Berman et al., 2005); and the CRAFFT Screening Test for adolescents using alcohol and other drugs (Knight et al., 2002), or for assessing specific drug disorders, such as the Cannabis Use Disorders Identification Test (Adamson and Sellman, 2003) or the Cannabis Abuse Screening Test (Cuenca-Royo et al., 2012; Legleye et al., 2007). A detailed description of these instruments is outside the scope of this report. In this chapter, we will focus on the main instruments available to assess the comorbidity of other mental disorders among subjects with substance use disorders.

Instruments to assess the occurrence of comorbid mental disorders among substance users

A number of instruments are available to assess the occurrence of comorbid mental disorders among substance users. In general, it is possible to distinguish between screening or diagnostic instruments. The choice of instrument will depend on the context (clinical, epidemiological, research), the assessment objectives (single or multiple diagnosis), the time available to conduct the assessment and the expertise of staff.

On the one hand, screening instruments could be administered by lay interviewers after a short training

period. On the other hand, a deeper knowledge of psychopathology is needed to administer diagnostic instruments and, therefore, these instruments are designed to be used by expert professionals.

Here, an overview is provided of the main screening and diagnostic instruments available to assess comorbidity of mental disorders in subjects with substance use disorders used in published studies in English found in PubMed.

Screening instruments for comorbid mental and substance use disorders

Screening instruments are tools used to determine whether a patient does or does not warrant further attention with regard to a particular disorder or symptom. Screening for mental disorders in substance-user populations may provide an early indication of comorbidity, which may lead to a more specific treatment that can make a positive difference to the prognosis for both disorders.

General Health Questionnaire-28

The General Health Questionnaire-28 (GHQ-28) (Goldberg, 1978, 1986) is a self-report questionnaire comprising 28 items and taking approximately 5 minutes to complete, which is used for the detection of psychiatric distress in relation to general medical illness. Respondents indicate if their current 'state' differs from their usual state, which enables an assessment of changes in characteristics other than lifelong personality characteristics. It was designed to assess four aspects of distress: depression, anxiety, social impairment and hypochondriasis.

Symptom Checklist-90-Revised

The Symptom Checklist-90-Revised (SCL-90-R) (Derogatis et al., 1973) is a brief self-report questionnaire designed to evaluate a broad range of psychological problems and symptoms of psychopathology. It consists of 90 items and takes approximately 30 minutes to complete. It assesses primary symptom dimensions, such as somatisation, obsessions and compulsions, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation and psychoticism, and has an extra category of 'additional items' which helps clinicians assess other symptoms. Several studies have shown high sensitivity and moderate specificity for the SCL-90-R when used as

a screening instrument for mental disorders in substance use disorder patients (Benjamin et al., 2006; Haver, 1997). It also has two briefer versions, known as the Brief Symptom Inventory, with 53 and 18 items, respectively (Derogatis and Melisaratos, 1983).

Symptom-Driven Diagnostic System for Primary Care

The Symptom-Driven Diagnostic System for Primary Care (SDDS-PC) DSM-IV (Broadhead et al., 1995; Weissman et al., 1995) includes three related instruments: (1) a brief patient questionnaire (16 items) comprising screens for major depressive disorders, generalised anxiety disorder, panic disorder, obsessive-compulsive disorder, alcohol and drug dependence, and suicidal ideation or attempts; (2) nurse-administered diagnostic interviews specific to the screened disorders; and (3) a one-page computer-generated form that summarises the diagnostic interview. Minor or subsyndromal conditions are also addressed at the physician's discretion. It takes approximately 30 minutes to complete.

Patient Health Questionnaire

The Patient Health Questionnaire (PHQ) (Spitzer et al., 1999) is a self-report measure based on the Primary Care Evaluation of Mental Disorders and designed to reduce administration time while still providing valid information. It assesses eight disorders, includes an alcohol consumption audit, and also provides a possible severity of depression. In substance users, it has been validated only for depression (Delgado et al., 2011).

Psychiatric Diagnostic Screening Questionnaire

The Psychiatric Diagnostic Screening Questionnaire (PDSQ) (Zimmerman and Mattia, 2001) is a self-report screening instrument assessing 13 common DSM-IV disorders including major depression, bipolar disorder, post-traumatic stress disorder and psychosis, as well as alcohol and drug use disorders. Studies on characteristics of the PDSQ have indicated good test-retest reliability and high sensitivity, specificity and predictive value compared with structured clinical interviews (Pérez Gálvez et al., 2010; Zimmerman and Chelminski, 2006; Zimmerman et al., 2004). Considering that it is a self-report questionnaire with 125 items (requiring approximately 20 minutes to complete) and that good results obtained with the scale have been reported in several studies, the PDSQ would appear to

be a good instrument for use in mental health, substance abuse or primary healthcare settings.

Mental Health Screening Form

The Mental Health Screening Form (MHSF)-III (Carroll and McGinley, 2001) is a semi-structured interview developed to identify co-occurring mental health problems in individuals entering substance use treatment. It requires minimal training to use and most clients complete it in 15 minutes (18 items to be answered 'yes' or 'no'). The results of different investigations (Ruiz et al., 2009; Sacks et al., 2007) support the use of this instrument in substance use disorder populations. The first four questions on the MHSF-III are not specific to any particular diagnosis; however, questions 5–17 reflect symptoms associated with the following categories: schizophrenia; depressive disorders; post-traumatic stress disorder; phobias; intermittent explosive disorder; delusional disorder; sexual and gender identity disorders; eating disorders (anorexia, bulimia); manic episodes; panic disorder; obsessive–compulsive disorder; pathological gambling; learning disorder; and mental retardation.

Modified Mini Screen

The Modified Mini Screen (MMS) (OASAS, 2005) is a 22-item questionnaire that is administered by a clinician in approximately 15 minutes. It is designed to identify psychiatric disturbances in the domains of mood disorders, anxiety disorders and psychotic disorders that may need further assessment. The questions are based on gateway questions and threshold criteria found in the DSM-IV, the Structured Clinical Interview for Diagnosis (Spitzer et al., 1992) and the Mini International Neuropsychiatric Interview (MINI) (Lecrubier et al., 1997). It has been adapted for use in substance abuse settings (Alexander et al., 2008).

Co-occurring Disorders Screening Instruments

The Co-occurring Disorders Screening Instrument for Mental Disorders (CODSI-MD) (Sacks et al., 2007) is a six-item instrument and the Co-occurring Disorders Screening Instrument for Severe Mental Disorders (CODSI-SMD) (Sacks et al., 2007) is a three-item instrument, both of which are derived from the three standard mental health screeners. There is sufficient evidence that both are capable of determining the presence of any mental disorder, and the particular strength of the three-item CODSI-SMD is determining

the presence of a severe mental disorder in the prison population.

Measurement in Addiction for Triage and Evaluation

The Measurement in Addiction for Triage and Evaluation (MATE) (Schippers et al., 2010) includes 10 modules assessing different areas of functioning with combined resources such as self-rating scales and interview schedules. The MATE uses well-known instruments such as the Maudsley Addiction Profile-Health Symptoms Scale, the Standardised Assessment of Personality Abbreviated Scale, the Depression Anxiety Distress Scales (De Beurs et al., 2001) or the substance use module of the Composite International Diagnostic Interview version 2.1 to screen different symptoms/disorders. It does not provide diagnoses of psychiatric disorders other than substance use disorders; rather, it identifies those who might need a diagnostic evaluation. If all modules and questionnaires are completed, the total administration time can reach 1 hour.

Dual Diagnosis Screening Instrument

The Dual Diagnosis Screening Instrument (DDSI) (Mestre-Pintó et al., 2014) is a screening instrument originally designed for the screening of psychiatric comorbidity among substance users by lay interviewers. The DDSI has been shown to be a valid screening instrument for the detection of the most frequent and severe psychiatric disorders among substance users, namely depression, mania, psychosis, panic, social phobia, specific phobia, attention deficit and hyperactivity disorder and post-traumatic stress disorder. Furthermore, the DDSI has demonstrated good versatility, because it can be administered in a wide range of settings (research, inpatient units, outpatients centres) to subjects who are using different kinds of substances (including opioids, alcohol, cocaine, amphetamines, cannabis and MDMA). Its psychometric properties (sensitivity higher than 85 % in all the diagnoses and specificity higher than 80 %), together with the ease of training (1.5 hours for lay administrators) and brevity of administration (20–25 minutes at most for 64 items) make the DDSI a suitable instrument for dual diagnosis screening both in specialised care settings and in community health facilities.

TABLE 2.1

Screening instruments for comorbid mental and substance use disorders

Name	Disorders assessed	Criteria	Administration	Population	Administration Time (minutes)
GHQ-28 (Goldberg, 1978)	Four aspects of distress	Not disorder-specific	Self-administered	General and drug users	15
SCL-90 (Derogatis et al. 1973)	Primary symptoms (10 dimensions)	Not disorder-specific	Self-administered	General and drug users	15–20
SDDS-PC (Broadhead et al., 1995)	Five disorders	DSM	Self-administered and trained professional	General	35
PHQ (Spitzer et al., 1999)	Eight disorders	DSM	Self-administered	General	15–20
PDSQ (Zimmerman and Mattia, 2001)	Thirteen disorders	DSM	Self-administered	General and drug users	15
MHSF-III (Carroll and McGinley, 2001)	General symptoms	Not disorder-specific	Trained lay interviewer	Drug users	15
MMS (OASAS, 2005)	General symptoms	Not disorder-specific	Trained lay interviewer	Drug users	15
CODSI-MD (Sacks et al., 2007)	General symptoms	Not disorder-specific	Trained lay interviewer	Drug users	<5
CODSI-SMD (Sacks et al., 2007)	General symptoms	Not disorder-specific	Trained lay interviewer	Drug users	<5
MATE (Schippers et al., 2010)	Substance use disorder and general symptoms	DSM-SUD	Trained lay interviewer	Drug users	40–80
DDSI (Mestre-Pintó et al., 2014)	Eleven disorders	DSM	Trained lay interviewer	Drug users	20

Diagnostic instruments for comorbid mental and substance use disorders

There are few diagnostic interviews available to facilitate a valid and reliable psychiatric diagnosis in accordance with operative criteria. Differences among these types of interviews are related to the flexibility of questioning allowed to the interviewer. In a structured interview, all questions are standardised and must be asked verbatim, using optional probes to clarify ambiguities in how responses meet criteria. This ensures a high level of standardisation, even though the adherence to formulated questions cannot cover all eventualities. These interviews are especially useful for epidemiological studies, such as national surveys, because they do not need any interviewer interpretation. However, as there are questions that often involve emotional experiences, respondents' doubts can give rise to coding problems, and interviewers need appropriate training and access to glossaries. In a semi-structured interview, expert clinicians are also allowed to use unstructured questions to assist them in rating responses when diagnostic issues remain unresolved despite the optional probes. This can optimise criterion variance, occasionally at the expense of information variance. Semi-structured interviews are more suitable for clinical settings, as they allow interpretation by clinicians or interviewers, based on standardised definitions and codings.

Structured and semi-structured clinical interviews are constantly evolving. This is due to the minor or major changes necessary to adopt new features of the classification systems (DSM and ICD) or to incorporate modifications suggested by the different methodological procedures applied to validate them.

Diagnostic Interview Schedule

The Diagnostic Interview Schedule (DIS) (Robins et al., 1982) is a highly structured psychiatric interview developed at the University of Washington (begun in 1978) that may be administered by both professional and trained lay interviewers in the Epidemiologic Catchment Area programme. It was originally created based on the DSM, the Feighner guidelines and the RDC. Its most recent version is the DIS-IV, revised for DSM-IV criteria, and it has a computerised version (C-DIS-IV) (Robins et al., 2000). All versions attempt to mimic a clinical interview, thereby eliminating the need for clinical judgement by using questions to determine whether or not psychiatric symptoms are clinically significant and whether or not they are explained by medical conditions or substance use. The DIS-IV assesses a lifetime history of symptoms and conditions, from childhood to the present. The interview takes between 90 and 120 minutes to complete in the original paper format and approximately 75 minutes in its computerised version. All questions are worded to promote closed-ended answers,

with responses coded 'yes' or 'no'. The DIS provides diagnostic information about somatisation/pain, specific phobia, social phobia, agoraphobia, panic disorders, generalised anxiety disorders, post-traumatic stress disorder, depression, dysthymia disorder, mania, hypomania disorders, schizophrenia, schizophreniform, schizoaffective disorders, obsessive–compulsive disorder, anorexia nervosa, bulimia disorders, attention deficit and hyperactivity disorder, separation anxiety disorder, oppositional disorder, conduct disorder, antisocial personality disorder, nicotine dependence, drug use and dependence (alcohol, amphetamines, cannabis, cocaine, hallucinogens, opioids, phencyclidine, sedatives, inhalants, 'recreational drugs'), pathological gambling and dementia. For more information about the interview, visit its official web page (<http://epidemiology.phhp.ufl.edu/assessments/c-dis-iv/>).

Results on psychometric properties of the DIS-IV mostly derive from studies of earlier versions of the DIS (Rogers, 2001). The DIS has also been widely used in research on substance use disorders in North America, Europe and Asia (Helzer and Canino, 1992).

Schedules for Clinical Assessment in Neuropsychiatry

The Schedules for Clinical Assessment in Neuropsychiatry (SCAN) (Wing et al., 1990) are a set of tools integrated into a semi-structured psychiatric interview that aims to assess, measure and classify the psychopathology and behaviour associated with the major psychiatric disorders. It was later developed by WHO for cross-cultural studies and is available in 13 languages (Janca et al., 1994). The core component of SCAN version 2.1 is the 10th version of the Patient State Examination (PSE-10) (Wing, 1996). The PSE, originally developed by Wing and colleagues, has evolved over the past four decades, presenting changes in both structure and ratings. The PSE-10 is a semi-structured clinical examination and has two differentiated parts. Part 1 covers somatoform, dissociative, anxiety, depressive and bipolar disorders and problems associated with eating, alcohol and other substance use, as well as covering a limited number of physical features. Part 2 covers psychotic and cognitive disorders and observed abnormalities of speech, affect and behaviour.

The PSE covers the 'current state', that is, the month prior to the administration, and the 'prior over life'. The SCAN instrument has three other components: the glossary (detailed differential definitions), the Item Group Checklist (to rate information from sources other than the respondent) and the Clinical History Schedule.

The SCAN requires extensive training of the interviewer prior to administration; it can be used by paraprofessionals with direct supervision but it is meant to be used by mental health professionals. The interviewer must be familiar with the terms of the glossary in order to be able to interview the subject in detail, to seek responses in accordance with the glossary and to decide whether or not a symptom is present, and, if so, to assess its severity. After the subject's description of the symptom, the interviewer marks this in accordance with the glossary definition and encodes a scale attribute for the item. The administration time ranges from 1 to 2 hours, and is strongly influenced by the absence or presence of psychopathology. The SCAN has been translated into many languages following WHO protocol (for further details, visit <http://www.whoscan.org/>).

Several studies have used the SCAN in multiple substance-user samples (Arendt et al., 2007; Baldacchino, 2007; Nelson et al., 1999). No data about validity and reliability of diagnosis obtained through the SCAN in drug using populations are available.

Diagnostic Interview for Genetic Studies

The Diagnostic Interview for Genetic Studies (DIGS) (Nurnberger et al., 1994) is a specific clinical interview for genetic studies developed by the National Institute of Mental Health Genetics Initiative for the assessment of major mood and psychotic disorders and their spectrum conditions. It has polydiagnostic capacity and enables a detailed assessment of the course of the illness, the chronology of the affective and psychotic disorders and comorbidity, an additional description of symptoms and an algorithmic scoring capability. It is a semi-structured interview designed to be used by trained interviewers with experience in interviewing and making judgements about manifest psychopathology. To extract the best information possible, interviewers are allowed to modify questions, but, whenever possible, questions should be read exactly as written. It is composed of 12 sections, including an introduction to the Mini Mental State Examination, demographics and a medical history, somatisation, overview, mood disorders, substance abuse disorders, psychosis, comorbidity, suicidal behaviour, anxiety disorders, eating disorders and sociopathy. The average administration time is 2–3 hours depending on the psychopathology of the interviewee. Reliabilities were excellent (0.73–0.95) (Nurnberger et al., 1994), except for schizoaffective disorder. The DIGS may be useful as part of archive data gathering for genetic studies of major affective disorders, schizophrenia and related conditions.

Mini-International Neuropsychiatric Interview

The Mini-International Neuropsychiatric Interview (MINI) is a short, structured, clinical Axis-I interview that provides standardised data to clinicians in mental health and medical settings with a rapid and accurate evaluation of both DSM-IV and ICD-10 criteria (Lecrubier et al., 1997; Sheehan et al., 1998). It was intended to be used by trained paraprofessionals in clinical psychiatry and research settings, after an extensive training process. It focuses on current disorders rather than lifetime disorders. There are four versions of the MINI; the original MINI is useful in clinical settings and research for its brevity (15–20 minutes for administration). It provides 17 Axis-I disorders (major depressive disorder, dysthymia disorder, mania, panic disorder, agoraphobia, social phobia, specific phobia, obsessive–compulsive disorder, generalised anxiety disorder, alcohol abuse and dependence, drug use or dependence, psychotic disorders, anorexia nervosa, bulimia and post-traumatic stress disorder), a suicidality module and one Axis-II disorder (antisocial personality disorder). The MINI-Plus is an extended version (45–60 minutes), which includes 23 disorders that can be assessed in more detail and is intended for research purposes. The MINI-Screen is a short version (5 minutes) designed for primary care settings. Finally, the MINI-Kid assesses 27 diagnoses, framing the questions in a language more suitable for children and adolescents. The administration time is approximately 40 minutes.

The MINI has been extensively used in substance-user populations (Leray et al., 2011; Lukasiewicz et al., 2009), although neither validity nor reliability data are available for these populations.

Composite International Diagnostic Interview

The Composite International Diagnostic Interview (CIDI) version 1.0 was developed under the auspices of WHO (1990). It was an expansion of the DIS-III, with questions from the PSE added to generate diagnoses based on ICD criteria as well as DSM criteria (Robins et al., 1988). The latest version, the CIDI 3.0, is a fully structured interview designed to be used by lay interviewers after a training course. The interviewers should read questions only as they are written, without any interpretation. The first section is an introductory screening and lifetime review section to determine which sections need to be assessed. There are 22 diagnostic sections that assess mood disorders (major depression and mania), anxiety disorders (panic disorder, specific phobia, agoraphobia, generalised anxiety disorder, post-traumatic stress disorder, obsessive–compulsive disorder and social

phobia), substance use disorders (alcohol abuse and dependence, nicotine and other drugs), childhood disorders (attention deficit and hyperactivity disorder, oppositional defiant disorder, conduct disorder, panic disorder and separation anxiety disorder) and other disorders (intermittent explosive disorder, eating disorders, premenstrual disorder, pathological gambling, neurasthenia, personality disorders and psychotic disorders). Four additional sections assess several types of functioning and physical comorbidities. Two additional sections evaluate the treatment of mental disorders, four assess risk factors, six assess sociodemographic characteristics, and the two final sections are methodological. The first of these methodological sections includes rules for determining which respondents to select for Part 2 of the interview and which respondents should finish the interview after Part 1. The second methodological section consists of interviewer observations that are recorded once the interview has ended. The entire World Mental Health-CIDI takes an average of 2 hours to administer in most general population subjects. Complete reviews of the validations conducted have been described by Rogers (2001).

Structured Clinical Interview for DSM-IV Disorders

The Structured Clinical Interview for DSM-IV disorders (SCID) has undergone a number of changes since its initial conceptualisation in 1983. There are now two distinct clinical interviews, one for the assessment of Axis-I disorders, SCID-I (Spitzer et al., 1992), and one for Axis-II disorders, SCID-II (First, 1997). Both require a trained mental health professional rater for their use. The SCID can be used with adults who do not have severe cognitive impairment, agitation or severe psychotic symptoms.

Structured Clinical Interview for DSM-IV Disorders-I

The SCID-I is probably the most commonly used interview in general psychiatry; it was designed for use with subjects already identified as psychiatric patients and was initially modelled on the standard clinical interview practiced by many mental health professionals. The SCID-I is a semi-structured interview that includes two separate books: the administration booklet, which contains the interview questions, and the abridged DSM-IV diagnostic criteria. Experienced clinicians are allowed to customise questions to fit the patient's understanding. The ratings on SCID-I are based on both the patient's answers and the expertise of the rater (who

may ask additional questions to clarify ambiguities or to assess the seriousness of symptoms). The administration time is between 1 and 2 hours, depending on the presence or absence of pathology.

SCID-CV (clinical version), the most commonly used version, comprises Module A: mood episodes; Module B: psychotic symptoms; Module C: psychotic disorders; Module D: mood disorders; Module E: substance use disorders; and Module F: anxiety and other disorders. It provides substance-induced and primary diagnoses but without specific guidelines for the psychopathological criteria proposed by the DSM-IV.

The validity of SCID-I has been assessed using approximations of the LEAD (Longitudinal, Expert, All Data) procedure in substance users, showing poor validity results for diagnosing primary major depression or substance-induced psychotic disorders in substance-abusing patients (Torrens et al., 2004).

Structured Clinical Interview for DSM-IV Disorders-II

The SCID-II (First, 1997) is a semi-structured Axis-II interview, which was constructed as a complementary measure to the SCID-I in 1987; it has incorporated changes over the years in order to adopt the evolving DSM criteria. The most relevant characteristics are its brevity (30–45 minutes), its ease of administration and the low level of training required for professionals. All versions of the interview have been used in many studies with substance users (Ball et al., 2001; Casadio et al., 2014; Spalletta et al., 2007). Borderline personality disorders have shown poor validity results in substance-abusing patients (Torrens et al., 2004).

Psychiatric Research Interview for Substance and Mental Disorders

The Psychiatric Research Interview for Substance and Mental Disorders (PRISM) (Hasin et al., 1996) is a semi-structured interview developed in response to the lack of a diagnostic interview suitable for comorbidity research. Three important characteristics of the PRISM, which are specific to comorbidity, are: (1) the addition of specific rating guidelines throughout the interview, including frequency and duration requirements for symptoms, explicit exclusion criteria and decision rules for frequent sources of uncertainty; (2) positioning of the alcohol and drug sections of the PRISM near the beginning of the interview, before the mental disorder sections, so that the history of alcohol and drug use is

available at the beginning of the assessment of mental disorders; and (3) more structured alcohol and drug histories to provide a context for assessing comorbid psychiatric disorders. The first version of PRISM, based on DSM-III-R criteria, showed good to excellent reliability for many diagnoses, including affective disorders, substance use disorders, eating disorders, some anxiety disorders and psychotic symptoms (Hasin et al., 1996). To address the changes in DSM-IV, the PRISM has been updated and revised in order to provide diagnoses of primary and substance-induced disorders and to include the expected effects of intoxication or withdrawal. In addition, the revised version of the PRISM provides a method for operationalising the term 'in excess of' regarding the expected effects of a substance in chronic substance abusers. The PRISM interview has demonstrated good psychometric properties in terms of test–retest reliability (Hasin et al., 2006), inter-rater reliability (Morgello et al., 2006) and validity (Ramos-Quiroga et al., 2012; Torrens et al., 2004) to diagnose psychiatric disorders among substance users.

The PRISM includes the following disorders: (1) substance use disorders, including substance abuse and dependence for alcohol, cannabis, hallucinogens, licit and illicit opioids and stimulants; (2) primary affective disorders, including major depression, manic episodes (and bipolar I disorder), psychotic mood disorder, hypomanic episode (and bipolar II disorder), dysthymia and cyclothymic disorder; (3) primary anxiety disorders, including panic, simple phobia, social phobia, agoraphobia, obsessive–compulsive disorder, generalised anxiety disorder and post-traumatic stress disorder; (4) primary psychotic disorders, including schizophrenia, schizoaffective disorder, schizophreniform disorder, delusional disorder and psychotic disorders not otherwise specified; (5) eating disorders, including anorexia, bulimia and binge-eating disorder; (6) personality disorders, including antisocial and borderline personality disorders; attention deficit and hyperactivity disorder; and (7) substance-induced disorders, including major depression, mania, dysthymia, psychosis, panic disorder and generalised anxiety disorder. The average time of administration is approximately 1–3 hours depending on the patient's clinical history. At the time of writing, a new version adapted to DSM-5 criteria is about to be published.

Alcohol Use Disorder and Associated Disabilities Interview Schedule

The Alcohol Use Disorder and Associated Disabilities Interview Schedule (AUDADIS)-IV (Grant et al., 1995, 2003) is a fully structured diagnostic interview designed

to be used in the general population, but it can also be used for research in community samples of individuals with alcohol and drug use diagnoses (Hasin et al., 1997). It can be administered by either lay interviewers or clinicians after a training period. Administration of the AUDADIS-IV takes between 1 and 2 hours. It contains modules to measure alcohol, tobacco and drug use disorders, major mood, anxiety and personality disorders and family histories of alcohol and drug use, major depression and antisocial personality disorder in accordance with DSM-IV criteria. Diagnosis time frames are the past 12 months (current) and prior to the past 12 months (past). The AUDADIS was the first instrument to include a range of measures designed specifically to characterise psychiatric co-morbidity among substance users in general population studies. The instrument includes (1) measures of date of onset and remission for each disorder rather than the dates of onset and the first and last symptoms of the disorder; (2) adequate measures of duration criteria (i.e. the repetitiveness of symptoms necessary to assess their clinical significance); (3) provisions for deriving hierarchical and non-hierarchical diagnoses; (4) comorbidity modules of related disorders; (5) measures of self-medication associated with anxiety and mood disorders; (6) measures of true mood and anxiety disorders and those mood and anxiety disorders that are either substance-induced or attributable to a general medical condition; and (7) detailed questions on the frequency, quantity and patterning of alcohol, tobacco and drug use (Grant et al., 2003).

The AUDADIS showed high reliability in a test–retest study in clinical settings in which comorbidity was expected to be high (Hasin et al., 1997). Its test–retest reliabilities for alcohol and drug consumption, abuse and dependence, as well as those for other modules, were good to excellent (Grant et al., 1995, 2003).

Semi-Structured Assessment for Drug Dependence and Alcoholism

The Semi-Structured Assessment for Drug Dependence and Alcoholism (SSADDA) (Pierucci-Lagha et al., 2005) is derived from the Semi-Structured Assessment for the Genetics of Alcoholism and was developed for use in studies of the genetic influences on cocaine and opioid dependence. The SSADDA provides more detailed coverage of specific drug use disorders, particularly cocaine and opioid dependence, than existing psychiatric diagnostic instruments, and it has a wide coverage of all the major implications (physical, psychological, social and psychiatric) of substance use disorders in addition to conduct disorder, antisocial personality disorder, major depressive disorder, bipolar I disorder, attention deficit hyperactivity disorder, post-traumatic stress disorder and pathological gambling. A salient feature of the SSADDA is its inclusion of questions about the onset and recency of individual alcohol and drug symptoms, which permits a temporal assessment of symptom clusters. Information about the timing of symptoms is particularly helpful in

TABLE 2.2
Diagnostic interviews for comorbid mental and substance use disorders

Name	Criteria	Administration	Interviewer's experience	Population/use	Administration time
DIS (Helzer, 1981)	DSM-IV	Structured	Training	Drug users and general population/clinical studies Epidemiological studies	1–2 hours
SCAN (Janca et al., 1994)	ICD-10 DSM-IV	Semi-structured	Training and clinical experience	General population/clinical studies	1–3 hours
DIGS (Nurnberger et al., 1994)	ICD-10 DSM-IV	Semi-structured	Training and clinical experience	Drug users/clinical studies	2–3 hours
MINI (Lecrubier et al., 1997)	ICD-10 DSM-IV	Structured	Training	Drug users and general population/epidemiological and clinical studies	20–30 minutes
CIDI (WHO, 1998)	ICD-10 DSM-IV	Structured	Training	Drug users and general population/epidemiological and clinical studies	1–3 hours
SCID-IV (First et al., 1997)	DSM-IV	Semi-structured	Training and clinical experience	Drug users and general population/clinical studies	1–2 hours
PRISM-IV (Hasin et al., 2001)	DSM-IV	Semi-structured	Training and clinical experience	Drug users/clinical studies	1–3 hours
AUDADIS (Grant et al., 2001)	DSM-IV	Structured	Training	Drug users/epidemiological studies	1–2 hours
SSADDA (Pierucci-Lagha et al., 2005)	DSM-IV	Semi-structured	Training and clinical experience	Drug users/clinical studies	1–3 hours

distinguishing comorbid disorders from intoxication or withdrawal effects.

The reliability of individual dependence criteria in the SSADDA has been tested to determine the extent to which independent interviewers arrive at the same diagnostic conclusions. Overall, the inter-rater reliability estimates were excellent for individual DSM-IV criteria for nicotine and opioid dependence, good for alcohol and cocaine dependence, and fair for dependence on cannabis, sedatives and stimulants (Pierucci-Lagha et al., 2007).

Summary

A number of instruments are available to assess the occurrence of comorbid mental disorders among substance users. The main distinction is between screening and diagnostic instruments. The choice of instrument will depend on the context (clinical, epidemiological, research), the assessment objectives (single or multiple diagnosis), the time available to conduct the assessment and the expertise of staff. Standard screening instruments for substance use disorders and for mental disorders should be used routinely in situations where available staff time or the lack of expertise excludes the universal application of more extended assessments. Without this routine screening, cases of psychiatric comorbidity will be missed. Procedures also need to be in place to alert staff to conduct additional assessments for comorbidity in positively screened cases.

CHAPTER 3

Methods

Following the overviews of the theoretical and historical definitions and diagnoses of comorbidity of substance use and mental disorders (Chapter 1) and the available instruments to assess the presence of psychiatric comorbidity among these patients (Chapter 2), in this chapter we describe the methods used to review the epidemiological and treatment approaches, above all in terms of services, in the European context. To conduct such a review, three different strategies, listed below, were implemented.

The first strategy involved conducting an exhaustive bibliography review using Medline, a well-known and reliable database, to search for relevant studies on the different aspects of comorbidity. The literature search took place in August 2013 and included key concepts such as 'comorbidity', 'dual diagnosis', 'treatment', 'epidemiology', 'health services' and 'diagnosis', which were combined to cover a wide range of the published sources of information.

References included in the studies identified by the Medline search were also checked, in order to be as sensitive as possible and not to miss relevant publications in the area. All the references were compiled and managed using EndNote bibliography software.

The selection of publications was a two-stage process. After the indicated search, 3 024 publications were identified. All of them were abstract reviewed; those publications that did not meet the necessary content criteria were excluded. The full texts of publications written in English, French, Italian and Spanish were reviewed if they were considered relevant for the purpose of the study. The abstracts only of studies published in other languages were reviewed, if available.

Once the relevant publications had been classified in accordance with the previously defined guidelines, two

senior researchers structured the relevant fields again based on the studies' content and taking into account the range of evidence. Finally, a review of the main guidelines in the field was conducted.

The second strategy complemented the literature search by carrying out a complete review of the Réseau Européen d'Information sur les Drogues et les Toxicomanies (Reitox) national reports. The core task of Reitox is collecting and reporting consistent, harmonised and standardised information on drugs and drug addiction across Europe. Each year Reitox national focal points submit a detailed report on the state of the drugs problem in their country to the EMCDDA. For the present search of information, an in-depth analysis of the latest Reitox report (or the report with the most relevant data) from each country was conducted, paying special attention to the information on comorbidity prevalence, health system networks for drug-related problems and mental health care. To acquire the most recent relevant information on the 30 countries affiliated to the Reitox network, it was necessary to extract data from 35 national reports.

The third strategy was to contact key informants in the field of addiction and to invite them to participate in the study. These professionals were asked to:

- give their permission to be part of the directory of experts or 'key informants list' initially developed for this study;
- supply all the grey literature that they considered relevant to this investigation;
- provide possible new contacts for the list of experts;
- complete a table entitled 'Network where treatment for comorbid patients is provided in EU countries: outpatient and inpatient facilities'.

CHAPTER 4

Epidemiological data on the prevalence of comorbid substance use and mental disorders in Europe

In this chapter, a description of the epidemiological situation regarding comorbidity of mental disorders among individuals with substance use disorders in each of the European countries is given. In the absence of any epidemiological study undertaken in the European Union during the same period and with the same definitions and methodology, a review of available data from different sources of information is described. The information was gathered from the three main sources described in Chapter 3, namely Reitox data provided by the EMCDDA website, a scientific literature search and key informants.

To better understand the prevalence rates of comorbid mental disorders among drug users a number of issues must be taken into account.

Substances considered: There are many different substances that can produce substance use disorders and, in this report, we have focused on illicit drugs (such as heroin, cocaine, cannabis, amphetamines), ignoring tobacco, alcohol and prescribed substances.

Characteristics of the sample studied: It is important to distinguish between studies in general, clinical or special populations (e.g. homeless, prisoners, substance users not seeking treatment). In studies in clinical populations, differences in the setting in which a study has been carried out can also be relevant. There may be huge differences depending on whether the patients come from psychiatric services or drug treatment facilities. In addition, substantial differences can be found if the patients are treated in outpatient clinics or hospital wards. For instance, in the studies identified, comorbid depression and anxiety are more frequent in outpatient centres for drug use, whereas most of the studies in psychiatric hospital wards are related to psychosis, for which cannabis use is of special interest. This can be counterintuitive because cannabis is found in studies conducted in psychiatric hospitals, whereas opioids and

cocaine are more often studied in outpatient drug treatment centres.

Furthermore, some studies focused on non-treatment-seeking populations, thereby providing information on comorbidity in drug-using subjects from another perspective. Several studies based on subjects recruited on the street and reporting on a range of different substances were found, as well as others focused on specific populations not in treatment (e.g. prison inmates, the homeless) in which special circumstances related to mental disorders must be taken into account.

Some studies have been undertaken on specific psychiatric disorders (e.g. depression, attention deficit hyperactivity disorder, post-traumatic stress disorder, eating disorders or bipolar disorder). This aspect is considered in depth in Chapter 5.

Finally, the sex composition of studied populations must be considered, because sex differences have been implicated in drug addiction prevalence as well as in the prevalence of other psychiatric disorders.

Definitions of comorbidity of mental and substance use disorders: As has been reviewed in Chapter 1, the approaches to the diagnosis of comorbid mental disorders among subjects with substance use disorders have evolved from early definitions to the present diagnostic classification systems. These changes must be taken into account to better understand psychiatric comorbidity in substance use disorder epidemiology. Moreover, instruments used to screen or diagnose psychiatric comorbidity are possible confounding factors. This issue is fully covered in Chapter 2.

Time window: The reference period of the comorbidity (last month, last year or lifetime), as well as the concurrence of the disorders in time, is another factor to consider.

TABLE 4.1

Considerations related to interpreting the epidemiology of comorbid mental and substance use disorders

Topics	Aspects to consider
Substances considered	Key drug of use <ul style="list-style-type: none"> Illicit drugs Other substances
Studied sample	General population <ul style="list-style-type: none"> Distribution by sex Drug users seeking treatment <ul style="list-style-type: none"> General hospital Drug use services Mental health services Specific populations <ul style="list-style-type: none"> Not seeking treatment Homeless Prisoners
Comorbidity definition	Diagnostic criteria Diagnostic instruments
Time window	Last month, last year, lifetime
Geographical area particularities	Availability and accessibility to treatment Availability of drugs (drug market)

Specificities of European countries: Wide variability regarding substance use exists in European countries, with particular patterns observable by geographical area. Therefore, variations in drug availability, in trends over time and in aspects related to health services accessibility also need to be considered, especially when comparing the prevalence of psychiatric comorbidity among drug users in different geographical areas.

These considerations related to the epidemiological interpretation of data on psychiatric comorbidity among drug users are summarised in Table 4.1.

Studies on the comorbidity of substance use and mental disorders in Europe

Before describing psychiatric comorbidity in different populations of substance users or psychiatric patients, an overall description of the prevalence of mental disorders in the general population will be provided for comparison. Several studies reporting on the prevalence of psychiatric disorders in the general population have been conducted, both in Europe and in the United States. One series of surveys has been undertaken worldwide under the World Mental Health Survey Initiative, providing results for several countries in Europe and elsewhere. Twelve-month prevalence rates of any anxiety, mood and impulse-control or substance disorder ranged from 26 % in the United States to 8 % in

Italy. In general, lower figures were reported for Asian and African countries (Demyttenaere et al., 2004).

In the United States, longitudinal surveys have been carried out to study the coexistence and evolution of substance use (alcohol use is also considered in these studies) and psychiatric disorders. Those interested in this subject are referred to the National Epidemiological Survey on Alcohol and Related Conditions and the National Comorbidity Survey publications. Unfortunately, no studies of this kind are available for the European Union.

Hence, in what follows, we describe epidemiological studies in accordance with the following population types: general population, patients in general hospitals, patients in drug use services, patients in mental health services, drug users not seeking treatment, prisoners and homeless populations.

General population studies

The main studies relating to the general population, including studies in subsamples (e.g. university students), are described in Table 4.2.

Two European general population studies reporting psychiatric comorbidity were retrieved. In one of these, which was carried out between 1999 and 2003 in a nationally representative sample of the French adult population (sample size 36 105), the prevalence of anxiety disorders and associated comorbidities was estimated. Overall, anxiety disorders were present in 22 % of subjects, among whom 28 % were diagnosed with major depression, while the criteria for alcohol abuse were met by a further 4 % and for drug addiction by a further (3 %), amounting to an estimated 7 % of the French population meeting the diagnostic requirements of an anxiety disorder comorbid with a substance use disorder (Leray et al., 2011).

A national household study of psychiatric morbidity conducted in England and Wales in the early 1990s identified a higher prevalence (47 %) of other psychiatric disorders among drug-dependent (cannabis, hallucinogens and amphetamines) subjects (2 %) compared with subjects either with no substance dependence or with 'only' alcohol or nicotine dependence (Farrell, 2001).

Two other studies exploring dual diagnosis among Spanish university students were assessed. In one study, of 554 students, 58 had a substance use disorder, of whom 9 % had symptoms of a major depressive

TABLE 4.2

General population studies

Authors	Country	Sample size	Assessment tools	Reference population/site/characteristics	Type of disorder	Prevalence, %
Leray et al., 2011	France	36 105	MINI (for anxiety disorders only)	National survey of the French adult population. Mental health in general population (53.9 % males)	Anxiety disorders	21.6
					Anxiety disorders + alcohol use disorder	4.4
					Anxiety disorders + drug use disorder	2.8
Vázquez et al., 2011	Spain	1 054	SCID-CV	Female students (mean age 22.2 years)	Lifetime comorbidity (includes tobacco dependence)	21
					Lifetime prevalence of psychiatric disorders (the commonest disorders were nicotine dependence, depression and generalised anxiety disorder)	50.8
					Two or more psychiatric diagnoses	37
Farrell, 2001	United Kingdom	10 018	CIS-R and DIS ICD-10	National survey of psychiatric morbidity (subjects aged 16–65 years)	Drug dependent (mainly cannabis)	Male: 2.8;
					Among drug dependent:	Female: 1.5
					No disorder	52.9
					Mixed anxiety disorder	16.3
					Generalised anxiety disorder	7.3
					Depression	7.1
					Phobia	5.5
Panic disorder	2.5					
Vázquez, 2010	Spain	554	DSM-IV	University students	Symptoms of major depressive episode + substance dependence (<i>n</i> = 58)	8.6
					Past-month legal substance consumers (<i>n</i> = 540),	8.7
					Past-month illegal substance consumers (<i>n</i> = 140)	12.1

Abbreviations: CIS-R, Clinical Interview Schedule-Revised.

episode (Vázquez, 2010). The other study, among female students only, reported 21 % lifetime comorbidity when nicotine dependence was included in the substance use disorders (Vázquez et al., 2011).

Patients in general hospitals

Table 4.3 presents data from two studies reporting psychiatric comorbidity in a general hospital. One study was undertaken in 1 227 consecutive psychiatric emergency presentations, of which 17 % indicated psychiatric comorbidity (Martín-Santos et al., 2006). The other study, of 9 248 patients who presented with deliberate self-harm, reported that among patients with problem drug use (9 %), 22 % had another psychiatric

diagnosis and 24 % a personality disorder (Haw and Hawton, 2011).

Patients in drug use services

Almost 40 studies have reported some kind of psychiatric comorbidity prevalence data in samples recruited in drug treatment centres (Table 4.4). The variety of forms used to describe results is an added difficulty in summarising the data. For instance, prevalence figures for mood disorders vary from 5 % in an Italian sample of polydrug users (Di Furia et al., 2006) to 90 % in a sample of 150 patients from therapeutic communities in nine European countries (De Wilde et al., 2007). Of interest is a series of Spanish studies in which

TABLE 4.3

Patients in general hospitals

Authors	Country	Sample size	Assessment tools	Reference population/site/characteristics	Type of disorder	Prevalence, %
Martín-Santos et al., 2006	Spain	1 227	Clinical diagnosis	Emergency room	Comorbidity	17
					Axis I	74
					SUD	9
Haw and Hawton, 2011	United Kingdom	9 248	ICD-10	Emergency room for suicidal attempt	Problem drug use (PDU)	8.7
					PDU + personality disorders	24.2
					PDU + any psychiatric diagnosis	21.9

TABLE 4.4

Patients in drug use services

Authors/ source	Country	Sample size	Assessment tools	Reference population/ site/characteristics	Type of disorder	Prevalence, %
EMCDDA, 2013a	Austria	228	Self-reported survey	Opioid substitution treatment users	Depression (lifetime) Anxiety disorders (lifetime)	60.5 41
EMCDDA, 2012	Austria	8 500 (2011 data)	Self-reported survey	Vienna's BADO Basic Documentation of addiction and drug treatment and support services	Psychiatric problems	15
EMCDDA, 2012	Austria	201	N/A	Drug users in treatment	Affective disorders (e.g. depression), personality and behavioural disorders, neurotic, stress and somatoform disorders	60
EMCDDA, 2012	Austria	27	Survey	Drug treatment clients in Graz. Mephedrone users	Affective disorders	81.5
EMCDDA, 2013a	Belgium	670 (2012 data)	EUROPASI	Drug users entering treatment (Flemish region)	Dual diagnosis Severe Moderate	48.6 11 37.6
EMCDDA, 2011	Bulgaria	3 452	N/A	Substitution and maintenance programmes (94.7 % methadone; 5.3 % substitol)	Personality disorder, anxiety and schizophrenia	20
EMCDDA, 2011	Croatia	7 550 (2010 data)	Healthcare institutions	Drug users in treatment	Dual diagnosis Affective disorders Anxiety disorders Psychotic disorders	21 (1 585) 20.3 13.6 15.5
EMCDDA, 2010	Cyprus	785 (2009 data)	Self-reported	Drug users in treatment	Psychiatric symptoms (lifetime): Stress Difficulty in concentration Depression	> 50 32 27
EMCDDA, 2012	Cyprus	1 057	Clinical observations from treatment centres	Drug users requesting treatment	High rates in percentages in psychiatric clinics and lower rates from adolescent drug services	3–85
EMCDDA, 2012	Czech Republic	N/A (2010 data)	ICD-10	Comorbidity in hospitalisations of addictive substance users in psychiatric inpatient facilities	Mental and behavioural disorders Alcohol (<i>n</i> = 10 003) Opioids (<i>n</i> = 696) Cannabis (<i>n</i> = 199) Sedatives/hypnotics (<i>n</i> = 306) Cocaine (<i>n</i> = 2) Other stimulants (<i>n</i> = 1 626) Hallucinogens (<i>n</i> = 9) Tobacco (<i>n</i> = 3) Inhalants (<i>n</i> = 42) Polydrug use (<i>n</i> = 2 476)	29.9 28.3 79.4 63.1 50.0 48.0 100.0 66.7 14.3 25.6
Arendt et al., 2011	Denmark	20 581	Register-based mortality (Danish Psychiatric Case Register, 1996–2006)	Persons in treatment for illicit substance use	Injection drug + comorbidity and mortality	N/A
EMCDDA, 2010	Finland	N/A	N/A	Drug users	Depression or other mental disorder	> 50
EMCDDA, 2011	France		Self-report	Drug users	Poor psychological health	50
EMCDDA, 2013a	Greece	11 604	N/A	Drug users in treatment	Type of disorder N/A	23.2
EMCDDA, 2007	Hungary	200	Survey about psychological problems during the past 30 days	Drug users in treatment (men: 74 %; women: 24 %)	Boredom or sadness or slight depression or anxiety or intensive worrying	57

TABLE 4.4 (continued)

Authors/ source	Country	Sample size	Assessment tools	Reference population/ site/characteristics	Type of disorder	Prevalence, %
EMCDDA, 2007	Italy	N/A	N/A	Drug users (opioids and polydrug) in treatment (mean age: 36 years; mainly males)	Affective psychoses Neurotic–somatic disturbances Schizophrenic psychoses Other disturbances Paranoid state Overall	18 10 7 7 1 22
Riglietta et al., 2006	Italy (Bergamo)	197	SCL-90-R Current	Opiate dependent	Obsessive compulsive disorder Depressive illness	73 67
Di Furia et al., 2006	Italy (Padua)	61	EUROPASI and CIDI-C 1 month	Polydrug users	Anxiety Somatoform Mood disorders	34.4 11.5 4.9
EMCDDA, 2009	Latvia	N/A	N/A	Drug users in treatment	Organic mental disorders Behavioural and emotional disorders Neurotic/stress-related disorders	25 21 17
EMCDDA, 2009	Luxembourg	N/A	N/A	Drug users in treatment	Anxiety, depression, neurosis/ psychosis, borderline behaviour. Had previous contacts with psychiatric services	83
EMCDDA, 2007	Netherlands	202	MINI	Opioid users in methadone treatment	Major depression Generalised anxiety disorders Psychotic disorder Current psychotic disorder	34 3 39 9
EMCDDA, 2005	Portugal	N/A	N/A	Long-term addicts undergoing treatment	Depression	53
EMCDDA, 2009	Romania	N/A	N/A	Drug users in treatment	Behavioural and emotional disorder	14
Enatescu and Dehelean, 2006	Romania	304	Lifetime (case records)	Drug- and alcohol- dependent	Cumulative Schizophrenia Mixed anxiety and depression Personality disorder	75 12 12 30
EMCDDA, 2007	Spain	N/A	N/A	Drug users in treatment	Personality disorders: Antisocial disorder and borderline disorder Paranoid disorder Narcissistic and schizoid disorders Overall	12 3 2 13
Araos et al., 2014	Spain	110	PRISM	Outpatient drug users	Axis I + II	C: 42; LT: 62
Vergara- Moragues et al., 2012	Spain	227	PRISM	Therapeutic communities	Axis I Axis I + II	C: 41; LT: 56 C: 58; LT: 66
Astals et al., 2009	Spain	189	PRISM	Methadone maintenance treatment	Axis I Axis I + II	C: 21; LT: 34 C: 32; LT: 44
Pedrero-Perez et al., 2011	Spain	696	ADHD self- report scale Wender-Utah rating scale and the Parents rating scale	Substance use disorders	ADHD	6.9
Huntley et al., 2012	United Kingdom (London)	226	ADHD screening Diagnostic Interview for ADHD in Adults (DIVA 2.0)	People attending inpatient drug and alcohol detoxification units in south-east London	ADHD + substance use disorder	12.2
Gual, 2007	Spain	2 361	Interview by experts	Different settings of addiction treatment	Comorbidity Depression Anxiety disorders	33.8 21.6 11.7
Nocon et al., 2007	Spain	115	PRISM 1 year	Detox unit	Axis I Axis I + II	C: 35; LT: 50 C: 59; LT: 67

TABLE 4.4 (continued)

Authors/ source	Country	Sample size	Assessment tools	Reference population/ site/characteristics	Type of disorder	Prevalence, %
Langås et al., 2012b	Norway	61	PRISM SCID-II	Substance use disorder (specialised treatment)	AUD DUD and: depressive social phobia post-traumatic stress disorder	71 31 18
De Wilde et al., 2007	Netherlands Belgium	150	EuropASI SCID-III-R or SCID-IV depending the country/ language	Therapeutic communities from nine countries (Sweden, Norway, Belgium, France, Germany, Scotland, Greece, Italy and Spain)	Any mood disorder Any anxiety disorder	Male: 90.9 Female: 89.7 Male: 76.7 Female: 76.9
Shahriyarmolki and Meynen, 2014	United Kingdom	225	Cross-sectional survey with a new screening instrument	Addiction centres (71 % males)	DD	70
Szerman et al., 2011	Spain	400	Clinical histories	Community mental health and substance misuse services	DD in substance misuse services (N = 261) DD in mental health services (N = 139)	36.78 28.78
EMCDDA, 2008–2012	Czech Republic	92	N/A	Therapeutic communities (pervitin and/or opioids)	Personality disorders Depressive or anxiety disorder Psychotic disorder (includes induced)	38 25 16

Abbreviations: ADHD, attention deficit and hyperactivity disorder; AUD, alcohol use disorder; C, current; DD, dual diagnosis; DUD, drug use disorder; LT, lifetime; N/A, not applicable.

Sources: Data from EMCDDA 2004–14, Reitox National reports and EMCDDA (2013a).

diagnoses were assessed through the same instrument (the PRISM). Although samples come from different geographical areas in the country and different drug treatment facilities, results can be summarised with similar criteria, giving a range for current Axis-I and -II disorders from 42 % in an outpatient centre to 58 % and 59 % in a therapeutic community or detox unit, respectively. Lifetime data were 62 %, 66 % and 67 %, respectively (Araos et al., 2014; Astals et al., 2008; Nocon et al., 2007; Pedrero-Perez et al., 2011; Vergara-Moragues et al., 2012).

Patients in mental health services

Although many studies were conducted in mental health services, few of them actually report on psychiatric comorbidity (Table 4.5). The presence of some substance use only, and not necessarily a substance use disorder, was assessed. Three studies report on comorbidity in patients with schizophrenia (Carrà et al., 2012; Hermle et al., 2013; Schnell et al., 2010) and a fourth (Toteva et al., 2006) reports on psychiatric disorders among drug- and alcohol-dependent patients in psychiatric clinics.

In Carrà et al. (2012), 1 208 psychiatric patients diagnosed with schizophrenia had been recruited from three European countries. Their lifetime comorbidity (any

substance-use dependence) differed by country (35 % in the United Kingdom, 21 % in Germany and 19 % in France); dependence disorders were also more common than in the general population. Two studies in Germany found the prevalence of schizophrenia with substance use disorders to be 29 % and 47 %, respectively (Hermle et al., 2013; Schnell et al., 2010).

Not unexpectedly, the most frequent disorders in the Toteva study were mood disorders, in particular depression. Prevalence rates were different in the two cities studied (19 % in Sofia and 11 % in Pleven) (Toteva et al., 2006).

Interestingly, the psychiatric diagnoses more frequently studied have been psychotic disorders (e.g. schizophrenia) and attention deficit hyperactivity disorder. As expected, the more frequently reported substance use has related to alcohol and cannabis, as they are the more prevalent in the general population in most European countries. Barnett et al. (2007) assessed their use among subjects presenting with a first episode of psychosis and found prevalence rates that were twice that of the general population. In another study of 196 psychotic patients in three European countries, those with any substance use were younger (Baldacchino et al., 2009). This study also found site differences related to sociodemographic variables and drug-use patterns.

TABLE 4.5
Patients in mental health services

Authors	Country	Sample size	Assessment tools	Reference population/site/ characteristics	Type of disorder	Prevalence, %
EMCDDA, 2010	Belgium	88 824	N/A	Psychiatric patients	Induced diagnoses Substance-induced anxiety disorder Substance-induced psychotic disorder + delusions Substance withdrawal Substance-induced psychotic disorder + hallucinations Substance intoxication delirium Substance-related disorder not otherwise specified Substance-induced mood disorders Substance-induced persisting amnesic disorders Substance-induced persisting dementia	1.7 73.6 11 7.6 3.9 2.9 2.4 1.4 0.5 0.4
EMCDDA, 1996–2000	Denmark	10 561	ICD-8 or ICD-10 criteria	Drug users receiving treatment in mental health services	Schizophrenia Bipolar disorder Other affective disorder Anxiety Personality disorders	3.3 0.67 2.6 6.78 7.2
EMCDDA, 2013a	Denmark	5 709	N/A	Psychiatric patients with drug-related primary (<i>N</i> = 1 763) or secondary diagnosis (<i>N</i> = 3 946)	Panic reactions Anxiety attacks Depression Personality disturbances	N/A
EMCDDA, 2010	Germany	151	N/A	Psychiatric patients (aged 13–22 years)	Anxiety disorders Affective disorders Somatoform disorders Attention deficit and hyperactivity disorder Overall	23 19 9 9 28–52
EMCDDA, 2011	Lithuania	745 (2007)		Drug users in treatment	N/A	9
EMCDDA, 2010	Norway	N/A		Psychiatric patients Psychiatric emergency patients	N/A	Psychiatric patients: 23 Emergency rooms: 20–47
EMCDDA, 2013a	Poland	14 089	ICD-10	Patients with drug problems admitted to residential psychiatric treatment	Personality disorder Depression Other affective disorder Anxiety disorders Other mental disorders	Total 7.9 25 5 1 9 60
Vaz Carneiro and Borrego, 2007	Portugal	422	ICD-9	Psychiatric hospital inpatients, 2001–04	Psychosis + history of substance use disorder Cannabis and alcohol	42
EMCDDA, 2004	Slovakia	N/A	N/A	Patients of psychiatric hospitals	Schizophrenia (in the past years + correlation with cannabis treatment demand)	14
EMCDDA, 2012	Slovakia	318	Clinical records review ICD-10	Inpatients of psychiatric hospitals (68 % males and 32 % females) (aged 23 years)	Psychotic disorders	29
Harrison et al., 2008	United Kingdom	152	Diagnostic review by two senior clinicians and several instruments	First episode schizophrenia	Alcohol Cannabis	30 LT to 15 at follow-up 63 LT (32 C) to 18.5 follow-up

TABLE 4.5 (continued)

Authors	Country	Sample size	Assessment tools	Reference population/site/ characteristics	Type of disorder	Prevalence, %
Carrà et al., 2012	France, Germany and United Kingdom	1 208	Schedules for Clinical Assessment in Neuropsychiatry version 1.0	EuroSC Nine centres in the United Kingdom, France and Germany (18–64 years)	Schizophrenia + substance use disorder	United Kingdom: 35 France: 19 Germany: 21
Sizoo et al., 2010	Netherlands	123	Research clinician and EUROPASI	Psychiatric patients (autism and ADHD)	70 autism spectrum disorders 53 ADHD	30 50
Wüsthoff et al., 2011	Norway	2 154 N No SUD = 1 786 N SUD = 368	Health of the nation outcome scales; alcohol-use scale; and drug-use scale	Community Mental Health Centres	Psychotic disorders Mood disorders Anxiety disorders Other psychiatric disorders	10.7 33.9 22.9 11.3
Ilomäki et al., 2008	Finland	300 girls 208 boys (12–17 years)	Schedule for Affective disorders and Schizophrenia for School Aged Children — Present and past	Psychiatric inpatient	Behavioural disorders associated to both alcohol and drug dependence, for both boys and girls. Depressive disorders associated with both OH (OR 3.1) and drug dependence (OR 3.8) among boys, but not girls	
Hermle et al., 2013	Germany	448	EUROPASI	Psychiatric patients	Schizophrenia + substance use disorder	47.5
Charzynska et al., 2011	Poland and others	352	ISADORA study MINI, ASI	Psychiatric patients	Mood disorders Psychosis	59.6 40.3
Błachut et al., 2013	Poland	4 349	Retrospective study: clinical histories	Psychiatric patients	Dual diagnosis patients	8.3
Pompili et al., 2009	Italy	31 comorbid; 31 non-comorbid	MINI; the Temperament Evaluation of Memphis, PISA Paris and San Diego autoquestionnaire; SCL-90-R; Gotland male depression scale; Beck hopelessness scale	Psychiatric outpatients with/ without substance use disorder	More depressed higher dysthymic cyclothymic anxiety and irritability	
Baldacchino et al., 2009	United Kingdom, Denmark, Germany and Italy	196	SCAN	Psychotic patients	Substance users younger and with more symptoms than non-comorbid patients. Sociodemographic and drug-use patterns differences by site	
Barnett et al., 2007	United Kingdom	123	SCID-I	First psychotic episode patients	Cannabis Alcohol abuse	51 43
Schnell et al., 2010	Germany	2 337	N/A	Inpatient and outpatient, university and mental health hospital	Schizophrenia + lifetime substance use disorder	29.4
Rasmussen and Levander, 2009	Norway	600	The checklist for research criteria for ICD-10; F90 hyperkinetic checklist; SCL-90-R	Consecutive patients for ADHD treatment	ADHD + alcohol ADHD + drugs	Male Female 37 18 45 29
Rodríguez-Jiménez et al., 2008	Spain	257	DSM-IV	Psychiatric hospital admissions	Dual diagnosis Schizophrenia Psychosis Depression Bipolar Personality Others	25 28.1 53.1 7.8 4.7 1.6 4.7

TABLE 4.5 (continued)

Authors	Country	Sample size	Assessment tools	Reference population/site/ characteristics	Type of disorder	Prevalence, %
Carrà and Johnson, 2009	United Kingdom	N/A	Literature review	Psychotic patients	In mental health settings In addiction settings	20–37 6–15
Halmøy et al., 2009	Norway	414	DSM-IV	ADHD national registry	And problems with drugs (400) Problems with alcohol and other drugs (397)	Male Female 36.1 17.7 19.2 9.0
Toteva et al., 2006	Bulgaria	Sofia: 188; Pleven: 262	Structured diagnostic interviews; ICD-10; psychiatric and neurological observations; Administration of the Multicity Questionnaire	Drug- and alcohol-dependent patients in psychiatric clinics	N = 56 (29.78 %, Sofia) alcohol dependence N = 47 (17.30 %, Pleven) alcohol dependence N = 16 (8.51 %, Sofia) SUD N = 9 (3.44 %, Pleven) SUD	Depression: 37.5 10.52 18.75 11.11

Abbreviations: ADHD, attention deficit and hyperactivity disorder; ASI, Addiction Severity Index; C, current; EUROPASI, European Addiction Severity Index; EuroSC, European Schizophrenia Cohort; LT, lifetime; N/A, not applicable; OR, odds ratio; SUD, substance use disorder.
Sources: Data from EMCDDA 2004–14, Reitox National reports EMCDDA (2013a).

Drug users not seeking treatment

In Spain, four studies explored psychiatric comorbidity in young drug users (18–30 years old) in the community (Table 4.6). All studies used PRISM as the assessment tool. In two studies, users of heroin, cocaine or both drugs were recruited in the community by means of respondent-driven samples. Among 149 heroin and cocaine users, a 67 % prevalence of lifetime psychiatric comorbidity was reported (Rodríguez-Llera et al., 2006). A total of 139 cocaine users with no current heroin use were evaluated, yielding a lifetime comorbidity of 42 % (Herrero et al., 2008). The other two studies recruited subjects by word of mouth (ecstasy users), or by contacting them at university or in youth and leisure centres and by distributing leaflets directing readers to a website (regular cannabis users), and found lifetime comorbidity in 47 % and 18 % of subjects, respectively (Cuenca-Royo et al., 2013; Martín-Santos et al., 2010).

Prison populations

Ten studies dealing with psychiatric disorders in forensic populations (prisoners and offenders) were analysed. In addition, two Reitox reports analysed the prevalence of psychiatric disorders in prisoners (Table 4.7). The aims of these studies did not always include that of reporting dual diagnostic figures; for example, Harsch et al. (2006) assessed psychiatric disorders in different offender subpopulations, whereas others analysed whether recidivism has any relation to specific disorders (Brand et al., 2009; Colins et al., 2011). In the studies in which they are reported, psychiatric comorbidity figures vary from 21 % in male prisoners in Perugia (Italy) (Piselli et al., 2009) to approximately 85 % in drug-addicted prison inmates in Asturias (Spain) (Casares-López et al., 2011). One review study (Palijan et al., 2009) reported figures ranging from 50 % to 80 %.

TABLE 4.6

Special populations studies: drug users not seeking treatment

Authors	Country	Sample size	Assessment tools	Reference population/site/ characteristics	Type of disorder	Prevalence, %
Herrero et al., 2008	Spain	139	PRISM	Cocaine users in the street (18–30 years)	Comorbidity (lifetime)	42.5
Rodríguez-Llera et al., 2006	Spain	149	PRISM	Heroin users in the street (18–30 years)	Comorbidity (lifetime)	67.1
Martín-Santos et al., 2010	Spain	37	PRISM	Ecstasy users	Comorbidity (lifetime)	47
Cuenca-Royo et al., 2013	Spain	289	PRISM	Regular cannabis users (18–30 years)	Lifetime psychiatric comorbidity (Axis-I and/or Axis-II disorder) + substance use disorder	18

TABLE 4.7

Special population studies: prison populations

Authors	Country	Sample size	Assessment tools	Reference population/site/ characteristics	Type of disorder	Prevalence, %
EMCDDA, 2009–2010	Estonia	870 (2009) 877 (2010)	N/A	Prisoners	Drug use-related mental or behavioural disorders	Both 24.5
EMCDDA, 2010	France	N/A	N/A	Inmates	Mood disorder Anxiety disorder	20 20
Lukasiewicz et al., 2009	France	998	MINI-5 plus TCI plus senior interview	Prisoners	If SUD, DD comorbidity If Axis-I psychiatric disorder, SUD	80 33
Einarsson et al., 2009	Iceland	90	MINI and SAPAS (personality); childhood ADHD symptoms: with the Wender-Utah rating scale and current ADHD with DSM-IV	Male prisoners (incoming)	ADHD and psychiatric conditions	50
Piselli et al., 2009	Italy	302 Perugia 2005–2006	Semi-structured interview	Male prisoners (incoming)	Psychiatric disorder, including SUD Comorbidity	54.3 20.9
Casares-López et al., 2011	Spain	152	ASI MINI-6	SUD prison inmates	Dual diagnosis Antisocial personality disorder Depression Anxiety	85 65.5 35.9 25.5
Sørland and Kjelsberg, 2009	Norway	40	K-SADS	Teenaged boys remanded to prison	Mental disorder SUD	90 75
Colins et al., 2011	Belgium	232	DISC	Detained adolescents		Recidivism greater if SUD
Palijan et al., 2009	Croatia	Review		Violent offenders	Comorbidity	50–80
van Horn et al., 2012	Netherlands	148		Violence offenders	Violence and DD Axis-I or Axis-II comorbidity 50 violent offenders with DD	34
Elonheimo et al., 2007	Finland	2 712 males	National registers	Young male offenders	SUD and/or psychiatric disorders	59 if > 5 crimes
Harsch et al., 2006	Germany	47 + 30 + 26	SCID and SCID II. GAF, BSS	Forensic/prison (sexual offenders)	Mental disorders	80 (compares different forensic subpopulations)

Abbreviations: ADHD, attention deficit hyperactivity disorder; ASI, Addiction Severity Index; BSS, Beck Scale for Suicide Ideation; DD, dual diagnosis; DISC, Dominance, Influence, Steadiness and Compliance; GAF, Global Assessment of Functioning; K-SADS, Kiddie Schedule for Affective Disorders and Schizophrenia; N/A, not applicable; SAPAS, Standardised Assessment of Personality; SUD, substance use disorder.

Sources: Data from EMCDDA 2004–14, Reitox National reports, EMCDDA (2013a).

Homeless populations

Three studies dealt with psychiatric disorders in samples of homeless people (Table 4.8). Their aims were different and did not always focus on the prevalence of psychiatric comorbidity. One study was a follow-up study of 82 homeless subjects in Sweden relating to mortality (Beijer et al., 2007), which found mental disorders associated to the misuse of alcohol and illicit

drugs in 74 % of cases. The other study, in Austria, explored diagnoses in 40 homeless youths, reporting that 80 % had some psychiatric disorder, which was frequently comorbid (65 % substance abuse/dependence) (Aichhorn et al., 2008). Finally, 212 homeless people were studied in France, to elucidate the interrelation between personality disorders, drug use and homelessness; 95 % of the homeless subjects had a personality disorder (Combaluzier et al., 2009).

TABLE 4.8

Special populations studies: homeless populations

Authors	Country	Sample size	Assessment tools	Reference population/site/characteristics	Type of disorder	Prevalence, %
Aichhorn et al., 2008	Austria	40	SCID-I	Homeless youth	Psychiatric disorders	80
					Substance abuse/dependence	65
					Mood	42.5
					Anxiety	17.5
					Eating disorders	17.5
					History of self-harm	57.5
At least one suicide attempt reported	25					
Combaluzier et al., 2009	France	212	DSM-IV	Homeless with substance use disorder	Personality	95
Beijer et al., 2007	Stockholm	46 (2001)		Homeless with mental health problems	Mental health problems in combination with misuse of alcohol or illicit drugs	74

Identification of information gaps and methodological recommendations

Although there is considerable interest in the subject, as shown by the many studies identified, there is difficulty in achieving an overall perspective of psychiatric comorbidity among individuals with substance use disorders in Europe. To understand how this can be, it is necessary to note that the amount and direction of research undertaken in any country will be shaped by a multiplicity of factors, including the interests of the experts in the topic in the country, as well as the areas in which these experts work (such as drug use, psychiatry). In addition, constructing a European picture of a phenomenon as complicated as psychiatric comorbidity among drug users, from the results of studies carried out in different countries, will depend, among other things, on the degree of development of common instruments and methodology.

In fact, when comparing available European information with that from the United States or Australia, the lack of data enabling a wide assessment of the current picture in Europe becomes clearly evident. In the specific field of mental disorders, the World Mental Health Survey Initiative includes several European countries but,

unfortunately, substance use disorders are not studied. Our recommendation would be to plan a multinational study involving European countries, preferably including general population samples, evaluated using a common methodology and instruments. This would enable comparison of results and promote working towards a more harmonised assessment of the management and treatment needs of these comorbid patients.

Summary

Several factors, related not only to the drug situation but also to treatment services, including where a study was carried out and what methodologies were used, mean that data on the prevalence of psychiatric comorbidity among drug users in European countries are very heterogeneous. A higher prevalence of comorbidity in drug-using populations than in non-drug-using populations has been reported.

There is considerable interest in studying psychiatric comorbidity in drug users, and there is an unmet need for reliable instruments and common methodologies to determine its magnitude in Europe, in order to offer better treatment.

CHAPTER 5

Specific characteristics of comorbid mental and substance use disorders and clinical recommendations

As mentioned in the previous chapter, psychiatric comorbidity among those with drug use problems is common, with different prevalence figures reported for different combinations of mental and substance use disorders. Clinical diagnosis of comorbid psychiatric disorders in subjects with a substance use disorder involves certain difficulties, and the importance of using structured and semi-structured interviews to achieve valid and reliable diagnosis should be emphasised. In this chapter, we discuss specific clinical aspects of the more common combinations of comorbid mental and substance use disorders and the main treatment recommendations suggested by the available studies and guidelines (Mills et al., 2009; NICE, 2011).

Depression and substance use disorders

Depression and a substance use disorder is the most common comorbidity, with prevalence rates ranging from 12 % to 80 % (Torrens et al., 2011a), depending on the characteristics of the sample (e.g. clinical versus non-clinical sample, diagnostic criteria used). Various neurobiological mechanisms are hypothesised to participate in the aetiology of these dual disorders, determining a clinical phenotype that is often severe and with a poorer prognosis than addiction and mood disorders alone. Clinical data point out that people affected by major depression show a higher vulnerability to developing a substance use disorder, and that people with substance use disorders have a higher risk of developing major depression during their life than the general population. Furthermore, the co-occurrence of substance use disorders and major depression is a predictor of clinical severity.

Table 5.1 summarises some of the studies performed within the European Union relating to lifetime prevalence

of major depression among different substance abusers, assessed in different settings. In addition, studies indicate that comorbid major depression is more frequent in women with substance use disorders than in men with substance use disorders. Among this group of women, the prevalence of major depression is twice that of women in the European general population, making them an especially vulnerable population and a particularly sensitive target for treatment policies (Torrens et al., 2011b). Furthermore, in most of the studies, comorbid primary (independent) major depression is more frequent than substance-induced major depression (Blanco et al., 2012; Maremmani et al., 2011; Samet et al., 2013; Torrens et al., 2011b), and follow-up studies report that a sizeable proportion of individuals with substance-induced major depression is later reclassified as having independent major depression disorder (Magidson et al., 2013; Martín-Santos et al., 2010).

Greater severity in one of these disorders can be associated with greater severity in the other. These patients show a more severe clinical course, respond poorly to treatment and have a poorer overall prognosis for both disorders (Hasin and Grant, 2004). The comorbid occurrence of major depression with a substance use disorder shows a worse rate of improvement under treatment and, as a consequence, an unfavourable course for the major depression itself (Torrens et al., 2005). However, the presence of major depression is also associated with an unfavourable course for the substance use disorder (Conner, 2011; Samet et al., 2013). Furthermore, these dual diagnosed patients present a higher prevalence of attempted or completed suicide compared with those with only one disorder (Blanco et al., 2012; Conner, 2011; Marmorstein, 2012).

Apart from major depression, patients with comorbid substance use disorders often present or develop other medical, psychiatric or substance-use comorbidities, making treatment even more challenging. Hence, as may

TABLE 5.1

Lifetime prevalence of major depression among different substance abusers, assessed in different settings within the European Union

Study	Number of subjects	Main drug of abuse	Sample	Diagnosis criteria	Diagnostic instrument	Lifetime prevalence of major depression, %		
						Any	Primary	Induced
Rodríguez-Llera et al., 2006	149	Heroin	Non-treatment-seeking users	DSM-IV	PRISM	26.8	17.4	9.4
Astals et al., 2009	189	Heroin	Treatment-seeking users	DSM-IV	PRISM	18	12.7	5.3
Maremmani et al., 2011	1 090	Heroin	Treatment-seeking users	DSM-IV	DAHRS (substance use) Decision trees for differential diagnosis + SID	55.8 (11.8 undetermined)	25.1	18.9
Herrero et al., 2008	139	Cocaine	Non-treatment-seeking users	DSM-IV	PRISM	30.2	19.4	10.8
Araos et al., 2014	110	Cocaine	Treatment-seeking users	DSM-IV	PRISM	40.9	16.4	24.5
Cuenca-Royo, et al., 2013	289	Cannabis	General population	DSM-IV	PRISM	17	13.5	3.5
Martín-Santos et al., 2010	37	Ecstasy	Non-treatment-seeking users	DSM-IV	PRISM	40.5	13.5	27

Abbreviations: CIDI, Composite International Diagnostic Interview; DAHRS, Drug Addiction History Rating Scale; DSM IV, Diagnostic and Statistical Manual of Mental Disorder IV edition; PRISM, Psychiatric Research Interview for Substance and Mental Disorders; SID, Semi-Structured Interview for Depression.

be expected from such a severe clinical picture, dual diagnosis patients have considerable psychosocial disability and increased utilisation of healthcare resources, including emergency visits and psychiatric hospitalisation (Martín-Santos et al., 2006; Mueller et al., 1994; Pettinati et al., 2013; Samet et al., 2013).

Treatment recommendations

From systematic reviews and meta-analyses of randomised clinical trials of comorbid major depression and substance use disorders (Nunes and Levin, 2004, 2006; Pani et al., 2010; Torrens et al., 2005) two main conclusions can be drawn. First, antidepressant treatments improve depression only when it is comorbid with alcohol dependence; furthermore, this improvement occurs only with imipramine, desipramine and nefazodone and selective serotonin reuptake inhibitors (SSRIs) are not effective. And, secondly, treating depressed substance-dependent patients with antidepressants does not directly affect their substance use. Antidepressants have little effect on the maintenance of abstinence. When an antidepressant is effective in treating acute depression, there is only a relative reduction in the use of the psychoactive substance. This suggests that specific and concomitant treatment for substance use disorders is required.

One additional concern when treating these comorbid patients is the safety of the treatment itself, owing to both the prevalence of the comorbid physical illness (e.g. HIV or hepatitis C virus infections, hepatic cirrhosis) and the risk of interactions with any other drugs — legal or illegal — that the person may be taking (e.g. risk of corrected QT interval prolongation in HIV-infected patients receiving methadone maintenance treatment and SSRIs) (Funk, 2013; Vallecillo et al., 2013). The main interactions and general recommendations concerning the clinical management of patients with major depression and substance use disorders have been published (Torrens et al., 2011a). Furthermore, in a controlled trial among depressed cannabis-dependent adults, not only did venlafaxine-extended release have no antidepressant effect compared with placebo, but an increase in herbal cannabis use was also reported (Levin et al., 2013).

In addition to the aspects already mentioned in relation to the efficacy and safety of antidepressant use, and possible interactions with the consumption of various substances or other drugs (including increase in drug use), the potential for abuse of different antidepressant drugs must also be taken into account when considering treatment strategies. Although antidepressants are generally thought to have low abuse liability, and the vast majority of individuals prescribed antidepressants do not misuse them, there is evidence in the literature of their misuse and abuse, as well as evidence of

dependence. The majority of reported cases of antidepressant abuse occur in individuals with comorbid substance use disorders and mood disorders. Cases of misuse of all kinds of antidepressants drugs, with the exception of trazodone, nefazodone and mirtazapine, have been reported (Evans and Sullivan, 2014).

Cognitive-behavioural therapy (CBT) is a well-established tool in the treatment of both major depression and substance use disorders. The combined treatment of dual disorders is not as common in clinical practice as it should be, despite the fact that most of the published data and clinical experiences indicate that this could be of great importance to achieve better outcomes. Nevertheless, a growing number of combined treatments for comorbid major depression and substance use disorders are available, including psychotherapeutic treatments as an adjunct to pharmacological treatment. The impact of different psychotherapies, such as CBT, Twelve-Step Facilitation and motivational interviewing on major depression or on substance use disorders alone has been investigated, with controversial results, which have been evaluated in a recently published meta-analysis (Riper et al., 2014). The effectiveness of psychotherapy was also evaluated in dual disorders, with encouraging results. However, the effect sizes of CBT/motivational interviewing treatments appeared smaller than those found in antidepressant treatments.

Anxiety disorders and substance use disorder

Anxiety disorders (in particular panic disorder and post-traumatic stress disorder) are commonly seen in association with substance use. However, the causal relationships between anxiety disorders and substance use (self-medication theories, substance-induced anxiety) are not clearly established and also depend on the specific combination of drugs (e.g. cocaine, cannabis) and anxiety disorder (e.g. post-traumatic stress disorder, panic disorder). The rate of this comorbidity has been reported to be as high as 35 % (Clark and Young, 2009; Fatséas et al., 2010; Grant et al., 2005b) with different rates for different combinations of anxiety disorders and drugs (Sansone and Sansone, 2010). Despite such high prevalence rates, anxiety disorders are still underdiagnosed, especially in substance use treatment settings. Given that both intoxication by, and withdrawal symptoms from, many substances may cause or be associated with anxiety symptoms, the assessment of anxiety disorders among

substance-using populations is challenging, requires particularly careful assessment and needs to be specifically addressed.

Anxiety is common in people who use cannabis, particularly in those who began use at a young age. Heavier or more frequent use of cannabis is a strong predictor of anxiety. Cannabis can induce anxiety or panic attacks, especially in naive users. In chronic users, cannabis tends to have the opposite effect, acting more as an anxiolytic at the time of use. It is also thought that anxiety may predispose people to cannabis use problems (Coscas et al., 2013; Schier et al., 2012).

The prevalence of anxiety disorders among opioid users ranges from 26 % to 35 % (Fatséas et al., 2010). Among anxiety disorders, panic disorder (with or without agoraphobia) and post-traumatic stress disorder are the most frequent (with prevalence ranging from less than 1 % to 10 % and approximately 30% respectively). The identification of substance-induced versus independent anxiety disorder has important treatment implications. The monitoring of anxiety symptoms after several weeks of abstinence may allow physicians to determine the relationship between dependence and anxiety and to make a reliable diagnosis of any initial anxiety disorder.

Anxiety disorders are also common among cocaine, amphetamine and ecstasy users. The lifetime prevalence of anxiety disorders ranges from 13 % to 23 % (Araos et al., 2014; Herrero et al., 2008; Martín-Santos et al., 2010).

Treatment recommendations

Although the treatment of various anxiety disorders is broadly developed and well managed in everyday clinical practice, there is little research on the treatment of comorbid anxiety disorders and substance use disorders. Anxiety disorders, when they occur alone, can be treated with a wide range of therapies. SSRIs or other antidepressants (e.g. tricyclic antidepressants or dual action antidepressants) would be an option in most cases. Benzodiazepines may be useful as an adjunctive therapy early in treatment, particularly for an acute anxiety episode or while waiting for onset of adequate response to SSRIs or other antidepressant (Katzman et al., 2014; NICE, 2011). In patients with anxiety disorders and comorbid substance use disorders, the risk of the potential misuse of benzodiazepines needs to be considered when prescribing such drugs in these patients (Fatséas et al., 2010; O'Brien et al., 2005). Attention should be paid to their prescription, as, although not contraindicated, it might have serious risks for the patient. However, 'there are only a few evidence-

based clinical guidelines available to support practitioners on the use and management of benzodiazepines among high-risk opioid users' (EMCDDA, 2015), and, as such, their use should be avoided if possible. The SSRIs or serotonin–norepinephrine reuptake inhibitors (e.g., venlafaxine) are generally considered first-line treatments with tricyclics. Related to this is the important consideration of using medications that are not likely to contribute to potentially toxic interactions with drugs and alcohol. Prescription of tricyclic antidepressants may also be of concern owing to the risk of cardiac toxicity and seizures and the potential for overdose in suicide attempts (Brady and Verduin, 2005; Kelly et al., 2012; McKenzie and McFarland, 2007; Thundiyil et al., 2007).

Hesse (2009) reviewed the available studies on the integrated psychological treatment for comorbid anxiety and substance use disorders and concluded that psychological intervention increased the number of abstinent days, decreased symptoms and improved retention, albeit at a non-significant level for these last two results. Hesse concluded that psychological interventions alone are not sufficient for the treatment of anxiety and substance use disorders and that there is a need for other integrated treatments for this comorbidity. Combining CBT with antidepressants has the most evidence-based support for the treatment of comorbid opioid and anxiety disorders (Fatséas et al., 2010). One emerging trend is that provocative therapies, such as imaginal exposure, and CBT homework can be beneficial but should not be emphasised prior to the control of substance use because the anxiety associated with the therapy may exacerbate substance abuse (Kelly and Daley, 2013; Kelly et al., 2012).

Psychosis and substance use disorders

Comorbid substance-use disorders are more common in people with psychosis (predominantly schizophrenia and bipolar disorder) than in the general population. People with psychosis commonly take various non-prescribed substances to cope with their symptoms. Among people with psychosis, those with coexisting substance use have a higher risk of relapse and admission to hospital, higher mortality and higher levels of unmet needs. This is partly because the substances used may exacerbate the psychosis or interfere with pharmacological or psychological treatment.

A person experiencing psychosis who is using substances presents diagnostic and management challenges for the clinician. It is important to differentiate between three different phenomena with regard to psychosis and substance use disorders:

- Substances can precipitate a psychotic disorder in predisposed individuals which can persist in the absence of the psychoactive substance.
- Some people have an underlying psychotic disorder that is exacerbated by concurrent use of substances, in particular cannabis and amphetamines.
- People can experience an acute psychotic episode in response to substance intoxication or withdrawal; this is also called substance-induced psychosis.

Schizophrenia

Comorbidity of schizophrenia and any substance use disorder is common, with rates as high as 30–66 % (Green, 2005). Among psychotic patients, in addition to cigarette smoking, the most frequent drugs of use and misuse are alcohol and cannabis and, more recently, cocaine. Moreover, a significant proportion of these subjects use different substances over their lifetime, sometimes simultaneously (Barkus and Murray, 2010; Green, 2005).

Clinically, there are few differences in acute symptoms between schizophrenia and substance-induced psychosis. A distinction is made primarily on the basis of resolution of symptoms after withdrawal from the substance. Prodromal, or early non-specific symptoms of schizophrenia, such as subtle personality changes, social withdrawal, reduced self-care and bizarre thinking, prior to the start of substance use and psychotic symptoms, may help make the distinction between schizophrenia and substance-induced psychotic symptoms.

Suggested reasons for increased substance use in schizophrenia are dominated by the self-medication hypothesis, which postulates that people use substances in an effort to deal with their symptoms. However, although those with substance use disorders and schizophrenia report fewer negative symptoms, self-medication does not explain all cases of comorbid substance use and schizophrenia.

Comorbid substance use and schizophrenia is associated with increased morbidity and poorer treatment outcomes than substance use disorders

alone. Even the moderate use of substances can exacerbate psychotic symptoms, which can make motivating the patient to reduce substance use more difficult. Substance use is strongly associated with treatment non-compliance and longer duration of untreated schizophrenia. Decreases in substance use owing to treatment retention are associated with reduced overall symptoms in people with psychosis (Green, 2005; Gregg et al., 2007; San et al., 2007a; Schmidt et al., 2011).

| Bipolar disorder

General population studies show that between 40 % and 60 % of those with bipolar disorder have a comorbid substance disorder. The use of large amounts of alcohol or other substances frequently occurs during the manic phase of bipolar illness. Manic symptoms are likely to be exacerbated by concurrent substance use, particularly stimulants and cannabis use. During the depressed phase of the illness, there is also increased substance use, with alcohol exacerbating depression, and the use of stimulants and cannabis potentially precipitating a manic swing or mixed-symptoms episode. During periods of recovery, the person typically returns to limited substance use. Care must be taken not to misdiagnose and attribute all problems to the substance intake. The presence of a substance use disorder seems to predict worse social adjustment and poorer outcome in bipolar patients (Jaworski et al., 2011).

| Psychosis and cannabis use disorders

One of the most commonly used substances by individuals with psychosis is cannabis, and individuals with schizophrenia or bipolar disorder quite often receive an additional diagnosis of cannabis dependence (Green and Brown, 2006; Green, 2006; Wittchen et al., 2007). Associations between cannabis and psychosis can vary, as follows:

- Cannabis can induce or cause a temporary psychotic state that clears within several days in individuals with no prior diagnosis of psychosis.
- Cannabis can trigger psychosis in individuals who are at risk of psychosis.
- Cannabis can worsen psychotic symptoms in those individuals who have a current diagnosis of psychosis.

Furthermore, cannabis use is associated with an earlier onset of psychosis (Tosato et al., 2013) and an increasing inpatient readmission risk in first-episode psychotics (Batalla et al., 2013). People with psychosis generally do not use cannabis in a self-medicating manner to reduce psychotic symptoms. Reported reasons for use include social isolation, lack of emotion or feeling for others, lack of energy, difficulty sleeping, depression, anxiety, agitation, tremors or shaking and boredom. These symptoms may occur as part of the psychotic illness or may be due to additional anxiety or depressive illnesses or to the side effects of medication.

People with psychotic disorders should avoid cannabis and be counselled against its use. Brief interventions should be offered for people with psychosis who may be using even small amounts of cannabis. In an acute psychotic episode caused by cannabis use, cessation of use will result in the resolution of the episode. Duration of cannabis use in people with bipolar disorder is associated with the duration of mania.

| Psychosis and opioid use disorders

The prevalence of comorbid psychosis and opioid use is generally low (4–7 %). This low prevalence might be explained by the antipsychotic effect of opioids. Previous studies have shown a direct involvement of opioid neuropeptides in the physiopathology of psychotic disorders and antipsychotic pharmacological properties, including antipsychotic effectiveness, of opioid agonists (Maremmani et al., 2014).

| Psychosis and stimulant use disorders

One of the most serious comorbidities with stimulant (cocaine, amphetamines) use disorders is the presence of psychotic symptoms. In addition, stimulants are among the most commonly used substances in individuals with psychosis.

In drug use clinical settings, psychotic symptoms have been found to occur in between 12 % and 86 % of cocaine-dependent patients (Araos et al., 2014; Roncero et al., 2012, 2013; Vergara-Moragues et al., 2012; Vorspan et al., 2012).

Cocaine and amphetamines can induce or precipitate psychotic states. Stimulant-induced psychosis can often be indistinguishable from acute or chronic schizophrenia (Fiorentini et al., 2011; Maremmani et al., 2015). The psychotic symptoms in stimulant users can be classified as:

- Expected effects of the intoxication of stimulants (e.g. delusions and hallucinations).
- Substance-induced psychotic disorders: stimulant misuse has been associated with prominent brief positive and negative psychotic symptoms even in a healthy control group. A large dose of stimulant can produce a brief psychotic disorder. This diagnosis should be made instead of a diagnosis of substance intoxication only when the symptoms are sufficiently severe to warrant independent clinical attention. The criteria to differentiate between substance-induced psychotic disorders and substance intoxication include the duration of symptoms, their severity and whether or not hallucinations occur in the absence of intact reality testing. Longer and heavier use of stimulants delays recovery and worsens the prognosis for stimulant-induced psychosis. However, the repetitive use of stimulants may cause prolonged psychotic states that can last up to several months after cessation of use. Clinically, stimulant-induced psychosis involves both positive and negative symptoms, including paranoid hallucinatory (auditory and visual) states and bizarre ideas, as well as volitional disturbances, and can often be indistinguishable from acute or chronic schizophrenia. After complete recovery, the acute reappearance of paranoid states or relapse into psychosis can be induced by a single use of a stimulant in people with a history of stimulant-induced psychosis, even years after the initial psychosis has been resolved.
- Psychosis with stimulants use: the use of cocaine or amphetamines by a bipolar or schizophrenic patient. People with an established psychotic disorder can experience an exacerbation of symptoms after acute exposure to stimulants, possibly owing to an increase in monoamines.

Psychosis and inhalant use disorders

Chronic inhalant use can produce persistent psychotic symptoms in susceptible individuals. Chronic inhalant use also has the potential to induce psychotic symptoms in those who are not susceptible to psychosis. Inhalant use can induce a brief psychotic disorder that can last from a few hours up to a few weeks beyond the time of intoxication (Fiorentini et al., 2011; Maremmani et al., 2015).

Treatment recommendations

Currently available guidelines for the treatment of psychosis unanimously call for the use of antipsychotic

drugs as a crucial element (NICE, 2011). For the correct and effective use of antipsychotic drugs in treating comorbid patients, certain considerations must be taken into account (Green et al., 2008; Wobrock and Soyka, 2009). When prescribing medication, the following factors are important:

- The level and type of substance misuse should be recorded, as this may alter the metabolism of prescribed medication, decrease its effectiveness and/or increase the risk of side effects (including increases in substance use).
- The patient should be warned about potential interactions between substances of misuse and prescribed medication.
- The problems and potential dangers of using non-prescribed substances and alcohol to counteract the effects or side effects of the prescribed medication should be discussed.

There is little difference between schizophrenia and substance-induced psychosis with regard to the treatment of acute symptoms. However, substance-induced psychosis does not normally require long-term maintenance with antipsychotic medication. Despite a lack of controlled trials, it appears that people with comorbid substance use and schizophrenia fare better on atypical than typical antipsychotics. Clozapine stands out as the most valuable treatment so far for comorbid substance use and schizophrenia, and there is evidence of its effectiveness in controlling both psychotic symptoms and reducing substance use in those with psychosis. Furthermore, some studies have suggested that typical antipsychotics may even worsen substance abuse in dual diagnosis patients (Green et al., 2008).

Although there is little research assessing the management of opioid use and psychosis, those with psychosis who participate in methadone treatment do not appear to experience any more side effects than those without comorbid psychosis, and they may benefit from opioid maintenance therapy. Although there have been no studies to assess the impact on psychosis treatment compliance, combined daily dispensing of psychotropic medication at the same time as daily dispensing of opioid maintenance pharmacotherapy may improve treatment compliance for the psychotic disorder. If antipsychotic drugs are needed, atypical antipsychotic drugs are recommended. The use of classical antipsychotic drugs in opioid dependence can increase side effects such as extrapyramidal syndrome and prolongation of the corrected QT interval.

Furthermore, integrated care for both disorders (including pharmacotherapy, motivational interviewing, CBT and caregiver interventions) significantly improves both 'positive' psychotic symptoms and substance use (San et al., 2007b).

Personality disorders and substance use disorders

Substance use is often associated with a personality disorder. Antisocial and borderline personality disorders are the most frequent among illicit drug users. In a recent Norwegian study, 46 % of the substance use disorder patients had at least one personality disorder (16 % antisocial, males only; 13 % borderline; and 8 % paranoid, avoidant and obsessive–compulsive) (Langås et al., 2012a).

Subjects with this comorbidity have more problematic symptoms of substance use than those without a personality disorder. In addition, they are more likely to participate in risky substance-injecting practices and to engage in risky sexual practices and other disinhibited behaviours, which predispose them to blood-borne virus infections and other medical and social complications (e.g. illicit behaviours). Furthermore, they may have difficulty staying in treatment programmes and complying with treatment plans, although treatment for substance use in people with personality disorders is associated with a reduction in substance use and also a reduction in the likelihood of being arrested.

A sizeable share of those with opioid dependence also have a personality disorder. Opioid-dependent people with a personality disorder have more severe substance dependence, as well as polydrug dependencies, participate in more criminal activities (which are probably related to the procurement of drugs), exhibit more risky injecting behaviour, have higher rates of suicidality and overdose, and have more psychological distress than opioid-dependent individuals without personality disorders. Interestingly, the presence of a personality disorder does not appear to have an impact on the effectiveness of opioid treatment; however, it may affect retention and result in continual switching between treatment regimes. Treatment reduces participation in crime, risk of overdose and psychological distress and improves injecting behaviour, but whether or not it reduces the risk of suicide is not clear (Havens et al., 2005; van den Bosch and Verheul, 2007).

Treatment recommendations

The most important recommendation for treatment is that patients with personality disorders can be offered the same range of treatment options as patients without personality disorders. Nevertheless, high-risk behaviour may persist in patients with borderline personality disorder despite successful treatment of the substance use disorder, and such patients should also be given treatment aimed at ameliorating the impact of the personality disorder. There is no evidence that any pharmacotherapy is particularly beneficial in the comorbidity of personality disorder with substance use disorders (Lingford-Hughes et al., 2012).

Attention deficit and hyperactivity disorder and substance use disorders

In recent years, there has been increasing interest in the comorbidity of attention deficit and hyperactivity disorder and substance use. A recent study carried out in France, Hungary, the Netherlands, Norway, Spain, Sweden and Switzerland found a prevalence of adult attention deficit and hyperactivity disorder in substance users seeking treatment ranging from 5 % to 8 % in Hungary to 31 % to 33 % in Norway, depending on the diagnostic criteria used (DSM-IV versus DSM-5) (van de Glind et al., 2014). Comorbidity patterns differed between attention deficit and hyperactivity disorder subtypes, with increased major depression in the inattentive and combined subtype, increased hypomanic episodes and antisocial personality disorder in the hyperactive/impulsive and combined subtypes, and increased bipolar disorder in all subtypes (Cuenca-Royo et al., 2013; van Emmerik-van Oortmerssen et al., 2014).

Treatment recommendations

As for other psychiatric disorders, establishing a diagnosis of attention deficit and hyperactivity disorder can be complicated in the context of ongoing substance use, because the acute and prolonged effects of psychoactive substances may affect concentration capacity. However, delaying adequate treatment of co-occurring attention deficit and hyperactivity disorder may compromise a patient's treatment outcome (Levin et al., 2008; Wilens and Biederman, 2006). Stimulants are commonly recommended for the treatment of childhood attention deficit and hyperactivity disorder; however, concerns that childhood use of prescribed stimulants may predispose an individual to a future

substance use disorder are unsubstantiated (Barkley et al., 2003). Recent data indicate that childhood stimulant therapy may lower the risk of developing a concurrent alcohol or drug use disorder during adolescence and adulthood (Kollins, 2008; Wilens et al., 2008). Despite this, the risk for misuse or diversion of prescribed medications has to be carefully considered. Finally, alternative attention deficit and hyperactivity disorder pharmacotherapies without an abuse potential should be evaluated, such as atomoxetine or bupropion (Wilens and Biederman, 2006).

Eating disorders and substance use disorders

There is strong evidence to demonstrate that eating disorders and substance use disorders tend to co-occur. The prevalence of drug and alcohol abuse is approximately 50 % in individuals with an eating disorder, compared with approximately 9 % in the general population. Similarly, among individuals with a substance use disorder, over 35 % report having an eating disorder; this is in contrast to the prevalence of 1–3 % reported in the general population (Krug et al., 2008; Salbach-Andrae et al., 2008).

The prevalence of substance use disorders differs across anorexia nervosa subtypes: people with bulimia or bingeing/purging behaviours are more likely to use substances or have a substance use disorder than people with anorexia (in particular the restricting type) or the general population (Root et al., 2010a, 2010b). Results from studies of bulimia and anorexia populations suggest that those individuals who use pharmacological methods of weight control (including laxatives, diet pills and diuretics) are more likely to use substances such as stimulants (Corte and Stein, 2000).

A type of eating disorders has been described in which some people have difficulty with 'multi-impulse control' (Lacey and Evans, 1986). Such people are more prone to problems in a variety of areas of impulse control within the context of their bulimic illness, including substance use. People with comorbid bulimia and substance use problems are more likely to attempt suicide, be impulsive and have a personality disorder (Fischer and Le Grange, 2007; Haug et al., 2001; Sansone and Levitt, 2002; Wiederman and Pryor, 1996). The risk of people with

eating disorders developing a substance use disorder continues over time and should be part of the ongoing assessment of these individuals (Fischer and Le Grange, 2007; Franko et al., 2005; Herzog et al., 2006; Piran and Gadalla, 2007). Eating disorders are more prevalent among users of stimulants, particularly amphetamine, cocaine and ecstasy (Curran and Robjant, 2006; Martín-Santos et al., 2010).

Practitioners should always anticipate mental disorders and substance use comorbidity in people with eating disorders (Blinder et al., 2006; Herzog et al., 2006), particularly those with bingeing/purging types.

The disruptive symptoms of eating disorders can interfere with therapy for substance use disorders (Franko et al., 2005) and vice versa. When assessing people with eating disorders, a detailed drug history should be elicited and should include specific inquiries about alcohol and stimulant use as well as diuretic, laxative and thyroxine use.

Treatment recommendations

There is a paucity of evidence relating to the management of co-occurring eating disorders and substance use disorders. Overall, the literature indicates that co-occurring eating disorders and substance use disorders should be addressed simultaneously using a multidisciplinary approach. The need for medical stabilisation, hospitalisation or inpatient treatment needs to be assessed based on general medical and psychiatric considerations. Features common across therapeutic interventions include psycho-education regarding the aetiological commonalities, risks and sequelae of concurrent eating disorder behaviours and substance abuse, dietary education and planning, cognitive challenging of eating disorder attitudes and beliefs, building of skills and coping mechanisms, addressing obstacles to improvement and the prevention of relapse. Emphasis should be placed on building a collaborative therapeutic relationship and avoiding power struggles. CBT has often been used in the treatment of comorbid eating disorders and substance use disorders; however, there have been no randomised controlled trials. More recently, evidence has been found for the efficacy of dialectical behavioural therapy in reducing both eating disorders and substance use disorders (Gregorowski et al., 2013).

Summary

Psychiatric comorbidity among patients with substance use disorders is common, with different prevalence figures for different combinations of psychiatric disorders and substance use disorders. The specific clinical aspects of the more common combinations of psychiatric comorbidity (mood, anxiety, psychotic, attention deficit and hyperactivity, eating and personality disorders) and substance use disorder (opioids, stimulants, cannabis) are discussed. The psychiatric comorbidity has a greater impact on clinical severity,

psychosocial functioning and quality of life of patients with substance use disorders. The therapeutic approach to tackle dual diagnosis, whether pharmacological, psychological or both, has to take into account both disorders from diagnosis in order to choose the best option for each individual. Optimal management requires a good understanding of the efficacy, interactions and side effects of pharmacological and psychological treatments. Further studies are needed to improve the evidence base for treatments in these comorbid patients.

CHAPTER 6

Treatment services for the comorbidity of substance use and mental disorders

Overview

Despite the relevance of providing effective treatments for psychiatric comorbidity in substance use disorder patients, there is still a lack of consensus regarding the most appropriate treatment setting and pharmacological and psychosocial strategies. These patients often have difficulties not only in identifying but also in accessing and coordinating the required mental health and substance abuse services. Data provided by the Substance Abuse and Mental Health Services Administration (2011) indicate that in the United States, only 44 % of patients with dual diagnosis receive treatment for either disorder, and a mere 7 % receive treatment for both disorders. Establishing optimum care strategies, including where the treatment should take place (mental health facilities, substance abuse treatment facilities) and how best to treat these patients, is one of the biggest challenges facing policymakers, clinicians and professionals in the coming years.

Recently, Ness et al. (2014) reviewed the literature dealing with facilitators and barriers in dual recovery according to the opinion of patients with co-occurring mental health and substance use disorders. The overarching themes identified as facilitators of recovery were having a meaningful everyday life (e.g. playing sports, occupying time with interests that patients enjoy), focusing on strengths (e.g. retaining a sense of humour about their experiences) and future orientation, and re-establishing a social life and supportive relationships (e.g. taking responsibility for themselves and others). However, the most important reported barriers to dual recovery were the lack of tailored help (e.g. lack of acceptance of relapse) and complex and uncoordinated systems.

Difficulties in treating these patients are mainly related to the fact that in most countries, in addition to the general healthcare services (such as community health facilities, general hospitals), there is a separation of

mental health and drug use treatment networks. This differentiation in treatment facilities (i.e. drug use centres and mental health centres) is itself a barrier to the achievement of appropriate treatment services for patients with comorbid disorders (Ness et al., 2014). Other difficulties are related to the fact that treatment services may lack sufficient combined expertise to treat both types of disorders (Sacks et al., 2013). In addition, treatment philosophies, regulations or even financial resources may contribute to the difficulties in the treatment of these dual diagnosed patients (Burnam and Watkins, 2006).

Three models of service use have been tried to date: sequential, parallel and integrated (see the box on p. 58).

In the sequential model, patients first receive treatment for one problem, while treatment for the other problem is deferred until the first is at least stabilised. Here, the mental health and drug use treatment networks remain independent and separate, and the only link between the two care providers is when a patient is referred from one to the other. However, even this minimal link is sometimes broken, thereby increasing the risk of patient dropouts. A more significant problem is that because co-occurring disorders are reciprocally interactive, the sequential treatment of one disorder at a time not only leaves the comorbid problem untreated but also limits the effectiveness of the treatment itself. The interaction between substance abuse disorders and other psychiatric disorders would explain the high rates of relapse seen in relation to both, which inevitably leads to frustration among patients and the care providers involved in the process. As a result, it is now agreed that the sequential model should not be used when dealing with dual diagnosis patients (Burnam and Watkins, 2006).

In the parallel model, simultaneous treatments are provided for the two problems (e.g. addiction and other psychiatric disorder) by two distinct, often separate

services. Although some kind of integration between the two systems may be achieved, philosophical differences remain between the providers of drug use treatment services and mental health services. Furthermore, policy and organisational issues often prevent effective cooperation between professionals, and patients may not even be referred for one of the co-occurring disorders or may be excluded from services in the other system. The unfortunate consequence of this is that the responsibility for choosing and following a coherent care plan falls mainly on the patient (Burnam and Watkins, 2006; Drake et al., 2001). The potential problems faced by drug users when seeking to access psychiatric care are mainly related to uncertainty about the effectiveness of available support, poor coordination of appointments, logistical problems in reaching the care provider's location, stigma and negative staff attitudes towards drug use and the presumed criminal behaviour of drug users (Neale et al., 2008).

In the integrated model, both the psychiatric disorder and the substance use are addressed through simultaneous, integrated and ongoing programmes (Drake et al., 2005). The integrated model envisages a global treatment plan tackling both mental health disorders and substance abuse disorders, which would be provided simultaneously by a multidisciplinary team. The use of shared treatment plans can help not only to minimise philosophical differences among providers but also to ensure that the substance abuse and psychiatric illness are accurately diagnosed and targeted for a stage-specific treatment. Unfortunately, however, the traditional division between mental health and substance-user care systems is proving hard to overturn (Burnam and Watkins, 2006), and considerable efforts are still required in order to implement a viable, integrated and effective treatment process and system for comorbid patients (Magura, 2008).

Treatment structures

The international literature describes three service delivery models for the treatment of comorbidity:

Sequential or serial treatment: psychiatric and substance disorders are treated consecutively and there is little communication between services. Patients usually receive treatment for the most serious problems first, and, once this treatment is completed, they are treated for their other problems. However, this model may also lead to patients being passed between services, with no service being able to meet their needs.

Parallel treatment: treatment of the two different disorders is undertaken at the same time, with drug and mental health services liaising to provide services concurrently. The two treatment needs are often met with different therapeutic approaches and the medical model of psychiatry may conflict with the psychosocial orientation of drug services.

Integrated treatment: treatment is provided within a psychiatric or a drug treatment service or a special comorbidity programme or service. Cross-referral to other agencies is avoided.

Treatments include motivational and behavioural interventions, relapse prevention, pharmacotherapy and social approaches.

The actuality of comorbidity treatment in the European Union, as described in the national reports, is not easily categorised into these three groups. Integrated treatment is seen as the model of excellence, but it is a standard that is difficult to achieve. Relevant research usually comes from outside Europe. The Australian National Comorbidity Project (Commonwealth Department for Health and Ageing, 20053) has concluded from a literature review that approaches to the management and care of comorbidity clients have not been studied systematically or evaluated rigorously, partly because of the difficulty of studying people with coexisting mental illness and substance abuse disorder, because of their irregular lifestyle, among other reasons. Another review concluded that there is evidence that integrated treatment for people with dual diagnosis is beneficial to both mental health and substance use outcomes (Drake et al., 1998). Only one study compared integrated with parallel approaches, but did not find any significant difference, and no study compared integrated and sequential approaches.

Although integrated treatment has been promoted as a way of diminishing the fragmentation, duplication and risk of ‘falling between the gaps’ arising from sequential or parallel treatment models, the evidence is limited and usually based on approaches from North American studies, which are contextually different from European healthcare systems (Baldacchino and Corkery, 2006; Moggi et al., 2010). Most of the studies of integrated treatment in European countries have been undertaken in patients with severe mental illness and a substance use disorder (Craig et al., 2008; McCrone et al., 2000). In a recent study in Norway, it was demonstrated that integrated treatment is effective in increasing the motivation for treatment among patients in outpatient clinics with anxiety or depression together with a substance use disorder (Wüsthoff et al., 2014). Some countries, such as Finland, Italy, the Netherlands, Norway and Spain, have special facilities, including acute inpatient dual diagnosis units; dual diagnosis residential communities; and dual diagnosis programmes in both mental health and drug user outpatient centres. These all represent attempts to move towards a more integrated model of treatment.

This chapter summarises a review of data from all national reports from 2006 to 2013 (Reitox national focal points), some European key informants in the field of addictions, grey literature and the literature review conducted in Medline. Overall, there are many differences in approach, not only between European countries but also between different regions of the same country. In some cases, specific data about treatment services for comorbid substance use and mental disorders have been found, whereas in others, only a general approach is provided. Furthermore, rapid changes in this field are occurring. An overview of the present available information on the different European countries is summarised below.

| Austria

Addiction treatment services are provided both by specialised centres and as part of general healthcare services (e.g. psychiatric hospitals, psychosocial services and office-based medical doctors). They provide a range of options and can be flexibly applied to respond to a client’s treatment and social needs. The treatment programmes are offered in modular form, providing both short- and long-term options. Treatment is mostly provided on an outpatient basis, and the majority of the outpatient facilities are counselling centres. Although counselling centres treat users of both licit and illicit drugs, there are several specialised treatment and reintegration facilities available almost exclusively for

illicit drug users. Outpatient psychosocial interventions cover a range of services, such as counselling, outreach work, psychotherapy and aftercare and reintegration programmes. Inpatient psychosocial interventions are provided in both specific and generic facilities, offering short- and long-term treatment, often combined with inpatient detoxification. Specific target groups for treatment service providers are immigrants, pregnant women, young people, older drug users and individuals with psychiatric comorbidity. For these groups, service providers have focused their work on improving treatment access or programme implementation.

| Belgium

Over the past 15 years, clinicians have noted increasing numbers of patients with dual diagnoses. A pilot project called ‘Intensive treatment of patients with dual diagnosis’ started in two Belgian hospital units (one in Flanders and one in Wallonia) in 2002. In the first 10 years, 10 beds were available in each of the two hospital units. Since 2013, both units enlarged their capacity to 15 beds in order to meet the needs of this target group. These units are staffed to the level of 17 full-time equivalents, among which there are three psychologists. Since 2005, the units have also had a case manager in order to guarantee continuity of care. In 2014, a total of 94 patients were admitted to these two units. Patients entering these units have to have a substance use problem in combination with a psychotic disorder, although they cannot be mentally limited (intelligence quotient < 65) or have chronic pathologies. The objective is to stabilise the patient and to refer him or her to another ambulatory or residential setting after a period of six months (this may potentially be prolonged for another six months). The medical team has developed a specific expertise in this field, which makes these units a reference point for the treatment of patients with dual diagnosis. A research team from the University of Antwerp conducted an evaluation of this pilot project. The research team estimated there to be up to 2 800 people with dual diagnoses in Belgium. They recommended a prolongation of this pilot project and the development of an official structural anchor. Nevertheless, they criticise the lack of care and supervised housing structures for these patients and also point out the lack of rehabilitation possibilities for these patients. Consequently, they recommend an intensive and integrated approach based on case management and outreach. In addition, they recommend a specific approach concerning polydrug use. Currently, other institutions are developing similar types of treatment programmes.

| Bulgaria

Drug-related treatment is mainly delivered by a combination of public and private institutions. As a general rule, clients do not pay for treatment received in public institutions, whereas clients in private establishments pay for the services they receive. Medically assisted treatment, which includes inpatient and outpatient detoxification, opioid substitution treatment and psychosocial rehabilitation programmes, such as therapeutic communities, day-care centres, are available in Bulgaria. Drug treatment is provided by 12 state psychiatric hospitals, 12 regional mental health centres, 16 psychiatric wards of multiprofiled hospitals offering active treatment and five psychiatric clinics at university hospitals. Non-governmental organisations (NGOs) mainly provide psychosocial services through day-care facilities.

| Croatia

The central element of the Croatian drug treatment system is the provision of care through outpatient treatment facilities, although hospital-based inpatient treatment facilities and seven therapeutic communities are also available. There are 33 inpatient treatment centres and 23 outpatient treatment centres across Croatia. Outpatient treatment is organised through a network of services for mental health promotion, addiction prevention and outpatient treatment in county public health institutes. These services cover individual and group psychotherapy, prescriptions and continuation of opioid substitution treatment and other pharmacological treatments, as well as testing and counselling on a wide range of issues. Inpatient treatment is provided by hospitals and covers detoxification, adjustment of pharmacotherapy, drug-free programmes, and individual and group psychosocial treatment. Teams of general medicine physicians cooperate closely with specialised treatment programmes, in particular on the continuation of opioid substitution treatment.

| Cyprus

A service designed specifically for treating patients with dual diagnoses is not available in Cyprus. However, although treatment services do not accept patients with active comorbidity, most of them treat patients with non-active comorbidity, mainly by psychological interventions (one-to-one sessions) and, if needed, by psychiatric treatment. Drug treatment is delivered by both governmental organisations and NGOs. The

treatment system consists of counselling, rehabilitation, detoxification, substitution centres, self-help groups and one drop-in centre. All outpatient and inpatient programmes use psychosocial interventions as their primary treatment tool. Counselling centres mainly focus on motivational enhancement and support, whereas inpatient and outpatient rehabilitation programmes, including a therapeutic community, focus on individual and group counselling, therapy and psychotherapy and social reintegration. Centres for adolescents and young people also focus on family interventions. Most programmes provide services to drug users regardless of the substance being used. Only two programmes (one inpatient and one outpatient) target problem drug users.

| Czech Republic

Drug treatment is delivered through low-threshold programmes, inpatient and outpatient drug treatment centres and psychiatric hospitals, detoxification units, opioid substitution treatment units, therapeutic communities and aftercare programmes. Addiction treatment is delivered both by public organisations and by NGOs. It is also delivered, to a lesser extent, by private institutions, which provide three main treatment types of services: detoxification, outpatient care and institutional care. A discussion on a psychiatric care reform strategy 2014–20, led by the Ministry of Health, is ongoing in the Czech Republic, and aims to shift the Czech psychiatric treatment system towards community-type care and to introduce flexibility for service provision based on regional needs and priorities, although the reform excludes care of patients with addictive disorders. In parallel, a new concept of a network of specialised medical addiction treatment services was adopted by the Society for Addictive Diseases of the Czech Medical Association. In 2012–13, revision of the standards of professional competency for all types of drug services continued at the national level. Special facilities designed specifically for treating patients with a dual diagnosis do not exist generally in the Czech Republic; however, the treatment of comorbid substance use and mental disorders is an integral part of both specialised medical as well as non-medical addiction treatment services, and some existing facilities provide special programmes for clients with dual diagnoses.

| Denmark

The main goals of Danish drug treatment policy are to achieve a reduction in drug use, to reduce drug-related deaths, to achieve full abstinence through enhanced use

of psychosocial interventions and systematic follow-up of treatment, including substitution treatment. Following local government reform in 2007, municipalities became responsible for organising both the social and medical treatment of drug users, and these regions are responsible for psychiatric, primary and public healthcare. Clients are usually treated as outpatients, and this may be supplemented by day or inpatient treatment if a change in environment or a more structured intervention is needed. The most prevalent approaches to treatment are cognitive, socio-educational and solution-focused. Several initiatives have been taken to address socially marginalised drug users and drug users with concurrent mental disorders, and underage youth are also supported. Patients with comorbidity and complex social issues are, in accordance with the regional health plans, recommended to get a so-called coordinated treatment plan, which is meant to coordinate different services within the local drug treatment and regional psychiatric treatment contexts.

In 2013, a total of 5 547 people were admitted to psychiatric hospitals with a drug-related primary or secondary diagnosis (comorbidity). There are specific outpatient treatment programmes and teams for patients with comorbidity.

| Estonia

Traditionally, drug treatment in Estonia is mostly provided through hospitals, which obtain a licence for mental health services in order to provide inpatient and outpatient treatment for problem drug users. The Estonian Mental Health Act (RT I 1997, 16, 260) states that only a psychiatrist can provide drug treatment, although they are not required to be specialists in drug treatment. In general, outpatient treatment dominates, and inpatient treatment services remain limited.

Special drug treatment programmes for children and adolescents and individuals with dual diagnoses are also available, although treatment options for these groups remain limited.

| Finland

In Finland, there have been increased attempts during the past 5–6 years to improve the provision of adequate treatment in primary health or social care for persons with substance abuse problems and co-occurring psychiatric problems. We do not, however, have a comprehensive national picture of the extent and nature

of treatment provision for persons with problematic drug use and simultaneous psychiatric problems. As the treatment system is very decentralised, with the main treatment responsibility at the municipal level (about 300 municipalities), the supply of treatment for comorbid substance use and mental disorders varies both in extent and in terms of provider organisation from municipality to municipality. Some municipalities have created new dual-competence units or staff under a primary healthcare umbrella. Some have strengthened the substance abuse treatment units (within the social care organisation) with psychiatric expertise. Others have moved the substance abuse treatment under a psychiatry administration and included specialised psychiatric treatment. A study of the integration of substance abuse treatment (not especially drug use) and mental health care in eight municipalities showed that administrative integration did not correlate with clinical competence to treat dual diagnoses. Approximately 50 % of intoxicant-related disorders diagnosed in the entire social and healthcare system also have known mental health problems. The prevalence of dual diagnoses does not correlate with administrative integration reforms.

Individuals with problematic drug use are more likely than individuals with alcohol-related problems to have regular contacts with the healthcare system. A dual diagnosis or a potential dual diagnosis is one of the criteria for treatment in a specialised healthcare facility. These 'substance use disorder psychiatry' inpatient and outpatient units are referred to as dual diagnosis facilities in Table 6.1.

| France

In France, drug treatment is mainly provided via a specialised addiction treatment system operating within medico-social establishments, and a general care system comprising hospitals and general practitioners. Some care is also provided through a risk-reduction system. The provision of treatment to drug users falls under the jurisdiction of the regional and local authorities. Almost all of the administrative areas across France have at least one specialised addiction treatment support and prevention centre. These centres provide three types of services: (1) outpatient care; (2) inpatient care (including therapeutic communities); and (3) treatment for prison inmates. Both pharmacologically assisted and psychosocial treatments are provided in the same centres. The general addiction care system through hospitals is organised on three levels, with each new level building on services available in the previous level. First-level care manages withdrawal and organises

consultations; second-level care adds the provision of more complex residential care; and third-level care expands the services to research, training and regional coordination. No specialised treatment centres for drug patients with other psychiatric diagnoses are reported. However, parts of the specialised centres mentioned above are nested into specialised psychiatric hospitals or the psychiatric departments of general hospitals. Although not labelled as dual diagnosis treatment facilities, these centres are more specifically qualified to deal with dual diagnosis patients.

Germany

Drug users who, in addition to their drug problems, have psychiatric disorders that require treatment depend in a special way on the general diagnostic competences of addiction therapists in the field of psychological disorders and, at the same time, require cooperation between clinical psychology or psychiatry and addiction treatment that is appropriate to tackle both types of problem. In practice, it seems that there are two ways of dealing with these problems: either the two problem areas are dealt with by two different therapists or institutions, which must closely coordinate their activities, or treatment is carried out at one place, although this requires competencies in both problem areas. In general, mixing these clients with other drug clients has not proven positive, as clients with dual diagnoses sometimes require a slower and more flexible therapeutic approach (e.g. regarding medication, keeping agreements, accepting set structures). It must also be highlighted that, in Germany, addressing dual diagnoses has become a topic of increasing importance during the past years. Institutions try either to broaden their competencies with regard to better qualifications for their own staff or to intensify their cooperation with psychiatric hospitals or specialised medical doctors and psychotherapists, for example.

Greece

In Greece, the provision of drug treatment is divided into the following categories: drug-free inpatient programmes; drug-free outpatient programmes; and substitution treatment units. With regard to special treatment programmes, one early intervention programme for cannabis users is integrated into a drug-free outpatient treatment unit for adolescents, and two specialised units for female users in prison are also available. The main theoretical models behind drug treatment programmes are medication-assisted treatment for opioid addicts, therapeutic communities,

systemic approaches and psychodynamic theory. Special dual diagnosis facilities are available in two drug-free treatment units.

Hungary

Special dual diagnosis facilities are not available in Hungary. As a result, patients are treated either in the drug inpatient or outpatient centres or by psychiatric services. However, addiction services are much more open for these patients as they are more likely to be treated in drug centres than in psychiatric facilities.

Ireland

The issue of dual diagnosis has presented challenges to treatment services in Ireland. A study undertaken by the National Advisory Committee on Drugs in 2004 found gaps in policy and practice in relation to the management of dually diagnosed people among service providers in both the mental health and addiction fields. A report by the Expert Group on Mental Health Policy ('A vision for change'), published in 2006 and currently being implemented on a phased basis, addressed the issue of dual diagnosis. This report states that the major responsibility for the care of people with addiction lies outside the mental health system. Mental health services for both adults and children are responsible for providing a mental health service only to those individuals who have comorbid substance abuse and mental health problems. General adult community mental health teams should generally cater for adults who meet these criteria, particularly when the primary problem is a mental health problem. The report also recommended that a specialist adult team be established in each catchment area of 300 000 of the population, to manage complex or severe substance abuse and mental disorders. These specialist teams should establish clear links with local community mental health services and clarify pathways in and out of their services to service users and referring adult community mental health teams.

The Health Service in Ireland is currently implementing an organisation-wide transformation programme towards a more client-centred continuum-of-care type service. This programme includes the roll-out, on a phased basis, of primary care teams and social care networks with a focus on integrated care pathways. It is proposed that the embedding of an integrated addiction service in this setting, which the Health Service in Ireland is currently undertaking, provides an opportunity to create the kind of service linkages that will better

address the existence of psychiatric comorbidity in substance misusers. However, they mention that there are difficulties in access to mental health services for people with comorbid addiction and mental health problems.

| Italy

Psychiatric disorders are increasingly associated with drug use in Italy and, although specific treatment for addiction has been offered for many years, the quality of treatment is still strongly influenced by the degree of cooperation between mental health services and hospital psychiatric wards. Because it is not always easy to distinguish precisely what the prevalent symptoms of a psychiatric disorder are and whether the psychiatric disorder is caused by substance abuse, is pre-existing or generally associated, difficulties arise when assigning patients to the relevant department.

Of the Italian regions, 80 % have specific inpatient and outpatient programmes for patients with dual diagnosis, but in only half of the cases is there a structured link between addiction services and mental health services, enabling therapeutic interventions to be coordinated. The SIMI-Italia data collection system, based on a sample of 2 000 patients attending the drug-treatment service (Servizi Tossicodipendenze, SerT), estimated that in 2006, 31 % of patients with a substance use disorder had a positive psychiatric diagnosis; three-fifths were men and 90 % reported current use of opioids. The strong presence of these patients has led, in public and private services, to a progressive improvement in diagnostic skills, thereby increasing the ability to detect and treat psychiatric symptoms and drug addiction. There are also some inpatient facilities (dual diagnosis units) available.

| Latvia

Drug treatment services are available in outpatient and inpatient clinics. In 2012, outpatient services were provided by 69 addiction specialists in 42 treatment institutions, whereas inpatient treatment was provided in specialised psychiatric hospitals and in regional and local multiprofile hospitals, which are either publicly or privately funded. In recent years, the number of inpatient service providers has decreased and, in total, nine treatment institutions have provided beds for the inpatient treatment of drug users. The outpatient services provide mainly psychosocial intervention, CBT, motivational interventions and long-term maintenance programmes, whereas inpatient facilities offer

emergency care for overdose cases, detoxification and short-term psychosocial interventions. Two specialised psychiatric centres provide long-term medical rehabilitation based on the principle of 'therapeutic community'.

| Lithuania

Drug treatment in Lithuania is provided mostly by public and private agencies. Outpatient drug treatment is provided by public mental health centres and by private medical institutions possessing a special licence. Furthermore, outpatient drug treatment is also provided in centres for addictive disorders. There are five regional, public, specialised centres for addictive disorders located across the country. Inpatient treatment, such as withdrawal treatment and residential treatment, is delivered by these specialised centres. In Lithuania in 2013, primary mental health care was implemented in 107 mental healthcare establishments. Mental health services provide treatment for patients with either psychiatric disorders or substance use disorders and for patients with dual diagnosis. Patients with dependence disorders who have developed severe abstinence-induced delirium or psychosis caused by psychoactive substances undergo treatment in public mental health centres or psychiatric hospitals.

| Luxembourg

All specialised drug treatment infrastructures in Luxembourg, general hospitals excluded, rely on governmental support and control. Treatment is decentralised and is most commonly provided by state-accredited NGOs. With the exception of detoxification departments, all treatment units or agencies accept any drug-using patient, irrespective of the types of substances that are involved. Detoxification treatment is provided by five different hospitals via their respective psychiatric units and is funded by health insurance. There are six specialist outpatient treatment facilities, one residential therapeutic community and one specialist psycho-medical inpatient transition unit.

| Malta

Drug treatment in Malta is delivered by the national agency against drugs and alcohol abuse, the Substance Misuse Outpatient Unit, the prison system and the Dual Diagnosis Unit, together with a special ward for female patients within Mount Carmel Hospital. Two NGOs (Caritas and the OASI Foundation), which are partially

funded by the government, also provide drug treatment in Malta. These treatment providers deliver different types of treatment, which can be classified into four main categories: outpatient community services; rehabilitation residential programmes; detoxification treatment; and substitution maintenance treatment.

| Netherlands

After an experimental phase, treatment options available for dual diagnosis patients have increased during the past few years. To date, there are several centres that focus on this target group. They deal with the use of any type of drug and mental health disorders, and treatment is adapted to many possible combinations of problems. A general guideline was published, but integrated treatments for this target group are still in development and their effectiveness is currently being studied. At inpatient level, psychiatric comorbidity can be treated in drug use facilities, in mental health units (mostly) and in dual diagnosis facilities.

| Norway

Treatment for drug use is integrated as a specialist area in all public hospitals. Some hospitals have dual diagnosis facilities but most integrate comorbid patients within the different existing substance units. A governmental advisory paper recommends that all substance use units should have, or develop, competency to treat milder mental health problems, such as anxiety and affective disorders, concurrently with personality disturbances, whereas the psychiatric units should have, or develop, competency to treat mild to moderate substance use disorders. Severe mental disorders such as psychotic states are always the responsibility of psychiatric units, which should have competency to treat substance use problems. Currently, these recommendations are only partly implemented, and different types of liaison services are expected to improve the situation. The authorities have decided on addiction medicine as a new specialty, and training systems are being developed. General health facilities handle comorbid patients within their ordinary workload and either treat within their capacity and competency or cooperate with mental health and drug use units. The system is essentially the same for inpatient and outpatient services. On a primary healthcare level, the comorbid patients have the right to a so-called 'individual patient plan' which is meant to coordinate different services, often by appointing a so-called responsibility team for each patient. These teams cooperate with those at the specialist healthcare level. A

new unit, the Norwegian National Advisory Unit on Concurrent Abuse and Mental Health Disorders, was established in 2012.

| Poland

Drug treatment services are provided through the network of inpatient and outpatient treatment centres, detoxification wards, day-care centres, drug treatment wards in hospitals, mid-term and long-term drug rehabilitation facilities and drug wards in prisons, and post-rehabilitation programmes. In territories in which there is no specialised drug treatment service, help can be obtained from mental health counselling or alcohol rehabilitation clinics. Some drug rehabilitation clinics specialise in comorbidity therapy. The first such clinic was established by the Family Association in 1998. Since that time, a few new specialist entities have been set up. However, the number of centres specialising in this type of therapy is insufficient, despite the fact that dual diagnosis is relatively uncommon in Poland (occurring in about 8 % of drug users in treatment). The number of dual diagnosis drug rehabilitation facilities is low (two or three services)

| Portugal

In Portugal, care for citizens with substance use disorders and related co-occurring psychiatric disorders is delivered in accordance with an all-encompassing referral/articulation network. This network regulates the offer of services to citizens with addictive behaviours or dependencies provided by public and private (profit and non-profit) institutions in all fields concerning this phenomenon, for example health, social security, justice, law enforcement and education, taking into account the citizen and the full extent of his or her biopsychosocial needs as well as the degree of severity of his or her addictive behaviours or dependencies. The provision of integrated and continuous care accords with the disease model, which sees addiction as a disease of the brain, that is, a chronic and relapsing condition frequently entailing co-occurring biopsychosocial disruption. Care provided through the network is organised in three levels: Level I (primary care services); Level II (specialised care, mainly in outpatient settings); Level III (differentiated care within substance use disorder-spectrum disorders, mainly in inpatient settings, such as detoxification units, treatment centres, day-care centres or specialised mental or somatic healthcare).

Within this framework, treatment for substance use disorder patients with co-occurring psychiatric disorders

is provided in accordance with the integrated model of care (interventions simultaneously address the substance use disorder and the psychiatric disorder), either by Level-II services (specialised addictive behaviours and/or dependencies treatment units) in cases where the co-occurring psychiatric disorder is of mild to moderate severity, or by Level-III services, when the severity of the co-occurring psychiatric disorder is of greater magnitude (referral to specialised psychiatric services), when an acute episode of the co-occurring mild to moderate psychiatric disorder is triggered (admission to a public or private inpatient unit), or when a referral to treatment centre inpatient programme is required.

| Romania

The drug treatment system in Romania has three levels of assistance and care. Level 1 is the main access path to the health system; it identifies, attracts, motivates and refers drug users to specialised assistance services consisting of primary healthcare services, social services, resources for the development of harm reduction programmes and emergency units, and may be implemented by public, private or mixed organisations or NGOs. Level 2 consists of specialised units of the public health system and centres for prevention, evaluation and counselling. The National Antidrug Agency provides specialised care, monitoring and referral to the third level, thereby ensuring the necessary coordination between all levels of intervention. This is the central point of the whole welfare system. Level 3 provides specific interventions for social reinsertion and highly specialised services that support Level-2 services, consisting of hospital rehabilitation resources, residential resources, therapeutic communities, among others. It is implemented by public, private or mixed organisations or NGOs.

| Slovakia

In Slovakia, drug treatment is mainly delivered through five public specialised centres for treatment of drug dependencies, mental outpatient clinics, psychiatric hospitals and psychiatric wards at university hospitals and general hospitals. The distinctive features of the Slovak drug treatment services are close links to mental health services and integration with treatment services for alcohol addiction, which allows mental health issues among drug users and issues related to polydrug use to be addressed.

Centres for treatment of drug dependencies, which are specialised psychiatric institutes, are the main providers of all types of specialised drug treatment, whereas the mental outpatient clinics, available nationwide, offer outpatient diagnostic services, detoxification and long-term opioid substitution treatment. Residential drug treatment is delivered in inpatient departments, at specialised dependency treatment departments of psychiatric hospitals, and in centres for treatment of drug dependencies.

| Slovenia

In Slovenia, the outpatient treatment of psychiatric comorbidity among substance users may be provided in drug use services and in mental health services, as well as in certain services that provide treatment for either mental or substance use disorders and for dual diagnoses. At inpatient level, psychiatric comorbidity is treated in drug use facilities or dual diagnosis facilities.

| Spain

In Spain, although there are differences among the different autonomous communities (regions), there is a 'Drug abuse treatment network', with community centres, specific detoxification units located in general hospitals and therapeutic communities, and a 'Mental health treatment network', also with community centres, acute units for hospitalisation in general hospital and psychiatric hospitals, and rehabilitation units both in psychiatric institutions and in the community.

In recent years, the interest in dual diagnosis patients has increased, mainly as a result of the increase in the prevalence of dual diagnoses, as well as the spread of cannabis and cocaine use in addition to alcohol use. Although specific resources are available for patients with dual pathology in Spain (such as inpatient and outpatient units, or day-care centres), efforts are being made to provide integrated treatment at outpatient level, both in community centres for drug use treatment and in community mental health centres. A national online survey of professionals regarding the availability of specific resources for the management of patients with dual pathology results revealed that, although professionals are aware of the need for specific treatment resources for these patients, available integrated healthcare resources are still scant. Professionals support the need for implementing integrated resources for the management of patients with dual diagnoses (Szerman et al., 2014).

Sweden

In the national guidelines for substance abuse and dependence care (updated preliminary version from 2014), the National Board of Health and Welfare states that the care and treatment of several combined conditions often involve several authorities and treatment providers. Care and treatment that is provided by several bodies requires coordination, which is regulated in several propositions and regulations (e.g. SOSFS 2008: 20 and Proposition 2012/13: 17). These regulations state, among other things, that everyone in need shall be offered a coordinated individual action plan and that people with substance abuse and dependence and concurrent psychiatric (or somatic) disease are a group in which coordinated actions are of great importance. The recommendations further state that integrated treatment that focuses on both the psychiatric disorder and the substance use disorder should be provided.

Coordination of actions can be organised in various ways, for example by a psychiatric team that includes the treatment of substance abuse and addiction within the team (e.g. assertive community treatment) or through coordination between different services (i.e. case management).

Turkey

The existing treatment centres provide services in accordance with the Regulation on Substance Addiction Treatment Centres issued by the Ministry of Health in 2013 following the repeal of the regulation issued in 2004. Inpatient and outpatient treatment services for detoxification and medical treatment are offered by the inpatient and outpatient treatment centres licensed in accordance with the regulation. As per Law 5510 on social insurance and universal health insurance, all citizens in the country are covered by the universal health insurance and outpatient addicts also receive

psychiatric treatment on the psychiatric wards of healthcare providers.

United Kingdom

Weaver et al. (2003) found that 44 % of community mental health patients had reported problem drug use or harmful alcohol use in the previous year. In drug and alcohol treatment services, 75 % and 85 % of patients, respectively, had had a psychiatric disorder in the past year — most had affective disorders (depression) and anxiety disorders.

A range of guidelines from the National Institute for Health and Care Excellence (NICE) on alcohol, other drugs and tobacco use and mental illness acknowledge the issue of comorbidity, and it is explicitly addressed by both 'Drug misuse and dependence: UK guidelines on clinical management' (Department of Health and the devolved administrations, 2007) and 'Dual diagnosis good practice guide' (Department of Health, 2002). It is recognised that individuals with these dual problems need high-quality, patient-focused and integrated psychiatric and addiction treatment in a setting most suitable for their needs. This may be delivered in either specialist addiction services or mental health services, or through a combination of both. Clarity on competencies and shared care models is important.

Table 6.1 summarises the networks in which treatment for comorbid patients is provided in European countries, taking into account whether the treatment is provided through outpatient or inpatient facilities. In the majority of countries, patients with comorbid mental and drug use disorders can be treated in both outpatient and inpatient facilities and by both specialised drug treatment and mental health treatment services. Specific dual diagnosis services exist in 13 of the countries in inpatient settings and in six countries in outpatient settings.

TABLE 6.1

Network in which treatment for comorbid patients is provided in European countries: outpatient and inpatient facilities

Country	Outpatient settings					Inpatient settings				
	General health	Drug use	Mental health	Drug use + mental health	Dual diagnosis facilities	General health	Drug use	Mental health	Drug use + mental health	Dual diagnosis facilities
Austria	X	X	X	X		X	X	X	X	
Belgium	X	X	Some centres				X	X		X
Bulgaria	X		X					X		
Croatia				X						X
Cyprus		X	X				X	X		
Czech Republic			X				X	X		
Denmark	X	X	X	X	X	X	X	X	X	X
Estonia		X	X					X		
Finland	X	X	X	X	X	X	X	X	X	X
France	X	X	X			X	X	X		
Germany		X	X			X	X	X		
Greece		X	X		X		X	X		
Hungary		X	X				X	X		
Ireland	X	X					X			
Italy		X	X				X	X		X
Latvia		X						X		
Lithuania		X	X				X	X		
Luxembourg		X					X			
Malta		X				X	X	X	X	X
Netherlands		X	X				X	X		X
Norway	X	X	X		X	X	X	X		X
Poland		X	X				X	X		X
Portugal		X	X				X	X		
Romania	X	X	X	X		X	X	X	X	
Slovakia		X	X				X	X		
Slovenia		X	X	X			X			X
Spain		X		X			X	X		X
Sweden	X	X	X	X	X	X	X	X	X	X
Turkey			X				X			
United Kingdom	X	X	X	X	X	X	X	X	X	X

General health refers to the care system for all diseases (e.g. general practitioners, community health centres, general hospitals). *Drug use* refers to facilities for the treatment of patients with alcohol or illicit drug-use disorders (e.g. drug use outpatient centres, detoxification units, therapeutic communities). *Mental health* refers to facilities for the treatment of mental disorders (e.g. mental health community centres, day-hospitals, psychiatric units in general or psychiatric hospitals). *Drug use + mental health* refers to the situation where in some regions there is only one network for the treatment of either mental disorders or substance use disorders, in co-occurrence or alone. *Dual diagnosis facilities* refers to specific units for treating psychiatric comorbidity among patients with substance use disorders.

CHAPTER 7

Conclusion and recommendations

Conclusion

The presence of comorbid mental disorders in those with substance use disorders has progressively become a matter of great concern. The relevance of psychiatric comorbidity in substance users is related to its high prevalence (about 50 %), its clinical and social severity, its difficult management, and its association with poor outcomes for the subjects affected. Individuals with both a substance use disorder and another psychiatric disorder show more clinical and psychosocial severity, as well as illicit behaviours, than subjects with substance use disorders without psychiatric comorbidity.

Available data on the prevalence of psychiatric comorbidity among drug users in European countries are very heterogeneous. Reported prevalence rates are dependent on factors such as the psychoactive substances considered (in this report we have focused on illicit drugs); the samples studied (general, clinical or special populations); the gender of patients; the study settings (primary healthcare, mental health or drug use treatment services; outpatient or inpatient facilities); the definition or diagnosis of psychiatric comorbidity used; and the drug epidemiology patterns in the different European countries.

The most frequent psychiatric comorbidities among users of illicit substances are major depression, anxiety disorders (mainly panic and post-traumatic stress disorders) and personality disorders (mainly antisocial and borderline). Among people with psychosis (i.e. schizophrenia and bipolar disorder), comorbid substance use disorders are also common. Among psychotic patients, in addition to cigarette smoking, the most frequent drugs of use and misuse are alcohol and cannabis and, more recently, cocaine. This combination is associated with an exacerbation of psychotic symptoms, treatment non-compliance and poorer outcomes. The relationship between schizophrenia and cannabis use in young people is an area of special interest owing to the relatively high prevalence of cannabis use among young people in the some European countries.

A number of non-exclusive aetiological and neurobiological hypotheses could explain the fact of this comorbidity. Sometimes it may represent vulnerability for two or more

independent conditions. In some cases, the psychiatric disorder should be considered as a risk factor for drug use and the development of a comorbid substance use disorder. In other cases, substance use can trigger the development of a psychiatric disorder in such a way that the additional disorder then runs an independent course. Finally, a temporary psychiatric disorder can be produced as a consequence of intoxication with, or withdrawal from, a specific type of substance, also called substance-induced disorder. In any case, clinical practice has shown that comorbid disorders are reciprocally interactive and cyclical, and poor prognoses of both psychiatric and substance use disorders are to be expected if no diagnosis of the psychiatric comorbidity is made and, in consequence, treatment for both substance use and the other psychiatric disorder (dual disorder) is not provided. Accordingly, the systematic detection of other mental disorders among substance users is an important issue.

To facilitate this difficult task, instruments to assess psychiatric comorbidity in individuals with substance use disorders are available. The choice of assessment instrument will depend on the context and setting (clinical, epidemiological or research), the time available to conduct the assessment and the expertise of staff. Standard screening instruments for substance use disorders and mental disorders should be used routinely in situations where time available to staff or the lack of staff expertise makes the application of more extended assessments very difficult. Without this screening routine, cases of psychiatric comorbidity may be missed when patients seek treatment in a service specialised in substance use disorders but with limited access to specialised mental health expertise, or when substance use disorders are treated by general practitioners. Although this can be very positive for accessibility, general practitioners may be not fully familiar with psychiatric diagnosis and diagnosis of psychiatric comorbidity. If psychiatric comorbidity is detected, a definitive diagnosis and adequate treatment must be organised.

Overall, psychiatric comorbidity has a greater impact on clinical severity, psychosocial functioning and quality of life of individuals with substance use disorders. Conversely, among people with mental disorders, those with coexisting substance use have a higher risk of relapse and admission to hospital and higher mortality.

Psychiatric comorbidity in substance use disorder patients increases the treatment difficulties and the risk of chronicity, leading to a poor prognosis of both psychiatric and substance use disorders with less chances of recovery. Despite the relevance of providing effective treatments for patients with comorbid substance use and mental disorders, there is still a lack of consensus regarding the most appropriate treatment settings and pharmacological and psychosocial strategies.

Comorbid patients often have difficulties in accessing, and being coordinated within, required mental health and substance abuse services. The main barriers to the treatment of comorbid substance use and mental disorders are the separation of mental health and drug use treatment networks in most European countries, the fact that treatment services may lack sufficient combined expertise to treat both types of disorders, treatment approaches and regulations or even financial resources.

Recommendations

Considering the burden on health and legal systems, and despite the existence of considerable differences across Europe and the continual changes in the drugs market and epidemiology, it is important to study psychiatric comorbidity in drug users, not only to determine its magnitude but also to improve the coverage of appropriate treatment. The detection and effective treatment of psychiatric comorbidity among those with substance use disorders constitutes one of the biggest challenges that policymakers, professionals and clinicians working in the drugs field must face in the upcoming years. To achieve this objective, a number of recommendations are made here.

The systematic detection and treatment of comorbid substance use and mental disorders through the use of validated instruments is highly recommended. The choice of the assessment instrument will depend on the context (clinical, epidemiological, research), the time

Main findings

- The comorbidity of mental disorders in those with a substance use disorder is an important issue. These comorbid patients show more clinical and psychosocial severity, as well as illicit behaviours, than patients with substance use disorders without comorbid mental disorders.
- Available data on the prevalence of comorbid mental disorders among those with drug use disorders in European countries are very heterogeneous.
- The prevalence rates of comorbid substance use and mental disorders depend on the psychoactive substances considered (in this report we have focused on illicit drugs); samples studied (general, clinical or special populations); gender of the study subjects; study settings (primary health, mental health or drug use treatment services; outpatient or inpatient facilities); definition/diagnosis of psychiatric comorbidity and the drug use patterns in different European countries.
- The most frequent psychiatric comorbidities among individuals with substance use disorders are major depression, anxiety (mainly panic and post-traumatic stress disorders) and personality disorders (mainly antisocial and borderline).
- The presence of comorbid mental disorders increases the difficulty of treating those with substance use disorders, as well as the risk of chronicity, leading to poor prognoses for both the psychiatric disorder and the substance use disorders, with poorer chances of recovery.
- Despite the relevance of providing effective treatments for patients with comorbid substance use and mental disorders, there is still a lack of consensus regarding the most appropriate setting and pharmacological and psychosocial strategies.
- Substance using patients with comorbid mental disorders often have difficulties in accessing, and being coordinated within, required services of mental health and substance abuse.
- The main barriers for the treatment of comorbid substance use and mental disorders are the separation of mental health and drug use treatment networks in most European countries; the fact that treatment services may lack sufficient combined expertise to treat both types of disorders; treatment approaches; regulations or even financial resources.

available to conduct the assessment and the expertise of staff. Standard screening instruments for substance use disorders and for mental health disorders should be used routinely in situations in which staff time or the lack of expertise exclude the universal application of more extended assessments.

Once diagnosed, the therapeutic approach to the treatment of comorbid patients, whether pharmacological, psychological or both, has to take into account both disorders from the first moment of detection, in order to choose the best option for each individual and improve outcomes. Future studies to improve the evidence base for care strategies and pharmacological and psychosocial treatments in these comorbid patients are recommended.

Finally, owing to gaps in the knowledge of this issue in Europe, some future actions in the EU context in relation to psychiatric comorbidity among those with substance use disorders are suggested:

- The introduction of specific items relating to prevalence and treatment of psychiatric comorbidity in the reporting systems on drug use treatment across Europe.
- A more in-depth review of service organisation in European countries is needed and recommended. Furthermore, a multinational study involving EU countries is also recommended because of the heterogeneous data that are available on the comorbidity of substance use and mental disorders in the European Union. If evaluated with the same methodology, this will enable the comparison of results and work further towards a more harmonised assessment of needs regarding management and treatment of these comorbid patients.
- A comprehensive review and research on possible early interventions to identify high-risk cases (i.e. early adolescents) is highly recommended to apply prevention measures.

Recommendations

- Considering the burden on health and legal systems, the systematic detection and treatment of comorbid mental disorders in subjects with substance use disorders is recommended.
- The use of validated instruments to assess the comorbidity of substance use and mental disorders is highly recommended.
- The choice of the assessment instrument will depend on the context (clinical, epidemiological, research), the time available to conduct the assessment and the expertise of staff. Standard screening instruments for substance use disorders and for mental disorders should be used routinely in situations in which staff time or lack of staff expertise exclude the universal application of more extended assessments.
- The therapeutic approach to tackle dual diagnosis, whether pharmacological, psychological or both, has to take into account both disorders simultaneously and from the first point of contact in order to choose the best option for each individual.
- A more in-depth review of service organisation in European countries is needed and recommended. Furthermore, a multinational study is also recommended because of heterogeneous data that are available on the comorbidity of substance use and mental disorders in the European Union. If evaluated with the same methodology, this will enable the comparison of results and to work further towards a more harmonised assessment of needs regarding management and treatment of these comorbid patients.
- The introduction of specific items about psychiatric comorbidity in substance use disorder patients (e.g. prevalence) needs to be published consistently within the existing reporting systems across Europe.
- Future studies to improve the evidence base for care strategies and pharmacological and psychosocial treatments in these comorbid patients are recommended.
- A comprehensive review and research on possible early interventions to identify high-risk cases (e.g. early adolescents) is highly recommended to apply prevention measures.

Glossary

EMCDDA definitions of terms

Detoxification: a medically supervised intervention to resolve withdrawal symptoms. Usually it is combined with some psychosocial interventions for continued care. Detoxification could be provided as an inpatient as well as in a community-based outpatient programme.

Drug treatment: treatment comprising all structured interventions' specific pharmacological and/or psychosocial techniques aimed at reducing or abstaining from the use of illegal drugs. In the EMCDDA Treatment Demand Indicator Protocol (version 3.0) (EMCDDA, 2012), the following definition is provided: an activity (activities) that directly targets people who have problems with their drug use and aims at achieving defined aims with regard to the alleviation and/or elimination of these problems, provided by experienced or accredited professionals, in the framework of recognised medical, psychological or social assistance practice. This activity often takes place at specialised facilities for drug users, but may also take place in general services offering medical/psychological help to people with drug problems.

Inpatient treatment: treatment in which the patient spends the night in the treatment centre.

Outpatient treatment: treatment in which the patient does not spend the night at the premises.

Problem drug use: defined as 'injecting drug use or long duration/regular use of opioids, cocaine and/or amphetamines'.

Psychosocial treatment: treatment including structured counselling, motivational enhancement, case

management, care-coordination, psychotherapy and relapse prevention.

Substitution treatment: treatment of drug dependence by prescription of a substitute drug (agonists and antagonists) for which cross-dependence and cross-tolerance exists, with the goal to reduce or eliminate the use of a particular substance, especially if it is illegal, or to reduce harm from a particular method of administration, the attendant dangers for health (e.g. from needle sharing), and the social consequences.

Treatment centre: any agency that provides treatment to people with drug problems. Treatment centres can be based within structures that are medical or non-medical, governmental or non-governmental, public or private, specialised or non-specialised. They include inpatient detoxification units, outpatient clinics, drug substitution programmes (maintenance or shorter-term), therapeutic communities, counselling and advice centres, street agencies, crisis centres, drug-treatment programmes in prisons and special services for drug users within general health or social-care facilities (Treatment demand indicator protocol version 2.0, EMCDDA and Pompidou Group, 2000).

For further information, see <http://www.emcdda.europa.eu/publications/glossary>

Other resources

World Health Organization terminology (WHO, 1994)

For further information, see http://www.who.int/substance_abuse/terminology/en/

Appendix

Diagnostic criteria

Substance use disorders occur in a broad range of severity, from mild to severe, with severity based on the number of symptom criteria endorsed. As a general estimate of severity, a mild substance use disorder is suggested by the presence of two to three symptoms, moderate by four to five symptoms, and severe by six or more symptoms. Changing severity across time is also reflected by reductions or increases in the frequency or dose of substance use, as assessed by the individual's own report, reports by knowledgeable others, clinicians' observations, and biological testing. The following course specifiers and descriptive features specifiers are also available for substance use disorders: 'in early remission', 'in sustained remission', 'on maintenance therapy', and 'in a controlled environment'. Definitions of each are provided within respective criteria sets.

Problematic drug use was defined by the EMCDDA as 'injecting drug use or long duration or regular use of opioids, cocaine and/or amphetamines excluding ecstasy and cannabis users'. As a reaction to a growing stimulants problem as well as to growing number of cannabis-related treatment demands, the EMCDDA examined the possibilities of breakdowns by main drug, as well as the best way of estimating the population of problematic cannabis users. From February 2013, the term 'problematic drug use' was renamed and redefined as 'high-risk drug use', meaning 'recurrent drug use that is causing actual harms (negative consequences) to the person (including dependence, but also other health, psychological or social problems) or is placing the person at a high probability/risk of suffering such harms' (see <http://www.emcdda.europa.eu/activities/hrdu>).

International Classification of Diseases Tenth Edition diagnostic criteria

Harmful substance use: a pattern of psychoactive substance use that is causing damage to health. The damage may be physical or mental, and is in the absence of diagnosis of dependence syndrome

Dependence syndrome: a cluster of behavioural, cognitive and physiological phenomena that develop after repeated substance use and that typically include a strong desire to take the drug, difficulties in controlling its use, persisting in its use despite harmful consequences, a higher priority given to drug use than to other activities and obligations, increased tolerance, and sometimes a physical withdrawal state.

Criteria (three or more in the past year):

1. a strong desire or sense of compulsion to take the substance;
2. impaired capacity to control substance-taking behaviour in terms of its onset, termination, or levels of use, as evidenced by the substance being often taken in larger amounts or over a longer period than intended, or by a persistent desire or unsuccessful efforts to reduce or control substance use;
3. a physiological withdrawal state when substance use is reduced or ceased, as evidenced by the characteristic withdrawal syndrome for the substance, or by use of the same (or closely related) substance with the intention of relieving or avoiding withdrawal symptoms;
4. evidence of tolerance to the effects of the substance, such that there is a need for significantly increased amounts of the substance to achieve intoxication or the desired effect, or a markedly diminished effect with continued use of the same amount of the substance;
5. preoccupation with substance use, as manifested by important alternative pleasures or interests being given up or reduced because of substance use; or a great deal of time being spent in activities necessary to obtain, take or recover from the effects of the substance;
6. persistent substance use despite clear evidence of harmful consequences.

Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition and Text Revision diagnostic criteria

Substance abuse: one or more criteria for over one year; never meet criteria for dependence:

1. failure to fulfil major role obligations at work, school or home, for example repeated absences or poor work performance related to substance use; substance-related absences, suspensions, or expulsions from school; neglect of children or household;
2. frequent use of substances in situation in which it is physically hazardous (e.g. driving an automobile or operating a machine when impaired by substance use);
3. frequent legal problems (e.g. arrests, disorderly conduct) for substance abuse;
4. continued use despite having persistent or recurrent social or interpersonal problems (e.g. arguments with a spouse about consequences of intoxication, physical fights).

Substance dependence: three or more criteria over one year:

1. tolerance of or markedly increased amounts of the substance to achieve intoxication or desired effect or markedly diminished effect with continued use of the same amount of substance;
2. withdrawal symptoms or the use of certain substances to avoid withdrawal symptoms;
3. use of a substance in larger amounts or over a longer period than was intended;
4. persistent desire or unsuccessful efforts to cut down or control substance use;
5. involvement in chronic behaviour to obtain the substance, use the substance, or recover from its effects;
6. reduction or abandonment of social, occupational or recreational activities because of substance use;
7. use of substances even though there is a persistent or recurrent physical or psychological problem that is likely to have been caused or exacerbated by the substance.

Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition diagnostic criteria

Substance use disorder: the DSM-5 conceptualisation of substance use disorder classification involves a shift from the traditional categorical approach to a dimensional approach. The changes to the DSM-5 include collapsing the four abuse and seven dependence criteria of DSM-IV into a single unified substance use disorder category of graded clinical severity, with two criteria required to make a diagnosis. Specifically, the new substance use disorder category will include two severity levels based on the total number of positive criteria: moderate (two or three positive criteria); and severe (four or more positive criteria). The changes also include the removal of the legal problems criterion (DSM-IV abuse criterion 3) and the addition of a criterion representing craving or compulsive use:

1. The individual may take the substance in larger amounts or over a longer period than was originally intended.
2. The individual may express a persistent desire to cut down or regulate substance use and may report multiple unsuccessful efforts to decrease or discontinue use.
3. The individual may spend a great deal of time obtaining the substance, using the substance, or recovering from its effects.
4. Craving is manifested by an intense desire or urge for the drug that may occur at any time but is more likely when in an environment where the drug previously was obtained or used.
5. Recurrent substance use may result in a failure to fulfil major role obligations at work, school or home.
6. The individual may continue substance use despite having persistent or recurrent social or interpersonal problems caused or exacerbated by the effects of the substance.
7. Important social, occupational or recreational activities may be given up or reduced because of substance use.
8. This may take the form of recurrent substance use in situations in which it is physically hazardous.
9. The individual may continue substance use despite knowledge of having a persistent or recurrent

physical or psychological problem that is likely to have been caused or exacerbated by the substance.

10. Tolerance is signalled by requiring a markedly increased dose of the substance to achieve the desired effect or a markedly reduced effect when the usual dose is consumed.
11. Withdrawal is a syndrome that occurs when blood or tissue concentrations of a substance decline in an individual who had maintained prolonged heavy use of the substance.

References

- Abram, K. M. and Teplin, L. A. (1991), 'Co-occurring disorders among mentally ill jail detainees. Implications for public policy', *The American Psychologist* 46(10), pp. 1036–45.
- Adamson, S. J. and Sellman, J. D. (2003), 'A prototype screening instrument for cannabis use disorder: The Cannabis Use Disorders Identification Test (CUDIT) in an alcohol-dependent clinical sample', *Drug and Alcohol Review* 22(3), pp. 309–15.
- Aharonovich, E., Garawi, F., Bisaga, A., Brooks, D., Raby, W. N., Rubin, E., Nunes, E. V. and Levin, F. R. (2006), 'Concurrent cannabis use during treatment for comorbid ADHD and cocaine dependence: effects on outcome', *The American Journal of Drug and Alcohol Abuse* 32(4), pp. 629–35.
- Aichhorn, W., Santeler, S., Stelzig-Scholer, R., Kemmler, G., Steinmayr-Gensluckner, M. and Hinterhuber, H. (2008), '[Prevalence of psychiatric disorders among homeless adolescents]', *Neuropsychiatrie: Klinik, Diagnostik, Therapie Und Rehabilitation* 22(3), pp. 180–88.
- Alexander, M. J., Haugland, G., Lin, S. P., Bertollo, D. N. and McCorry, F. A. (2008), 'Mental health screening in addiction, corrections and social service settings: Validating the MMS', *International Journal of Mental Health and Addiction* 6(1), pp. 105–19.
- APA (1980), *Diagnostic and statistical manual of mental disorders, third edition*, American Psychiatric Association, Washington, D.C.
- APA (1987), *Diagnostic and statistical manual of mental disorders, revised third edition*, American Psychiatric Association, Washington, D.C.
- APA (1994), *Diagnostic and statistical manual of mental disorders, fourth edition*, American Psychiatric Association, Washington, D.C.
- APA (2000), *Diagnostic and statistical manual of mental disorders, fourth edition, text revision*, American Psychiatric Association, Washington, D.C.
- APA (2013), *Diagnostic and statistical manual of mental disorders, fifth edition*, American Psychiatric Association, Washington, D.C.
- Araos, P., Vergara-Moragues, E., Pedraz, M., Pavón, F. J., Campos Cloute, R., et al. (2014), '[Psychopathological comorbidity in cocaine users in outpatient treatment]', *Adicciones* 26(1), pp. 15–26.
- Arendt, M., Sher, L., Fjorndback, L., Brandholdt, J. and Munk-Jorgensen, P. (2007), 'Parental alcoholism predicts suicidal behavior in adolescents and young adults with cannabis dependence', *International Journal of Adolescent Medicine and Health* 19(1), pp. 67–77.
- Arendt, M., Munk-Jørgensen, P., Sher, L. and Jensen, S. O. W. (2011), 'Mortality among individuals with cannabis, cocaine, amphetamine, MDMA, and opioid use disorders: A nationwide follow-up study of Danish substance users in treatment', *Drug and Alcohol Dependence* 114(2-3), pp. 134–39.
- Astals, M., Domingo-Salvany, A., Buenaventura, C. C., Tato, J., Vazquez, J. M., Martín-Santos, R. and Torrens, M. (2008), 'Impact of substance dependence and dual diagnosis on the quality of life of heroin users seeking treatment', *Substance Use & Misuse* 43(5), pp. 612–32.
- Astals, M., Díaz, L., Domingo-Salvany, A., Martín-Santos, R., Bulbena, A. and Torrens, M. (2009), 'Impact of co-occurring psychiatric disorders on retention in a methadone maintenance program: an 18-month follow-up study', *International Journal of Environmental Research and Public Health* 6(11), pp. 2822–32.
- Australian Institute of Health and Welfare (2005), *National comorbidity initiative: A review of data collections relating to people with coexisting substance use and mental health disorders*, AIHW Cat. No. PHE 60. (Drug Statistics Series No 14). Canberra: AIHW.
- Baldacchino, A. (2007), 'Co-morbid substance misuse and mental health problems: policy and practice in Scotland', *The American Journal on Addictions* 16(3), pp. 147–59.
- Baldacchino, A. and Corkery, J. (editors) (2006), *Comorbidity: perspectives across Europe*, European Collaborating Centres in Addiction Studies, London.

- Baldacchino, A., Blair, H., Scherbaum, N., Grosse-Vehne, E., Riglietta, M., et al. (2009), 'Drugs and psychosis project: a multi-centre European study on comorbidity', *Drug and Alcohol Review* 28(4), pp. 379–89.
- Ball, S. A., Rounsaville, B. J., Tennen, H. and Kranzler, H. R. (2001), 'Reliability of personality disorder symptoms and personality traits in substance-dependent inpatients', *Journal of Abnormal Psychology* 110(2), pp. 341–52.
- Barkley, R. A., Fischer, M., Smallish, L. and Fletcher, K. (2003), 'Does the treatment of attention-deficit/hyperactivity disorder with stimulants contribute to drug use/abuse? A 13-year prospective study', *Pediatrics* 111(1), pp. 97–109.
- Barkus, E. and Murray, R. M. (2010), 'Substance use in adolescence and psychosis: clarifying the relationship', *Annual Review of Clinical Psychology* 6, pp. 365–89.
- Barnett, J. H., Werners, U., Secher, S. M., Hill, K. E., Brazil, R., et al. (2007), 'Substance use in a population-based clinic sample of people with first-episode psychosis', *British Journal of Psychiatry* 190, pp. 515–20.
- Batalla, A., Garcia-Rizo, C., Castellví, P., Fernandez-Egea, E., Yücel, M., et al. (2013), 'Screening for substance use disorders in first-episode psychosis: Implications for readmission', *Schizophrenia Research* 146(1-3), pp. 125–31.
- Beijer, U., Andréasson, A., Agren, G. and Fugelstad, A. (2007), 'Mortality, mental disorders and addiction: a 5-year follow-up of 82 homeless men in Stockholm', *Nordic Journal of Psychiatry* 61(5), pp. 363–68.
- Benjamin, A. B., Mossman, D., Graves, N. S. and Sanders, R. D. (2006), 'Tests of a symptom checklist to screen for comorbid psychiatric disorders in alcoholism', *Comprehensive Psychiatry* 47(3), pp. 227–33.
- Berkson, J. (1946), 'Limitations of the application of fourfold table analysis to hospital data', *Biometrics* 2(3), pp. 47–53.
- Berman, A. H., Bergman, H., Palmstierna, T. and Schlyter, F. (2005), 'Evaluation of the Drug Use Disorders Identification Test (DUDIT) in criminal justice and detoxification settings and in a Swedish population sample', *European Addiction Research* 11(1), pp. 22–31.
- Bernacer, J., Corlett, P. R., Ramachandra, P., McFarlane, B., Turner, D. C., et al. (2013), 'Methamphetamine-induced disruption of frontostriatal reward learning signals: relation to psychotic symptoms', *American Journal of Psychiatry* 170(11), pp. 1326–34.
- Bizzarri, J. V., Rucci, P., Sbrana, A., Miniati, M., Raimondi, F., et al. (2009), 'Substance use in severe mental illness: self-medication and vulnerability factors', *Psychiatry Research* 165(1-2), pp. 88–95.
- Błachut, M., Badura-Brzoza, K., Jarzab, M., Gorczyca, P. and Hese, R. T. (2013), '[Dual diagnosis in psychoactive substance abusing or dependent persons]', *Psychiatria Polska* 47(2), pp. 335–52.
- Blanco, C., Alegría, A. A., Liu, S.-M., Secades-Villa, R., Sugaya, L., Davies, C. and Nunes, E. V. (2012), 'Differences among major depressive disorder with and without co-occurring substance use disorders and substance-induced depressive disorder: results from the National Epidemiologic Survey on Alcohol and Related Conditions', *The Journal of Clinical Psychiatry* 73(6), pp. 865–73.
- Blinder, B. J., Cumella, E. J. and Sanathara, V. A. (2006), 'Psychiatric comorbidities of female inpatients with eating disorders', *Psychosomatic Medicine* 68(3), pp. 454–62.
- Boden, M. T. and Moos, R. (2009), 'Dually diagnosed patients' responses to substance use disorder treatment', *Journal of Substance Abuse Treatment* 37(4), pp. 335–45.
- Booth, B. M., Walton, M. A., Barry, K. L., Cunningham, R. M., Chermack, S. T. and Blow, F. C. (2011), 'Substance use depression and mental health functioning in patients seeking acute medical care in an inner-city ED', *Journal of Behavioral Health Services and Research* 38(3), pp. 358–72.
- Brady, K. T. and Sinha, R. (2005), 'Co-occurring mental and substance use disorders: the neurobiological effects of chronic stress', *American Journal of Psychiatry* 162(8), pp. 1483–93.
- Brady, K. T. and Verduin, M. L. (2005), 'Pharmacotherapy of comorbid mood, anxiety, and substance use disorders', *Substance Use & Misuse* 40(13-14), pp. 2021–41, 2043–48.

- Brand, E. F. J. M., Lucker, T. P. C. and van den Hurk, A. A. (2009), '[Addiction and recidivism in forensic psychiatry]', *Tijdschrift Voor Psychiatrie* 51(11), pp. 813–20.
- Broadhead, W. E., Leon, A. C., Weissman, M. M., Barrett, J. E., Blacklow, R. S., et al. (1995), 'Development and validation of the SDDS-PC screen for multiple mental disorders in primary care', *Archives of Family Medicine* 4(3), pp. 211–19.
- Burnam, M. A. and Watkins, K. E. (2006), 'Substance abuse with mental disorders: specialized public systems and integrated care', *Health Affairs* 25(3), pp. 648–58.
- Carey, M. P., Carey, K. B., Maisto, S. A., Gordon, C. M. and Venable, P. A. (2001), 'Prevalence and correlates of sexual activity and HIV-related risk behavior among psychiatric outpatients', *Journal of Consulting and Clinical Psychology* 69(5), pp. 846–50.
- Carrà, G. and Johnson, S. (2009), 'Variations in rates of comorbid substance use in psychosis between mental health settings and geographical areas in the UK. A systematic review', *Social Psychiatry and Psychiatric Epidemiology* 44(6), pp. 429–47.
- Carrà, G., Johnson, S., Bebbington, P., Angermeyer, M. C., Heider, D., Brugha, T., Azorin, J. M. and Toumi, M. (2012), 'The lifetime and past-year prevalence of dual diagnosis in people with schizophrenia across Europe: findings from the European Schizophrenia Cohort (EuroSC)', *European Archives of Psychiatry and Clinical Neuroscience* 262(7), pp. 607–16.
- Carroll, J. F. X. and McGinley, J. J. (2001), 'A screening form for identifying mental health problems in alcohol/other drug dependent persons', *Alcoholism Treatment Quarterly* 19(4), pp. 33–47.
- Casadio, P., Olivoni, D., Ferrari, B., Pintori, C., Speranza, E., et al. (2014), 'Personality disorders in addiction outpatients: prevalence and effects on psychosocial functioning', *Substance Abuse: Research and Treatment* 8, pp. 17–24.
- Casares-López, M. J., González-Menéndez, A., Bobes-Bascarán, M. T., Secades, R., Martínez-Cordero, A. and Bobes, J. (2011), '[Need for the assessment of dual diagnosis in prisons]', *Adicciones* 23(1), pp. 37–44.
- Caton, C. L. M., Shrout, P. E., Eagle, P. F., Opler, L. A., Felix, A. and Dominguez, B. (1994), 'Risk factors for homelessness among schizophrenic men: a case-control study', *American Journal of Public Health* 84(2), pp. 265–70.
- Charzynska, K., Hyldager, E., Baldacchino, A., Greacen, T., Henderson, Z., et al. (2011), 'Comorbidity patterns in dual diagnosis across seven European sites', *The European Journal of Psychiatry* 25(4), pp. 179–91.
- Clark, C. and Young, M. S. (2009), 'Outcomes of mandated treatment for women with histories of abuse and co-occurring disorders', *Journal of Substance Abuse Treatment* 37(4), pp. 346–52.
- Colins, O., Vermeiren, R., Vahl, P., Markus, M., Broekaert, E. and Doreleijers, T. (2011), 'Psychiatric disorder in detained male adolescents as risk factor for serious recidivism', *Canadian Journal of Psychiatry* 56(1), pp. 44–50.
- Combaluzier, S., Gouvernet, B. and Bernoussi, A. (2009), '[Impact of personality disorders in a sample of 212 homeless drug users]', *L'Encéphale* 35(5), pp. 448–53.
- Conner, K. R. (2011), 'Clarifying the relationship between alcohol and depression', *Addiction* 106(5), pp. 915–16.
- Corte, C. and Stein, K. F. (2000), 'Eating disorders and substance use. An examination of behavioral associations', *Eating Behaviors* 1(2), pp. 173–89.
- Coscas, S., Benyamina, A., Reynaud, M. and Karila, L. (2013), '[Psychiatric complications of cannabis use]', *La Revue Du Praticien* 63(10), pp. 1426–28.
- Craig, T. K. J., Johnson, S., McCrone, P., Afuwape, S., Hughes, E., et al. (2008), 'Integrated care for co-occurring disorders: psychiatric symptoms, social functioning, and service costs at 18 months', *Psychiatric Services* 59(3), pp. 276–82.
- Cuenca-Royo, A. M., Sánchez-Niubó, A., Forero, C. G., Torrens, M., Suelves, J. M. and Domingo-Salvany, A. (2012), 'Psychometric properties of the CAST and SDS scales in young adult cannabis users', *Addictive Behaviors* 37(6), pp. 709–15.

- Cuenca-Royo, A. M., Torrens, M., Sánchez-Niubó, A., Suelves, J. M. and Domingo-Salvany, A. (2013), 'Psychiatric morbidity among young-adults cannabis users', *Adicciones* 25(1), pp. 45–53.
- Cuffel, B. J., Shumway, M., Chouljian, T. L. and MacDonald, T. (1994), 'A longitudinal study of substance use and community violence in schizophrenia', *The Journal of Nervous and Mental Disease* 182(12), pp. 704–8.
- Curran, G. M., Sullivan, G., Williams, K., Han, X., Allee, E. and Kotrla, K. J. (2008), 'The association of psychiatric comorbidity and use of the emergency department among persons with substance use disorders: an observational cohort study', *BMC Emergency Medicine* 8, p. 17.
- Curran, H. V. and Robjant, K. (2006), 'Eating attitudes, weight concerns and beliefs about drug effects in women who use ecstasy', *Journal of Psychopharmacology* 20(3), pp. 425–31.
- De Beurs, E., Beekman, A., Geerlings, S., Deeg, D., Van Dyck, R. and Van Tilburg, W. (2001), 'On becoming depressed or anxious in late life: similar vulnerability factors but different effects of stressful life events', *British Journal of Psychiatry* 179, pp. 426–31.
- De Wilde, J., Broekaert, E., Rosseel, Y., Delespaul, P. and Soye, V. (2007), 'The role of gender differences and other client characteristics in the prevalence of DSM-IV affective disorders among a European therapeutic community population', *The Psychiatric Quarterly* 78(1), pp. 39–51.
- Delgado, J., Payne, S., Gilbody, S., Godfrey, C., Gore, S., Jessop, D. and Dale, V. (2011), 'How reliable is depression screening in alcohol and drug users? A validation of brief and ultra-brief questionnaires', *Journal of Affective Disorders* 134(1-3), pp. 266–71.
- Dell'osso, L. and Pini, S. (2012), 'What did we learn from research on comorbidity in psychiatry? Advantages and limitations in the forthcoming DSM-V era', *Clinical Practice and Epidemiology in Mental Health* 8, pp. 180–84.
- DeLorenze, G. N., Tsai, A.-L., Horberg, M. A. and Quesenberry, C. P. (2014), 'Cost of care for HIV-infected patients with co-occurring substance use disorder or psychiatric disease: report from a large, integrated health plan', *AIDS Research and Treatment* doi:10.1155/2014/570546.
- Demyttenaere, K., Bruffaerts, R., Posada-Villa, J., Gasquet, I., Kovess, V., et al. (2004), 'Prevalence, severity, and unmet need for treatment of mental disorders in the World Health Organization World Mental Health Surveys', *JAMA* 291(21), pp. 2581–90.
- Department of Health (2002), *Mental health policy implementation guide: Dual diagnosis good practice guide*, Department of Health, London.
- Department of Health and the devolved administrations (2007), *Drug misuse and dependence: UK guidelines on clinical management*, Department of Health and the devolved administrations, London (available at http://www.nta.nhs.uk/uploads/clinical_guidelines_2007.pdf).
- Derogatis, L. R. and Melisaratos, N. (1983), 'The Brief Symptom Inventory: an introductory report', *Psychological Medicine* 13(3), pp. 595–605.
- Derogatis, L. R., Lipman, R. S. and Covi, L. (1973), 'SCL-90: an outpatient psychiatric rating scale. Preliminary report', *Psychopharmacology Bulletin* 9(1), pp. 13–28.
- Di Furia, L., Pizza, M., Rampazzo, L. and Corti, A. (2006), 'The Italian experience: (B) Comorbidity in Padua', in *Co-morbidity: Perspectives across Europe* edited by J. Corkery and A. Baldacchino, European Collaborating Centres on Addiction Studies (ECCAS), London, pp. 186–97.
- Drake, R. E., Mercer-McFadden, C., Mueser, K. T., McHugo, G. J., Bond, G. R. (1998), 'Review of integrated mental health and substance abuse treatment for patients with dual disorders', *Schizophrenia Bulletin* 24(4), pp. 589–608.
- Drake, R. E., Goldman, H. H., Leff, H. S., Lehman, A. F., Dixon, L., Mueser, K. T. and Torrey, W. C. (2001), 'Implementing evidence-based practices in routine mental health service settings', *Psychiatric Services* 52(2), pp. 179–82.
- Drake, R. E., Wallach, M. A. and McGovern, M. P. (2005), 'Future directions in preventing relapse to substance abuse among clients with severe mental illnesses', *Psychiatric Services* 56(10), pp. 1297–1302.
- Durvasula, R. and Miller, T. R. (2014), 'Substance abuse treatment in persons with HIV/AIDS: challenges in managing triple diagnosis', *Behavioral Medicine* 40(2), pp. 43–52.

- Einarsson, E., Sigurdsson, J. F., Gudjonsson, G. H., Newton, A. K. and Bragason, O. O. (2009), 'Screening for attention-deficit hyperactivity disorder and co-morbid mental disorders among prison inmates', *Nordic Journal of Psychiatry* 63(5), pp. 361–67.
- Elonheimo, H., Niemelä, S., Parkkola, K., Multimäki, P., Helenius, H., Nuutila, A. M. and Sourander, A. (2007), 'Police-registered offenses and psychiatric disorders among young males: the Finnish "from a boy to a man" birth cohort study', *Social Psychiatry and Psychiatric Epidemiology* 42(6), pp. 477–84.
- EMCDDA and Pompidou Group (2000), *Treatment demand indicator, standard protocol 2.0*, European Monitoring Centre for Drugs and Drug Addiction, Lisbon (available at <http://www.emcdda.europa.eu/html.cfm/index65315EN.html>).
- EMCDDA (2004), 'Co-morbidity', in *Annual Report 2004: The state of the drugs problem in the European Union and Norway*, Office for Official Publications of the European Communities, Luxembourg, pp. 94–102 (available at <http://www.emcdda.europa.eu/html.cfm/index34901EN.html>).
- EMCDDA (2012), *Treatment demand indicator (TDI) standard protocol 3.0: Guidelines for reporting data on people entering drug treatment in European countries*, Publications Office of the European Union, Luxembourg (available at <http://www.emcdda.europa.eu/publications/manuals/tdi-protocol-3.0>).
- EMCDDA (2013a), *Co-morbid substance use and mental disorders in Europe: a review of the data*, EMCDDA Papers, Publications Office of the European Union, Luxembourg (available at <http://www.emcdda.europa.eu/publications/emcdda-papers/co-morbidity>).
- EMCDDA (2013b), *Models of addiction*, Publications Office of the European Union, Luxembourg (available at <http://www.emcdda.europa.eu/publications/insights/models-addiction>).
- EMCDDA (2015), *The misuse of benzodiazepines among high-risk opioid users in Europe* (<http://www.emcdda.europa.eu/topics/pods/benzodiazepines>), retrieved 7 August 2015.
- Enatescu, V. R. and Dehelean, L. (2006), 'Psychiatric comorbidity in patients with substance misuse in Romania', in *Co-morbidity: Perspectives across Europe* edited by J. Corkery and A. Baldacchino, European Collaborating Centres on Addiction Studies (ECCAS), London, pp. 221–34.
- Endicott, J. and Spitzer, R. L. (1978), 'A diagnostic interview: the schedule for affective disorders and schizophrenia', *Archives of General Psychiatry* 35(7), pp. 837–44.
- Evans, E. A. and Sullivan, M. A. (2014), 'Abuse and misuse of antidepressants', *Substance Abuse and Rehabilitation* 5, pp. 107–20.
- Farrell, M. (2001), 'Nicotine, alcohol and drug dependence and psychiatric comorbidity. Results of a national household survey', *The British Journal of Psychiatry* 179(5), pp. 432–37.
- Fatséas, M., Denis, C., Lavie, E. and Auriacombe, M. (2010), 'Relationship between anxiety disorders and opiate dependence. A systematic review of the literature. Implications for diagnosis and treatment', *Journal of Substance Abuse Treatment* 38(3), pp. 220–30.
- Feighner, J. P., Robins, E., Guze, S. B., Woodruff, R. A., Winokur, G. and Munoz, R. (1972), 'Diagnostic criteria for use in psychiatric research', *Archives of General Psychiatry* 26(1), pp. 57–63.
- Feinstein, A. R. (1970), 'The pre-therapeutic classification of co-morbidity in chronic disease', *Journal of Chronic Diseases* 23(7), pp. 455–68.
- Fiorentini, A., Volonteri, L. S., Dragogna, F., Rovera, C., Maffini, M., Mauri, M. C. and Altamura, C. A. (2011), 'Substance-induced psychoses: a critical review of the literature', *Current Drug Abuse Reviews* 4(4), pp. 228–40.
- First, M. B. (1997), *User's guide for the structured clinical interview for DSM-IV axis I personality disorders: SCID-II*, American Psychiatric Press, Washington, D.C.
- Fischer, S. and Le Grange, D. (2007), 'Comorbidity and high-risk behaviors in treatment-seeking adolescents with bulimia nervosa', *International Journal of Eating Disorders* 40(8), pp. 751–53.
- Flynn, P. M. and Brown, B. S. (2008), 'Co-occurring disorders in substance abuse treatment: issues and prospects', *Journal of Substance Abuse Treatment* 34(1), pp. 36–47.

- Franko, D. L., Dorer, D. J., Keel, P. K., Jackson, S., Manzo, M. P. and Herzog, D. B. (2005), 'How do eating disorders and alcohol use disorder influence each other?', *The International Journal of Eating Disorders* 38(3), pp. 200–207.
- Funk, S. (2013), '[Pharmacological treatment in alcohol-, drug- and benzodiazepine-dependent patients: the significance of trazodone]', *Neuropsychopharmacologia Hungarica* 15(2), pp. 85–93.
- Goldberg, D. (1978), *Manual of the general health questionnaire*, National Foundation for Educational Research, Windsor.
- Goldberg, D. (1986), 'Use of the general health questionnaire in clinical work', *British Medical Journal (Clinical Research Ed)* 293(6556), pp. 1188–89.
- Grant, B. F., Harford, T. C., Dawson, D. A., Chou, P. S. and Pickering, R. P. (1995), 'The Alcohol Use Disorder and Associated Disabilities Interview Schedule (AUDADIS): reliability of alcohol and drug modules in a general population sample', *Drug and Alcohol Dependence* 39(1), pp. 37–44.
- Grant, B. F., Dawson, D. A. and Hasin, D. S. (2001), *The Alcohol Use Disorder and Associated Disabilities Interview Schedule DSM-IV version*, National Institute on Alcohol Abuse and Alcoholism, Bethesda, MD
- Grant, B. F., Dawson, D. A., Stinson, F. S., Chou, P. S., Kay, W. and Pickering, R. (2003), 'The Alcohol Use Disorder and Associated Disabilities Interview Schedule-IV (AUDADIS-IV): reliability of alcohol consumption, tobacco use, family history of depression and psychiatric diagnostic modules in a general population sample', *Drug and Alcohol Dependence* 71(1), pp. 7–16.
- Green, A. I. (2005), 'Schizophrenia and comorbid substance use disorder: effects of antipsychotics', *The Journal of Clinical Psychiatry* 66 Suppl 6, pp. 21–26.
- Green, A. I. (2006), 'Treatment of schizophrenia and comorbid substance abuse: pharmacologic approaches', *The Journal of Clinical Psychiatry* 67 Suppl 7, pp. 31–35; quiz 36–37.
- Green, A. I. and Brown, E. S. (2006), 'Comorbid schizophrenia and substance abuse', *The Journal of Clinical Psychiatry* 67(9), p. e08.
- Green, A. I., Noordsy, D. L., Brunette, M. F. and O'Keefe, C. (2008), 'Substance abuse and schizophrenia: pharmacotherapeutic intervention', *Journal of Substance Abuse Treatment* 34(1), pp. 61–71.
- Greenberg, G. A. and Rosenheck, R. A. (2014), 'Psychiatric correlates of past incarceration in the national co-morbidity study replication', *Criminal Behaviour and Mental Health* 24(1), pp. 18–35.
- Gregg, L., Barrowclough, C. and Haddock, G. (2007), 'Reasons for increased substance use in psychosis', *Clinical Psychology Review* 27(4), pp. 494–510.
- Gregorowski, C., Seedat, S. and Jordaan, G. P. (2013), 'A clinical approach to the assessment and management of co-morbid eating disorders and substance use disorders', *BMC Psychiatry* 13, p. 289.
- Gual, A. (2007), 'Dual diagnosis in Spain', *Drug and Alcohol Review* 26(1), pp. 65–71.
- Halmøy, A., Fasmer, O. B., Gillberg, C. and Haavik, J. (2009), 'Occupational outcome in adult ADHD: impact of symptom profile, comorbid psychiatric problems, and treatment: a cross-sectional study of 414 clinically diagnosed adult ADHD patients', *Journal of Attention Disorders* 13(2), pp. 175–87.
- Harrison, I., Joyce, E. M., Mutsatsa, S. H., Hutton, S. B., Huddy, V., Kapasi, M. and Barnes, T. R. E. (2008), 'Naturalistic follow-up of co-morbid substance use in schizophrenia: the West London first-episode study', *Psychological Medicine* 38(1), pp. 79–88.
- Harsch, S., Bergk, J. E., Steinert, T., Keller, F. and Jockusch, U. (2006), 'Prevalence of mental disorders among sexual offenders in forensic psychiatry and prison', *International Journal of Law and Psychiatry* 29(5), pp. 443–49.
- Hasin, D. S., Trautman, K. D., Miele, G. M., Samet, S., Smith, M. and Endicott, J. (1996), 'Psychiatric Research Interview for Substance and Mental Disorders (PRISM): reliability for substance abusers', *The American Journal of Psychiatry* 153(9), pp. 1195–1201.
- Hasin, D., Carpenter, K. M., McCloud, S., Smith, M. and Grant, B. F. (1997), 'The alcohol use disorder and associated disabilities interview schedule (AUDADIS): reliability of alcohol and drug modules in a clinical sample', *Drug and Alcohol Dependence* 44(2-3), pp. 133–41.

- Hasin, D. S., Samet, S., Meydan, J., Miele, G. and Endicott, J. (2001), *Psychiatric Research Interview for Substance and Mental Disorders (PRISM-IV)*, version 6.0.
- Hasin, D. S. and Grant, B. F. (2004), 'The co-occurrence of DSM-IV alcohol abuse in DSM-IV alcohol dependence: results of the National Epidemiologic Survey on Alcohol and Related Conditions on heterogeneity that differ by population subgroup', *Archives of General Psychiatry* 61(9), pp. 891–96.
- Hasin, D., Samet, S., Nunes, E., Meydan, J., Matseoane, K. and Waxman, R. (2006), 'Diagnosis of comorbid psychiatric disorders in substance users assessed with the Psychiatric Research Interview for Substance and Mental Disorders for DSM-IV', *The American Journal of Psychiatry* 163(4), pp. 689–96.
- Haug, N. A., Heinberg, L. J. and Guarda, A. S. (2001), 'Cigarette smoking and its relationship to other substance use among eating disordered inpatients', *Eating and Weight Disorders : EWD* 6(3), pp. 130–39.
- Havens, J. R., Ompad, D. C., Latkin, C. A., Fuller, C. M., Arria, A. M., Vlahov, D. and Strathdee, S. A. (2005), 'Suicidal ideation among African-American non-injection drug users', *Ethnicity & Disease* 15(1), pp. 110–15.
- Haver, B. (1997), 'Screening for psychiatric comorbidity among female alcoholics: the use of a questionnaire (SCL-90) among women early in their treatment programme', *Alcohol and Alcoholism* 32(6), pp. 725–30.
- Haw, C. M. and Hawton, K. (2011), 'Problem drug use, drug misuse and deliberate self-harm: trends and patient characteristics, with a focus on young people, Oxford, 1993–2006', *Social Psychiatry and Psychiatric Epidemiology* 46(2), pp. 85–93.
- Helzer, J. E. (1981), 'The use of a structured diagnostic interview for routine psychiatric evaluations', *Journal Nervous & Mental Disease* 169(1) pp. 45–9.
- Helzer, J. E. and Canino, G. J. (editors) (1992), *Alcoholism in North America, Europe, and Asia*, Oxford University Press, Oxford.
- Hermle, L., Szlak-Rubin, R., Täschner, K. L., Peukert, P. and Batra, A. (2013), '[Substance use associated disorders: frequency in patients with schizophrenic and affective psychoses]', *Der Nervenarzt* 84(3), pp. 315–25.
- Herrero, M. J., Domingo-Salvany, A., Torrens, M. and Brugal, M. T. (2008), 'Psychiatric comorbidity in young cocaine users: induced versus independent disorders', *Addiction* 103(2), pp. 284–93.
- Herzog, D. B., Franko, D. L., Dorer, D. J., Keel, P. K., Jackson, S. and Manzo, M. P. (2006), 'Drug abuse in women with eating disorders', *The International Journal of Eating Disorders* 39(5), pp. 364–68.
- Hesse, M. (2009), 'Integrated psychological treatment for substance use and co-morbid anxiety or depression vs. treatment for substance use alone. A systematic review of the published literature', *BMC Psychiatry* 9, p. 6.
- Huntley, Z., Maltezos, S., Williams, C., Morinan, A., Hammon, A., et al. (2012), 'Rates of undiagnosed attention deficit hyperactivity disorder in London drug and alcohol detoxification units', *BMC Psychiatry* 12, p. 223.
- Ilomäki, R., Riala, K., Hakko, H., Lappalainen, J., Ollinen, T., Räsänen, P. and Timonen, M. (2008), 'Temporal association of onset of daily smoking with adolescent substance use and psychiatric morbidity', *European Psychiatry* 23(2), pp. 85–91.
- Janca, A., Ustün, T. B. and Sartorius, N. (1994), 'New versions of World Health Organization instruments for the assessment of mental disorders', *Acta Psychiatrica Scandinavica* 90(2), pp. 73–83.
- Jaworski, F., Dubertret, C., Adès, J. and Gorwood, P. (2011), 'Presence of co-morbid substance use disorder in bipolar patients worsens their social functioning to the level observed in patients with schizophrenia', *Psychiatry Research* 185(1-2), pp. 129–34.
- Katzman, M. A., Bleau, P., Blier, P., Chokka, P., Kjernisted, K., et al. (2014), 'Canadian clinical practice guidelines for the management of anxiety, posttraumatic stress and obsessive-compulsive disorders', *BMC Psychiatry* 14 Suppl 1, p. S1.

- Kelly, T. M. and Daley, D. C. (2013), 'Integrated treatment of substance use and psychiatric disorders', *Social Work in Public Health* 28(3-4), pp. 388–406.
- Kelly, T. M., Daley, D. C. and Douaihy, A. B. (2012), 'Treatment of substance abusing patients with comorbid psychiatric disorders', *Addictive Behaviors* 37(1), pp. 11–24.
- Khalsa, J. H., Treisman, G., McCance-Katz, E. and Tedaldi, E. (2008), 'Medical consequences of drug abuse and co-occurring infections: research at the National Institute on Drug Abuse', *Substance Abuse* 29(3), pp. 5–16.
- Khantzian, E. J. (1985), 'The self-medication hypothesis of addictive disorders: focus on heroin and cocaine dependence', *The American Journal of Psychiatry* 142(11), pp. 1259–64.
- King, V. L., Kidorf, M. S., Stoller, K. B. and Brooner, R. K. (2000), 'Influence of psychiatric comorbidity on HIV risk behaviors: changes during drug abuse treatment', *Journal of Addictive Diseases* 19(4), pp. 65–83.
- Knight, J. R., Sherritt, L., Shrier, L. A., Harris, S. K. and Chang, G. (2002), 'Validity of the CRAFFT substance abuse screening test among adolescent clinic patients', *Archives of Pediatrics & Adolescent Medicine* 156(6), pp. 607–14.
- Kollins, S. H. (2008), 'A qualitative review of issues arising in the use of psycho-stimulant medications in patients with ADHD and co-morbid substance use disorders', *Current Medical Research and Opinion* 24(5), pp. 1345–57.
- Krausz, R. M., Clarkson, A. F., Strehlau, V., Torchalla, I., Li, K. and Schuetz, C. G. (2013), 'Mental disorder, service use, and barriers to care among 500 homeless people in 3 different urban settings', *Social Psychiatry and Psychiatric Epidemiology* 48(8), pp. 1235–43.
- Krug, I., Treasure, J., Anderluh, M., Bellodi, L., Cellini, E., et al. (2008), 'Present and lifetime comorbidity of tobacco, alcohol and drug use in eating disorders: a European multicenter study', *Drug and Alcohol Dependence* 97(1-2), pp. 169–79.
- Lacey, J. H. and Evans, C. D. (1986), 'The impulsivist: a multi-impulsive personality disorder', *British Journal of Addiction* 81(5), pp. 641–49.
- Lambert, M. T., LePage, J. P. and Schmitt, A. L. (2003), 'Five-year outcomes following psychiatric consultation to a tertiary care emergency room', *The American Journal of Psychiatry* 160(7), pp. 1350–53.
- Langås, A.-M., Malt, U. F. and Opjordsmoen, S. (2011), 'Comorbid mental disorders in substance users from a single catchment area--a clinical study', *BMC Psychiatry* 11, p. 25.
- Langås, A.-M., Malt, U. F. and Opjordsmoen, S. (2012a), 'In-depth study of personality disorders in first-admission patients with substance use disorders', *BMC Psychiatry* 12, p. 180.
- Langås, A.-M., Malt, U. F. and Opjordsmoen, S. (2012b), 'Substance use disorders and comorbid mental disorders in first-time admitted patients from a catchment area', *European Addiction Research* 18(1), pp. 16–25.
- Lecrubier, Y., Sheehan, D., Weiller, E., Amorim, P., Bonora, I., Harnett Sheehan, K., Janavs, J. and Dunbar, G. (1997), 'The Mini International Neuropsychiatric Interview (MINI). A short diagnostic structured interview: reliability and validity according to the CIDI', *European Psychiatry* 12(5), pp. 224–31.
- Leeies, M., Pagura, J., Sareen, J. and Bolton, J. M. (2010), 'The use of alcohol and drugs to self-medicate symptoms of posttraumatic stress disorder', *Depression and Anxiety* 27(8), pp. 731–36.
- Legleye, S., Karila, L., Beck, F. and Reynaud, M. (2007), 'Validation of the CAST, a general population Cannabis Abuse Screening Test', *Journal of Substance Use* 12(4), pp. 233–42.
- Leray, E., Camara, A., Drapier, D., Riou, F., Bougeant, N., et al. (2011), 'Prevalence, characteristics and comorbidities of anxiety disorders in France: results from the "Mental Health in General Population" survey (MHGP)', *European Psychiatry* 26(6), pp. 339–45.
- Levin, F. R., Bisaga, A., Raby, W., Aharonovich, E., Rubin, E., et al. (2008), 'Effects of major depressive disorder and attention-deficit/hyperactivity disorder on the outcome of treatment for cocaine dependence', *Journal of Substance Abuse Treatment* 34(1), pp. 80–89.

- Levin, F. R., Mariani, J., Brooks, D. J., Pavlicova, M., Nunes, E. V., et al. (2013), 'A randomized double-blind, placebo-controlled trial of venlafaxine-extended release for co-occurring cannabis dependence and depressive disorders', *Addiction* 108(6), pp. 1084–94.
- Lingford-Hughes, A. R., Welch, S., Peters, L. and Nutt, D. J. (2012), 'BAP updated guidelines: evidence-based guidelines for the pharmacological management of substance abuse, harmful use, addiction and comorbidity: recommendations from BAP', *Journal of Psychopharmacology* 26(7), pp. 899–952.
- Loftis, J. M., Matthews, A. M. and Hauser, P. (2006), 'Psychiatric and substance use disorders in individuals with hepatitis C: epidemiology and management', *Drugs* 66(2), pp. 155–74.
- Lukasiewicz, M., Blecha, L., Falissard, B., Neveu, X., Benyamina, A., Reynaud, M. and Gasquet, I. (2009), 'Dual diagnosis: prevalence, risk factors, and relationship with suicide risk in a nationwide sample of French prisoners', *Alcoholism, Clinical and Experimental Research* 33(1), pp. 160–68.
- Magidson, J. F., Wang, S., Lejuez, C. W., Iza, M. and Blanco, C. (2013), 'Prospective study of substance-induced and independent major depressive disorder among individuals with substance use disorders in a nationally representative sample', *Depression and Anxiety* 30(6), pp. 538–45.
- Magura, S. (2008), 'Effectiveness of dual focus mutual aid for co-occurring substance use and mental health disorders: a review and synthesis of the "double trouble" in recovery evaluation', *Substance Use & Misuse* 43(12-13), pp. 1904–26.
- Magura, S., Rosenblum, A. and Betzler, T. (2009), 'Substance use and mental health outcomes for comorbid patients in psychiatric day treatment', *Substance Abuse: Research and Treatment* 3, pp. 71–78.
- Maj, M. (2005), "'Psychiatric comorbidity": an artefact of current diagnostic systems?', *The British Journal of Psychiatry* 186, pp. 182–84.
- Maremmani, A. G. I., Dell'Osso, L., Pacini, M., Popovic, D., Rovai, L., Torrens, M., Perugi, G. and Maremmani, I. (2011), 'Dual diagnosis and chronology of illness in treatment-seeking Italian patients dependent on heroin', *Journal of Addictive Diseases* 30(2), pp. 123–35.
- Maremmani, A. G. I., Rovai, L., Rugani, F., Bacciardi, S., Dell'Osso, L. and Maremmani, I. (2014), 'Substance abuse and psychosis. The strange case of opioids', *European Review for Medical and Pharmacological Sciences* 18(3), pp. 287–302.
- Maremmani, A. G. I., Rugani, F., Bacciardi, S., Rovai, L., Massimetti, E., Gazzarrini, D., Dell'Osso, L. and Maremmani, I. (2015), 'Differentiating between the course of illness in bipolar 1 and chronic-psychotic heroin-dependent patients at their first agonist opioid treatment', *Journal of Addictive Diseases* 34(1), pp. 43–54.
- Marmorstein, N. R. (2011), 'Associations between subtypes of major depressive episodes and substance use disorders', *Psychiatry Research* 186(2-3), pp. 248–53.
- Marmorstein, N. R. (2012), 'Anxiety disorders and substance use disorders: different associations by anxiety disorder', *Journal of Anxiety Disorders* 26(1), pp. 88–94.
- Martín-Santos, R., Fonseca, F., Domingo-Salvany, A., Ginés, J. M., Ímaz, M. L., Navinés, R., Pascual, J. C. and Torrens, M. (2006), 'Dual diagnosis in the psychiatric emergency room in Spain', *The European Journal of Psychiatry* 20(3), pp. 147–56.
- Martín-Santos, R., Torrens, M., Poudevida, S., Langohr, K., Cuyás, E., et al. (2010), '5-HTTLPR polymorphism, mood disorders and MDMA use in a 3-year follow-up study', *Addiction Biology* 15(1), pp. 15–22.
- McCrone, P., Menezes, P. R., Johnson, S., Scott, H., Thornicroft, G., Marshall, J., Bebbington, P. and Kuipers, E. (2000), 'Service use and costs of people with dual diagnosis in South London', *Acta Psychiatrica Scandinavica* 101(6), pp. 464–72.
- McKenzie, M. S. and McFarland, B. H. (2007), 'Trends in antidepressant overdoses', *Pharmacoepidemiology and Drug Safety* 16(5), pp. 513–23.
- Mestre-Pintó, J. I., Domingo-Salvany, A., Martín-Santos, R. and Torrens, M. (2014), 'Dual diagnosis screening interview to identify psychiatric comorbidity in substance users: development and validation of a brief instrument', *European Addiction Research* 20(1), pp. 41–48.

- Mills, K. L., Deady, M., Proudfoot, H., Sannibale, C., Teesson, M., Mattick, R. and Burns, L. (2009), *Guidelines on the management of co-occurring alcohol and other drug and mental health conditions in alcohol and other drug treatment settings*, National Drug & Alcohol Research Centre, Sydney (available at <http://www.healthinfonet.ecu.edu.au/key-resources/promotion-resources?lid=17398>).
- Moeller, F. G., Barratt, E. S., Dougherty, D. M., Schmitz, J. M. and Swann, A. C. (2001), 'Psychiatric aspects of impulsivity', *The American Journal of Psychiatry* 158(11), pp. 1783–93.
- Moggi, F., Giovanoli, A., Buri, C., Moos, B. S. and Moos, R. H. (2010), 'Patients with substance use and personality disorders: a comparison of patient characteristics, treatment process, and outcomes in Swiss and U.S. substance use disorder programs', *The American Journal of Drug and Alcohol Abuse* 36(1), pp. 66–72.
- Morgello, S., Holzer, C. E., Ryan, E., Young, C., Naseer, M., et al. (2006), 'Interrater reliability of the Psychiatric Research Interview for Substance and Mental Disorders in an HIV-infected cohort: experience of the National NeuroAIDS Tissue Consortium', *International Journal of Methods in Psychiatric Research* 15(3), pp. 131–38.
- Mueller, T. I., Lavori, P. W., Keller, M. B., Swartz, A., Warshaw, M., et al. (1994), 'Prognostic effect of the variable course of alcoholism on the 10-year course of depression', *The American Journal of Psychiatry* 151(5), pp. 701–6.
- Neale, J., Tompkins, C. and Sheard, L. (2008), 'Barriers to accessing generic health and social care services: a qualitative study of injecting drug users', *Health & Social Care in the Community* 16(2), pp. 147–54.
- Nelson, C. B., Rehm, J., Ustün, T. B., Grant, B. and Chatterji, S. (1999), 'Factor structures for DSM-IV substance disorder criteria endorsed by alcohol, cannabis, cocaine and opiate users: results from the WHO reliability and validity study', *Addiction* 94(6), pp. 843–55.
- Ness, O., Borg, M. and Davidson, L. (2014), 'Facilitators and barriers in dual recovery: a literature review of first-person perspectives', *Advances in Dual Diagnosis* 7(3), pp. 107–17.
- NICE (2011), *Psychosis with coexisting substance misuse: assessment and management in adults and young people*, National Institute of Health and Clinical Excellence, Manchester (available at <http://www.nice.org.uk/guidance/CG120>).
- Nocon, A., Bergé, D., Astals, M., Martín-Santos, R. and Torrens, M. (2007), 'Dual diagnosis in an inpatient drug-abuse detoxification unit', *European Addiction Research* 13(4), pp. 192–200.
- Nordentoft, M., Mortensen, P. B. and Pedersen, C. B. (2011), 'Absolute risk of suicide after first hospital contact in mental disorder', *Archives of General Psychiatry* 68(10), pp. 1058–64.
- Nunes, E. V and Levin, F. R. (2004), 'Treatment of depression in patients with alcohol or other drug dependence: a meta-analysis', *JAMA* 291(15), pp. 1887–96.
- Nunes, E. V and Levin, F. R. (2006), 'Treating depression in substance abusers', *Current Psychiatry Reports* 8(5), pp. 363–70.
- Nurnberger, J. I., Blehar, M. C., Kaufmann, C. A., York-Cooler, C., Simpson, S. G., et al. (1994), 'Diagnostic interview for genetic studies. Rationale, unique features, and training. NIMH Genetics Initiative', *Archives of General Psychiatry* 51(11), pp. 849–59; discussion 863–64.
- O'Brien, M. S., Wu, L.-T. and Anthony, J. C. (2005), 'Cocaine use and the occurrence of panic attacks in the community: a case-crossover approach', *Substance Use & Misuse* 40(3), pp. 285–97.
- OASAS (2005), *Screening for co-occurring disorders using the Modified Mini Screen (MMS) Provider Implementation Plan*, New York State Office of Alcoholism and Substance Abuse Services, Albany (available at <https://www.oasas.ny.gov/treatment/COD/documents/ModMINImpl.pdf>).
- Palijan, T. Z., Muzinić, L. and Radeljak, S. (2009), 'Psychiatric comorbidity in forensic psychiatry', *Psychiatria Danubina* 21(3), pp. 429–36.
- Pani, P. P., Maremmani, I., Trogu, E., Gessa, G. L., Ruiz, P. and Akiskal, H. S. (2010), 'Delineating the psychic structure of substance abuse and addictions: should anxiety, mood and impulse-control dysregulation be included?', *Journal of Affective Disorders* 122(3), pp. 185–97.

- Pedrero-Perez, E. J., Ruiz-Sanchez de Leon, J. M., Rojo-Mota, G., Llanero-Luque, M. and Puerta-Garcia, C. (2011), '[Prevalence of attention-deficit hyperactivity disorder in substance addiction: from screening to diagnosis]', *Revista de Neurologia* 52(6), pp. 331–40.
- Pérez Gálvez, B., García Fernández, L., de Vicente Manzanaro, M. P. and Oliveras Valenzuela, M. A. (2010), '[Validation of the Psychiatric Diagnostic Screening Questionnaire (PDSQ) in a Spanish sample of alcoholic patients]', *Adicciones* 22(3), pp. 199–205.
- Pettinati, H. M., O'Brien, C. P. and Dundon, W. D. (2013), 'Current status of co-occurring mood and substance use disorders: a new therapeutic target', *The American Journal of Psychiatry* 170(1), pp. 23–30.
- Philpot, M., Pearson, N., Petratos, V., Dayanandan, R., Silverman, M. and Marshall, J. (2003), 'Screening for problem drinking in older people referred to a mental health service: a comparison of CAGE and AUDIT', *Aging & Mental Health* 7(3), pp. 171–75.
- Pierucci-Lagha, A., Gelernter, J., Feinn, R., Cubells, J. F., Pearson, D., Pollastri, A., Farrer, L. and Kranzler, H. R. (2005), 'Diagnostic reliability of the Semi-structured Assessment for Drug Dependence and Alcoholism (SSADDA)', *Drug and Alcohol Dependence* 80(3), pp. 303–12.
- Pierucci-Lagha, A., Gelernter, J., Chan, G., Arias, A., Cubells, J. F., Farrer, L. and Kranzler, H. R. (2007), 'Reliability of DSM-IV diagnostic criteria using the semi-structured assessment for drug dependence and alcoholism (SSADDA)', *Drug and Alcohol Dependence* 91(1), pp. 85–90.
- Pincus, H. A., Tew, J. D. and First, M. B. (2004), 'Psychiatric comorbidity: is more less?', *World Psychiatry* 3(1), pp. 18–23.
- Piran, N. and Gadalla, T. (2007), 'Eating disorders and substance abuse in Canadian women: a national study', *Addiction* 102(1), pp. 105–13.
- Piselli, M., Elisei, S., Murgia, N., Quartesan, R. and Abram, K. M. (2009), 'Co-occurring psychiatric and substance use disorders among male detainees in Italy', *International Journal of Law and Psychiatry* 32(2), pp. 101–7.
- Pompili, M., Innamorati, M., Lester, D., Akiskal, H. S., Rihmer, Z., et al. (2009), 'Substance abuse, temperament and suicide risk: evidence from a case-control study', *Journal of Addictive Diseases* 28(1), pp. 13–20.
- Radhakrishnan, R., Wilkinson, S. T. and D'Souza, D. C. (2014), 'Gone to pot: a review of the association between cannabis and psychosis', *Frontiers in Psychiatry* 5, p. 54.
- Ramos-Quiroga, J. A., Díaz-Digon, L., Comín, M., Bosch, R., Palomar, G., et al. (2012), 'Criteria and concurrent validity of adult ADHD section of the Psychiatry Research Interview for Substance and Mental Disorders', *Journal of Attention Disorders* doi:10.1177/1087054712454191.
- Rasmussen, K. and Levander, S. (2009), 'Untreated ADHD in adults: are there sex differences in symptoms, comorbidity, and impairment?', *Journal of Attention Disorders* 12(4), pp. 353–60.
- Reitox national focal points (n.d.), *National reports* (available at www.emcdda.europa.eu/publications/national-reports).
- Rhee, S. H., Hewitt, J. K., Lessem, J. M., Stallings, M. C., Corley, R. P. and Neale, M. C. (2004), 'The validity of the Neale and Kendler model-fitting approach in examining the etiology of comorbidity', *Behavior Genetics* 34(3), pp. 251–65.
- Riglietta, M., Beato, E., Colombo, L. and Tidone, L. (2006), 'The Italian experience (A). Drugs and psychosis in Italy: historical overview and recent perspectives', in *Co-morbidity: Perspectives across Europe* edited by J. Corkery and A. Baldacchino, European Collaborating Centres on Addiction Studies (ECCAS), London, pp. 165–85.
- Riper, H., Andersson, G., Hunter, S. B., de Wit, J., Berking, M. and Cuijpers, P. (2014), 'Treatment of comorbid alcohol use disorders and depression with cognitive-behavioural therapy and motivational interviewing: a meta-analysis', *Addiction* 109(3), pp. 394–406.
- Robins, L. N., Helzer, J. E., Ratcliff, K. S. and Seyfried, W. (1982), 'Validity of the diagnostic interview schedule, version II: DSM-III diagnoses', *Psychological Medicine* 12(4), pp. 855–70.
- Robins, L. N., Wing, J., Wittchen, H. U., Helzer, J. E., Babor, T. F., et al. (1988), 'The Composite International Diagnostic Interview: An epidemiologic instrument suitable for use in conjunction with

different diagnostic systems and in different cultures', *Archives of General Psychiatry* 45(12), pp. 1069–77.

- | Robins, L. N., Cottler, L. B., Bucholz, K. K., Compton, W. M., North, C. S. and Rourke, K. M. (2000), *Diagnostic interview schedule for the DSM-IV (DIS-IV)*, Washington University School of Medicine, St Louis.
- | Rodríguez-Jiménez, R., Aragüés, M., Jiménez-Arriero, M. A., Ponce, G., Muñoz, A., Bagney, A., Hoenicka, J. and Palomo, T. (2008), '[Dual diagnosis in psychiatric inpatients: prevalence and general characteristics]', *Investigación Clínica* 49(2), pp. 195–205.
- | Rodríguez-Llera, M. C., Domingo-Salvany, A., Brugal, M. T., Silva, T. C., Sánchez-Niubó, A. and Torrens, M. (2006), 'Psychiatric comorbidity in young heroin users', *Drug and Alcohol Dependence* 84(1), pp. 48–55.
- | Rogers, R. (2001), *Handbook of diagnostic and structured interviewing*, Guilford Press, New York.
- | Roncero, C., Ros-Cucurull, E., Daigre, C. and Casas, M. (2012), 'Prevalence and risk factors of psychotic symptoms in cocaine-dependent patients', *Actas Españolas de Psiquiatría* 40(4), pp. 187–97.
- | Roncero, C., Daigre, C., Grau-López, L., Rodríguez-Cintas, L., Barral, C., et al. (2013), 'Cocaine-induced psychosis and impulsivity in cocaine-dependent patients', *Journal of Addictive Diseases* 32(3), pp. 263–73.
- | Root, T. L., Pisetky, E. M., Thornton, L., Lichtenstein, P., Pedersen, N. L. and Bulik, C. M. (2010a), 'Patterns of co-morbidity of eating disorders and substance use in Swedish females', *Psychological Medicine* 40(1), pp. 105–15.
- | Root, T. L., Pinheiro, A. P., Thornton, L., Strober, M., Fernandez-Aranda, F., et al. (2010b), 'Substance use disorders in women with anorexia nervosa', *The International Journal of Eating Disorders* 43(1), pp. 14–21.
- | Rosenberg, S. D., Goodman, L. A., Osher, F. C., Swartz, M. S., Essock, S. M., et al. (2001), 'Prevalence of HIV, hepatitis B, and hepatitis C in people with severe mental illness', *American Journal of Public Health* 91(1), pp. 31–37.
- | Ruiz, M. A., Peters, R. H., Sanchez, G. M. and Bates, J. P. (2009), 'Psychometric properties of the Mental Health Screening form iii within a metropolitan jail', *Criminal Justice and Behavior* 36(6), pp. 607–19.
- | Sacks, S., Melnick, G., Coen, C., Banks, S., Friedmann, P. D., Grella, C., Knight, K. and Zlotnick, C. (2007), 'CJDATS Co-Occurring Disorders Screening Instrument (CODSI) for Mental Disorders (MD): A validation study', *Criminal Justice and Behavior* 34(9), pp. 1198–1216.
- | Sacks, S., Chaple, M., Sirikantraporn, J., Sacks, J. Y., Knickman, J. and Martinez, J. (2013), 'Improving the capability to provide integrated mental health and substance abuse services in a state system of outpatient care', *Journal of Substance Abuse Treatment* 44(5), pp. 488–93.
- | Salbach-Andrae, H., Lenz, K., Simmendinger, N., Klinkowski, N., Lehmkühl, U. and Pfeiffer, E. (2008), 'Psychiatric comorbidities among female adolescents with anorexia nervosa', *Child Psychiatry and Human Development* 39(3), pp. 261–72.
- | Samet, S., Fenton, M. C., Nunes, E., Greenstein, E., Aharonovich, E. and Hasin, D. (2013), 'Effects of independent and substance-induced major depressive disorder on remission and relapse of alcohol, cocaine and heroin dependence', *Addiction* 108(1), pp. 115–23.
- | San, L., Arranz, B. and Martínez-Raga, J. (2007a), 'Antipsychotic drug treatment of schizophrenic patients with substance abuse disorders', *European Addiction Research* 13(4), pp. 230–43.
- | San, L., Ciudad, A., Alvarez, E., Bobes, J. and Gilaberte, I. (2007b), 'Symptomatic remission and social/vocational functioning in outpatients with schizophrenia: prevalence and associations in a cross-sectional study', *European Psychiatry* 22(8), pp. 490–98.
- | Sansone, R. A. and Levitt, J. L. (2002), 'Self-harm behaviors among those with eating disorders: an overview', *Eating Disorders* 10(3), pp. 205–13.
- | Sansone, R. A. and Sansone, L. A. (2010), 'Psychiatric disorders: a global look at facts and figures', *Psychiatry* 7(12), pp. 16–19.

- Schier, A. R., Ribeiro, N. P., Silva, A. C., Hallak, J. E., Crippa, J. A., Nardi, A. E. and Zuardi, A. W. (2012), 'Cannabidiol, a Cannabis sativa constituent, as an anxiolytic drug', *Revista Brasileira de Psiquiatria* 34 Suppl 1, pp. S104–10.
- Schippers, G. M., Broekman, T. G., Buchholz, A., Koeter, M. W. J. and van den Brink, W. (2010), 'Measurements in the Addictions for Triage and Evaluation (MATE): an instrument based on the World Health Organization family of international classifications', *Addiction* 105(5), pp. 862–71.
- Schmidt, L. M., Hesse, M. and Lykke, J. (2011), 'The impact of substance use disorders on the course of schizophrenia—a 15-year follow-up study: dual diagnosis over 15 years', *Schizophrenia Research* 130(1-3), pp. 228–33.
- Schmoll, S., Boyer, L., Henry, J.-M. and Belzeaux, R. (2015), '[Frequent visitors to psychiatric emergency service: Demographical and clinical analysis]', *L'Encéphale* 41(2), pp. 123–29.
- Schnell, T., Neisius, K., Daumann, J. and Gouzoulis-Mayfrank, E. (2010), '[Prevalence of psychosis/ substance abuse comorbidity. Clinical-epidemiological findings from different treatment settings in a large German city]', *Der Nervenarzt* 81(3), pp. 323–28.
- Shahriyarmolki, K. and Meynen, T. (2014), 'Needs assessment of dual diagnosis: A cross-sectional survey using routine clinical data', *Drugs: Education, Prevention & Policy* 21(1), pp. 43–49.
- Sheehan, D. V., Lecrubier, Y., Sheehan, K. H., Amorim, P., Janavs, J., et al. (1998), 'The Mini-International Neuropsychiatric Interview (M.I.N.I.): the development and validation of a structured diagnostic psychiatric interview for DSM-IV and ICD-10', *The Journal of Clinical Psychiatry* 59 Suppl 2, pp. 22–33; quiz 34–57.
- Sizoo, B., van den Brink, W., Koeter, M., Gorissen van Eenige, M., van Wijngaarden-Cremers, P. and van der Gaag, R. J. (2010), 'Treatment seeking adults with autism or ADHD and co-morbid substance use disorder: prevalence, risk factors and functional disability', *Drug and Alcohol Dependence* 107(1), pp. 44–50.
- Smith, J. P. and Randall, C. L. (2012), 'Anxiety and alcohol use disorders: comorbidity and treatment considerations', *Alcohol Research : Current Reviews* 34(4), pp. 414–31.
- Sørland, T. O. and Kjelsberg, E. (2009), 'Mental health among teenage boys remanded to prisoner', *Tidsskrift for Den Norske Laegeforening* 129(23), pp. 2472–75.
- Soyka, M. (2000), 'Substance misuse, psychiatric disorder and violent and disturbed behaviour', *British Journal of Psychiatry* 176, pp. 345–50.
- Spalletta, G., Bria, P. and Caltagirone, C. (2007), 'Differences in temperament, character and psychopathology among subjects with different patterns of cannabis use', *Psychopathology* 40(1), pp. 29–34.
- Spitzer, R. L., Endicott, J. and Robins, E. (1978), 'Research diagnostic criteria: rationale and reliability', *Archives of General Psychiatry* 35(6), pp. 773–82.
- Spitzer, R. L., Williams, J. B., Gibbon, M. and First, M. B. (1992), 'The Structured Clinical Interview for DSM-III-R (SCID). I: History, rationale, and description', *Archives of General Psychiatry* 49(8), pp. 624–29.
- Spitzer, R. L., Kroenke, K. and Williams, J. B. (1999), 'Validation and utility of a self-report version of PRIME-MD: the PHQ primary care study. Primary care evaluation of mental disorders. Patient health questionnaire', *JAMA* 282(18), pp. 1737–44.
- Stahler, G. J., Mennis, J., Cotlar, R. and Baron, D. A. (2009), 'The influence of neighborhood environment on treatment continuity and rehospitalization in dually diagnosed patients discharged from acute inpatient care', *American Journal of Psychiatry* 166(11), pp. 1258–68.
- Substance Abuse and Mental Health Services Administration (2011) 'Results from the 2010 National Survey on Drug Use and Health: Summary of National Findings', NSDUH Series H-41, HHS Publication No. (SMA) 11-4658, Substance Abuse and Mental Health Services Administration, Rockville, MD.
- Swendsen, J. and Le Moal, M. (2011), 'Individual vulnerability to addiction', *Annals of the New York Academy of Sciences* 1216(1), pp. 73–85.

- Szerman, N., Arias, F., Vega, P., Babín Vich, F., Mesías Perez, B., et al. (2011), '[Pilot study on the prevalence of dual pathology in community mental health and substance misuse services in Madrid]', *Adicciones* 23(3), pp. 249–55.
- Szerman, N., Lopez-Castroman, J., Arias, F., Morant, C., Babín, F., et al. (2012), 'Dual diagnosis and suicide risk in a Spanish outpatient sample', *Substance Use & Misuse* 47(4), pp. 383–89.
- Szerman, N., Vega, P., Grau-López, L., Barral, C., Basurte-Villamor, I., et al. (2014), 'Dual diagnosis resource needs in Spain: a national survey of professionals', *Journal of Dual Diagnosis* 10(2), pp. 84–90.
- Thundiyil, J. G., Kearney, T. E. and Olson, K. R. (2007), 'Evolving epidemiology of drug-induced seizures reported to a poison control center system', *Journal of Medical Toxicology* 3(1), pp. 15–19.
- Torrens, M., Serrano, D., Astals, M., Pérez-Domínguez, G. and Martín-Santos, R. (2004), 'Diagnosing comorbid psychiatric disorders in substance abusers: validity of the Spanish versions of the Psychiatric Research Interview for Substance and Mental Disorders and the Structured Clinical Interview for DSM-IV', *The American Journal of Psychiatry* 161(7), pp. 1231–37.
- Torrens, M., Fonseca, F., Mateu, G. and Farre, M. (2005), 'Efficacy of antidepressants in substance use disorders with and without comorbid depression: A systematic review and meta-analysis', *Drug and Alcohol Dependence* 78(1), pp. 1–22.
- Torrens, M., Martín-Santos, R. and Samet, S. (2006), 'Importance of clinical diagnoses for comorbidity studies in substance use disorders', *Neurotoxicity Research* 10(3-4), pp. 253–61.
- Torrens, M., Martínez-Sanvisens, D., Martínez-Riera, R., Bulbena, A., Szerman, N. and Ruiz, P. (2011a), 'Dual diagnosis: Focusing on depression and recommendations for treatment', *Addictive Disorders & Their Treatment* 10(2), pp. 50–59.
- Torrens, M., Gilchrist, G. and Domingo-Salvany, A. (2011b), 'Psychiatric comorbidity in illicit drug users: Substance-induced versus independent disorders', *Drug and Alcohol Dependence* 113(2-3), pp. 147–56.
- Torrens, M., Rossi, P. C., Martínez-Riera, R., Martínez-Sanvisens, D. and Bulbena, A. (2012), 'Psychiatric co-morbidity and substance use disorders: Treatment in parallel systems or in one integrated system?', *Substance Use & Misuse* 47, pp. 1005–14.
- Tosato, S., Lasalvia, A., Bonetto, C., Mazzoncini, R., Cristofalo, D., et al. (2013), 'The impact of cannabis use on age of onset and clinical characteristics in first-episode psychotic patients. Data from the Psychosis Incident Cohort Outcome Study (PICOS)', *Journal of Psychiatric Research* 47(4), pp. 438–44.
- Toteva, S., Rizov, A., Tenev, V., Stoyanov, D. S. and Stoychev, K. (2006), 'The comorbidity situation in Bulgaria: epidemiological, clinical and therapeutic aspects', in *Co-morbidity: Perspectives across Europe* edited by J. Corkery and A. Baldacchino, European Collaborating Centres on Addiction Studies (ECCAS), London, pp. 133–44.
- Valderas, J. M., Starfield, B., Sibbald, B., Salisbury, C. and Roland, M. (2009), 'Defining comorbidity: implications for understanding health and health services', *Annals of Family Medicine* 7(4), pp. 357–63.
- Vallecillo, G., Mojal, S., Roquer, A., Martínez, D., Rossi, P., Fonseca, F., Muga, R. and Torrens, M. (2013), 'Risk of QTc prolongation in a cohort of opioid-dependent HIV-infected patients on methadone maintenance therapy', *Clinical Infectious Diseases* 57(8), pp. 1189–94.
- Van de Glind, G., Konstenius, M., Koeter, M. W. J., van Emmerik-van Oortmerssen, K., Carpentier, P.-J., et al. (2014), 'Variability in the prevalence of adult ADHD in treatment seeking substance use disorder patients: results from an international multi-center study exploring DSM-IV and DSM-5 criteria', *Drug and Alcohol Dependence* 134, pp. 158–66.
- Van den Bosch, L. M. and Verheul, R. (2007), 'Patients with addiction and personality disorder: Treatment outcomes and clinical implications', *Current Opinion in Psychiatry* 20(1), pp. 67–71.
- Van Emmerik-van Oortmerssen, K., van de Glind, G., Koeter, M. W. J., Allsop, S., Auriacombe, M., et al. (2014), 'Psychiatric comorbidity in treatment-seeking substance use disorder patients with and without attention deficit hyperactivity disorder: results of the IASP study', *Addiction* 109(2), pp. 262–72.

- Van Horn, J. E., Eisenberg, M. J., van Kuik, S. and van Kinderen, G. M. (2012), '[Psychopathology and recidivism among violent offenders with a dual diagnosis. A comparison with other subgroups of violent offenders]', *Tijdschrift Voor Psychiatrie* 54(6), pp. 497–507.
- Vaz Carneiro, S. and Borrego, M. (2007), '[Psychosis and substance abuse]', *Acta Médica Portuguesa* 20(5), pp. 413–22.
- Vázquez, C., Muñoz, M. and Sanz, J. (1997), 'Lifetime and 12-month prevalence of DSM-III-R mental disorders among the homeless in Madrid: a European study using the CIDI', *Acta Psychiatrica Scandinavica* 95(6), pp. 523–30.
- Vázquez, F. L. (2010), 'Psychoactive substance use and dependence among Spanish university students: prevalence, correlates, polyconsumption, and comorbidity with depression', *Psychological Reports* 106(1), pp. 297–313.
- Vázquez, F. L., Torres, Á., Otero, P. and Díaz, O. (2011), 'Prevalence, comorbidity, and correlates of DSM-IV axis I mental disorders among female university students', *The Journal of Nervous and Mental Disease* 199(6), pp. 379–83.
- Vergara-Moragues, E., González-Saiz, F., Lozano, O. M., Betanzos Espinosa, P., Fernández Calderón, F., Bilbao-Acebos, I., Pérez García, M. and Verdejo García, A. (2012), 'Psychiatric comorbidity in cocaine users treated in therapeutic community: substance-induced versus independent disorders', *Psychiatry Research* 200(2-3), pp. 734–41.
- Vorspan, F., Brousse, G., Bloch, V., Bellais, L., Romo, L., Guillem, E., Coeuru, P. and Lépine, J.-P. (2012), 'Cocaine-induced psychotic symptoms in French cocaine addicts', *Psychiatry Research* 200(2-3), pp. 1074–76.
- Weaver, T., Madden, P., Charles, V., Stimson, G., Renton, A. et al. (2003) 'Comorbidity of substance misuse and mental illness in community mental health and substance misuse services', *The British Journal of Psychiatry* 183 (4), pp. 304–13.
- Weissman, M. M., Olfson, M., Leon, A. C., Broadhead, W. E., Gilbert, T. T., et al. (1995), 'Brief diagnostic interviews (SDDS-PC) for multiple mental disorders in primary care. A pilot study', *Archives of Family Medicine* 4(3), pp. 220–27.
- Whiteford, H. A., Degenhardt, L., Rehm, J., Baxter, A. J., Ferrari, A. J., et al. (2013), 'Global burden of disease attributable to mental and substance use disorders: Findings from the Global Burden of Disease Study 2010', *The Lancet* 382(9904), pp. 1575–86.
- WHO (1990), *Composite International Diagnostic Interview (CIDI, Version 1.0)*, World Health Organization, Geneva.
- WHO (1992), *International statistical classification of diseases and related health problems*, World Health Organization, Geneva.
- WHO (1998), *Composite International Diagnostic Interview (CIDI Core, Version 2.1)*, WHO, Geneva.
- WHO (2010), *Lexicon of alcohol and drug terms published by the World Health Organization* (http://www.who.int/substance_abuse/terminology/who_lexicon/en/), retrieved 5 August 2015.
- WHO ASSIST (2002), 'The Alcohol, Smoking and Substance Involvement Screening Test (ASSIST): development, reliability and feasibility', *Addiction* 97(9), pp. 1183–94.
- Wiederman, M. W. and Pryor, T. (1996), 'Substance use and impulsive behaviors among adolescents with eating disorders', *Addictive Behaviors* 21(2), pp. 269–72.
- Wilens, T. E. and Biederman, J. (2006), 'Alcohol, drugs, and attention-deficit/ hyperactivity disorder: a model for the study of addictions in youth', *Journal of Psychopharmacology* 20(4), pp. 580–88.
- Wilens, T. E., Adamson, J., Monuteaux, M. C., Faraone, S. V., Schillinger, M., Westerberg, D. and Biederman, J. (2008), 'Effect of prior stimulant treatment for attention-deficit/hyperactivity disorder on subsequent risk for cigarette smoking and alcohol and drug use disorders in adolescents', *Archives of Pediatrics & Adolescent Medicine* 162(10), pp. 916–21.
- Wing, J. (1996), 'SCAN and the PSE tradition', *Social Psychiatry and Psychiatric Epidemiology* 31(2), pp. 50–54.
- Wing, J. K., Babor, T., Brugha, T., Burke, J., Cooper, J. E., et al. (1990), 'SCAN. Schedules for Clinical Assessment in Neuropsychiatry', *Archives of General Psychiatry* 47(6), pp. 589–93.

- | Wittchen, H.-U., Fröhlich, C., Behrendt, S., Günther, A., Rehm, J., Zimmermann, P., Lieb, R. and Perkonig, A. (2007), 'Cannabis use and cannabis use disorders and their relationship to mental disorders: a 10-year prospective-longitudinal community study in adolescents', *Drug and Alcohol Dependence* 88 Suppl 1, pp. S60–70.
- | Wobrock, T. and Soyka, M. (2009), 'Pharmacotherapy of patients with schizophrenia and substance abuse', *Expert Opinion on Pharmacotherapy* 10(3), pp. 353–67.
- | WPA (2014), *Dual disorders/pathology* (http://www.wpanet.org/detail.php?section_id=11&content_id=1206), retrieved 5 August 2015.
- | Wüsthoff, L. E., Waal, H., Ruud, T. and Gräwe, R. W. (2011), 'A cross-sectional study of patients with and without substance use disorders in community mental health centres', *BMC Psychiatry* 11, p. 93.
- | Wüsthoff, L. E., Waal, H. and Gräwe, R. W. (2014), 'The effectiveness of integrated treatment in patients with substance use disorders co-occurring with anxiety and/or depression--a group randomized trial', *BMC Psychiatry* 14, p. 67.
- | Zimmerman, M. and Chelminski, I. (2006), 'A scale to screen for DSM-IV Axis I disorders in psychiatric out-patients: performance of the Psychiatric Diagnostic Screening Questionnaire', *Psychological Medicine* 36(11), pp. 1601–11.
- | Zimmerman, M. and Mattia, J. I. (2001), 'The Psychiatric Diagnostic Screening Questionnaire: development, reliability and validity', *Comprehensive Psychiatry* 42(3), pp. 175–89.
- | Zimmerman, M., Sheeran, T., Chelminski, I. and Young, D. (2004), 'Screening for psychiatric disorders in outpatients with DSM-IV substance use disorders', *Journal of Substance Abuse Treatment* 26(3), pp. 181–88.

HOW TO OBTAIN EU PUBLICATIONS

Free publications

one copy:

via EU Bookshop (<http://bookshop.europa.eu>)

more than one copy or posters/maps:

from the European Union's representations

(http://ec.europa.eu/represent_en.htm);

from the delegations in non-EU countries

(http://eeas.europa.eu/delegations/index_en.htm);

by contacting the Europe Direct service

(http://europa.eu/europedirect/index_en.htm) or

calling 00 800 6 7 8 9 10 11

(freephone number from anywhere in the EU) (*).

(* The information given is free, as are most calls (though some operators, phone boxes or hotels may charge you).

Priced publications

via EU Bookshop (<http://bookshop.europa.eu>)



About the EMCDDA

The European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) is the central source and confirmed authority on drug-related issues in Europe. For over 20 years, it has been collecting, analysing and disseminating scientifically sound information on drugs and drug addiction and their consequences, providing its audiences with an evidence-based picture of the drug phenomenon at European level.

The EMCDDA's publications are a prime source of information for a wide range of audiences including: policymakers and their advisors; professionals and researchers working in the drugs field; and, more broadly, the media and general public. Based in Lisbon, the EMCDDA is one of the decentralised agencies of the European Union.

About this series

EMCDDA Insights are topic-based reports that bring together current research and study findings on a particular issue in the drugs field. This publication looks at the co-occurrence of drug use problems and mental health disorders, taking in the theoretical background of psychiatric comorbidity, the tools for clinical diagnosis and the prevalence and clinical relevance of the problem in Europe.

