Chapter Two: The Reality of Substance Use Disorder

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1. Overview of Substance Use Disorder

Substance use disorder is a significant global public health issue. According to the World Health Organization (WHO), approximately 1.8% of the global disease burden was attributable to substance use disorders in 2012, with 1.2% linked to alcohol use disorders and 0.6% to drug use disorders. In 2013, around 27 million people worldwide suffered from drug use disorders, nearly 50% of whom injected drugs, and an estimated 1.65 million were living with HIV. Since 2006, the number of people using illicit drugs has risen by 38 million, reaching 246 million in 2013. The burden of substance use disorders varies significantly by region (Figure 1). For instance, the disability-adjusted life year (DALY)—a measure combining the years of life lost due to premature mortality and the years lived with disability—rate for low-, middle-, and non-OECD (Organisation for Economic Co-operation and Development) high-income countries in the European Region is five times higher than that of the Eastern Mediterranean Region, where alcohol consumption is banned in many countries (WHO 2015, pp. 155–156).

Before delving into the classifications of SUD, it is important to clarify the notion of a substance. A substance is any natural or synthesised product that has psychoactive effects, altering perceptions, thoughts, emotions, and behaviours (Nolen-Hoeksema 2014, p. 396). Importantly, using a substance does not inherently indicate that an individual has SUD.

To gain a comprehensive understanding of SUD, one must explore its classification systems as outlined in the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) and the International Classification of Diseases, Eleventh Revision (ICD-11). The DSM-5, issued by the American Psychiatric Association (APA), serves as the primary classification tool for mental disorders in clinical practice, research, policymaking, and reimbursement within the United States. Conversely, the ICD-11, published by the WHO, serves as a global standard for classifying diseases, including mental disorders.

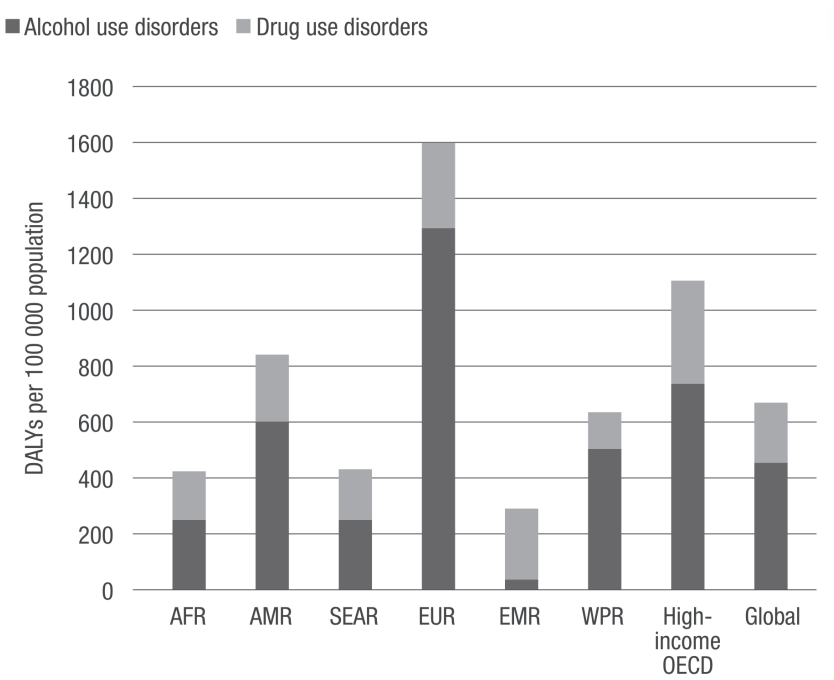

Figure 1: DALYs for substance use disorders by region and globally, 2012 (WHO 2015, p. 156).

This chapter will cover the classification of SUD according to DSM-5 and ICD-11 criteria, various theories regarding SUD, and the available treatments for this mental disorder.

2. DSM-5

Throughout the history of DSM criteria, four conditions have been pivotal in defining individuals' substance use: intoxication, withdrawal, abuse, and dependence. In DSM-5, substance abuse and dependence were consolidated into a single diagnosis—substance use disorder—due to challenges in distinguishing between abuse and dependence in clinical and research settings and the low reliability of the substance abuse diagnosis. This new diagnosis combines the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV; with the release of the DSM-5, the APA

switched Roman numerals to Arabic numerals to allow for easier updates and revisions.) categories of substance abuse and substance dependence into a single disorder measured on a continuum from mild to severe. Each specific substance (except caffeine, which cannot be diagnosed as a substance use disorder) is addressed as a separate use disorder (e.g. alcohol use disorder, stimulant use disorder), but nearly all substances are diagnosed based on the same overarching criteria. In this unified disorder, the criteria have been both combined and strengthened. In DSM-IV, a diagnosis of substance abuse required only one symptom, whereas a mild substance use disorder in DSM-5 requires two to three symptoms from a list of eleven. Drug craving has been added to the list, while problems with law enforcement have been removed due to cultural considerations that make this criterion difficult to apply internationally.

In DSM-IV, abuse and dependence were differentiated, with abuse seen as an early or mild phase and dependence as a more severe manifestation. However, the severity of abuse criteria could overlap substantially with those of dependence. The revised DSM-5 diagnosis of substance use disorder aligns more closely with patients' symptomatic experiences, streamlining clinical understanding.

Moreover, the diagnosis of dependence often caused confusion, as it was commonly associated with 'addiction', despite dependence being a potential normal physiological response to a substance (APA 2013; Hasin et al. 2013; Nolen-Hoeksema 2014). ***Substance Intoxication***

Substance intoxication involves behavioural and psychological changes due to the physiological effects of a substance on the central nervous system. Individuals become intoxicated soon after ingesting a substance, with the level of intoxication increasing with the amount consumed. Intoxication decreases as the substance levels in the blood or tissue decline, but symptoms may persist for hours or days after the substance is no longer detectable in the body. Specific symptoms of intoxication depend on the substance taken, its dosage, the user's tolerance, and the context of use. A diagnosis of substance intoxication is given only when the behavioural and psychological changes significantly disrupt social and family relationships, cause occupational or financial problems, or place the individual at significant risk for adverse effects such as traffic accidents, severe medical complications, or legal issues. Substance intoxication is common among individuals with a substance use disorder but can also occur in those without one (Nolen-Hoeksema 2014, p. 398).

Substance Withdrawal

Substance withdrawal involves physiological and behavioural symptoms arising when heavy, prolonged substance use is abruptly reduced or discontinued. These symptoms typically oppose those of intoxication and must cause significant distress or functional impairment for diagnosis (Nolen-Hoeksema 2014, pp. 398–399).

Substance Abuse

Substance abuse was diagnosed when recurrent use of a substance led to significant harmful consequences in four categories: failing to fulfil important obligations at work, school, or home; using the substance in physically hazardous situations, such as while driving; encountering legal problems due to substance use, such as arrests for drunk driving or possession of illegal substances; and continuing to use the substance despite recurrent social or legal problems. DSM-IV required that the person show repeated problems in at least one of these categories within a twelve-month period to be diagnosed with substance abuse (Nolen-Hoeksema 2014, p. 399).

Substance Dependence

The diagnosis of substance dependence in DSM-IV was closest to what people often refer to as drug addiction. Those dependent on a substance frequently show tolerance—they experience diminished effects from the same dose and need increasingly larger amounts to achieve intoxication. For instance, long-term smokers may need more than 20 cigarettes a day, an amount that would have made them ill when they first started smoking. A person highly tolerant of a substance might have very high blood levels without feeling its effects. The risk for tolerance varies greatly among substances (Nolen-Hoeksema 2014, p. 399).

DSM-5 Criteria for SUD

DSM-5 criteria for substance use disorder encompass impaired control, social impairment, risky use, and pharmacological criteria, requiring the

presence of two or more symptoms within a year for diagnosis (see Figure 2). Severity is classified as mild (two to three criteria), moderate (four to five), or severe (six or more) (APA 2013; Nolen-Hoeksema 2014).

Impaired centre control

1. The substance is taken in increasingly larger amounts or over a longer period of time than originally intended.
2. The substance user craves the use of the substance.
3. The substance user feels an ongoing desire to cut down or control substance abuse.
4. Much time is spent in obtaining, using, or recovering from the substance.

Social impairment

5. The ongoing use of the substance often results in an inability to meet responsibilities at home, work, or school.
6. Important social, work-related, or recreational activities are abandoned or cut back because of substance use.
7. Ongoing substance use despite recurring social or relationship difficulties caused or made worse by the effects of the substance.

Risky use

8. Ongoing substance use in physically dangerous situations such as driving a car or operating machinery.
9. Substance use continues despite the awareness of ongoing physical or psychological problems that have likely arisen or been made worse by the substance.

Pharmacological criteria

10. Changes in the substances user's tolerance of the substance is indicated by the need for increased amounts of the substance to achieve the desired effect or by a diminished experience of intoxication over time with the same amount of the substance.
11. Withdrawal is demonstrated by the characteristic withdrawal syndrome of the substance and/or taking the same or similar substance to relieve withdrawal symptoms.

Figure 2: Criteria for substance use disorder in DSM-5 (Nolen-Hoeksema 2014, p. 400).

DSM-5 identifies ten substance classes linked to substance use disorder: alcohol, stimulants (including cocaine), caffeine, cannabis, hallucinogens and phencyclidine (PCP), inhalants, opioids, sedatives/hypnotics/anxiolytics, tobacco, and other/unknown substances (APA 2013; Nolen-Hoeksema 2014).

Section Conclusion

In summary, the evolution of DSM criteria for substance use disorder reflects an effort to improve diagnostic accuracy and reliability. The transition from DSM-IV to DSM-5 marks a significant shift in how substance use disorders are defined and categorised, emphasising a continuum of severity and consolidating previous distinctions between abuse and dependence. By focusing on a unified set of criteria, DSM-5 aims to provide a clearer, more comprehensive understanding of substance use disorders, facilitating better diagnosis and treatment across diverse clinical settings.

3. ICD-11 Criteria for SUD

In ICD-11, the term 'disorders due to substance use' is used similarly to the term 'substance use disorder' in DSM-5. These disorders encompass conditions resulting from the single or repeated use of substances with psychoactive properties, including certain medications. Typically, initial use of these substances produces pleasant or appealing psychoactive effects that are rewarding and reinforcing with repeated use. With continued use, many of these substances have the potential to produce dependence and cause various forms of harm to both mental and physical health. Additionally, the harmful non-medical use of non-psychoactive substances is also included in this category.

Disorders due to substance use are classified by first identifying the specific substance used. In ICD-11, there are 18 substance classes: alcohol, cannabis, synthetic cannabinoids, opioids, sedatives/hypnotics/anxiolytics, cocaine, stimulants (including amphetamines, methamphetamine, or methcathinone), synthetic cathinones, caffeine, hallucinogens, nicotine, volatile inhalants, 3,4-methylenedioxymethamphetamine (MDMA) or related drugs (including 3,4-methylenedioxyamphetamine, MDA), ketamine and phencyclidine (PCP), other specified psychoactive substances (including medications), multiple specified psychoactive substances (including medications), unknown or unspecified psychoactive substances, and non-psychoactive substances.

In summary, ICD-11's approach to disorders due to substance use aligns closely with DSM-5's category of substance use disorders. It emphasises the potential for dependence and the associated mental and physical health risks of both psychoactive and non-psychoactive substances (WHO 2021).

4. Theories of SUD

Understanding SUD involves exploring a complex interplay of factors. This section delves into the biological, psychological, and sociocultural factors and gender differences that contribute to the development and progression of SUD.

Biological Factors

The brain's 'pleasure pathway' plays a significant role in shaping our experience of reward and reinforcement. This pathway originates in the ventral tegmental area of the midbrain, extends through the nucleus accumbens in the limbic system, and reaches into the frontal cortex. It is densely populated with neurons sensitive to dopamine, a neurotransmitter crucial for reward processing. Various regions of the frontal cortex, including the orbitofrontal cortex, dorsolateral frontal cortex, and inferior frontal gyrus, are essential for regulating impulses and managing the urge to use alcohol or drugs. When the reward system overrides the control network, it can heighten the inclination towards substance use, potentially contributing to the development of substance use disorders by disrupting impulse control and decision-making.

As substance use continues, the brain undergoes changes that further entrench the cycle of addiction. Although prolonged substance use leads to decreased sensitivity to the substance's rewarding effects, individuals become more sensitive to cues associated with their substance use, like specific locations or paraphernalia. These conditioned responses to drug-related cues can trigger intense cravings, potentially leading to relapse. Additionally, stress activates reward systems, further enhancing cravings. Chronic drug use also disrupts activity in the brain's frontal regions involved in impulse control, making it even more challenging for individuals to resist these cravings.

Genetic factors also significantly influence the neurotransmitter systems involved in the rewarding effects of substances. Family, adoption, and twin studies collectively suggest that genetics contribute to about 50% of the variability in the risk of substance use disorders. There appears to be a shared genetic vulnerability to substance use disorders in general, rather than to specific substances, explaining why individuals prone to one substance are often susceptible to others. Research on genes controlling the dopamine system, particularly variations in the dopamine receptor gene (DRD2) and dopamine transporter gene (SLC6A3), underscores their impact on how the brain processes dopamine and perceives substances like nicotine. Additionally, genes governing gamma-aminobutyric acid (GABA) have implications for substance use disorders, notably in alcohol use (Nolen-Hoeksema 2014, pp. 417–418).

Psychological Factors

Social learning theories propose that children and adolescents may adopt substance use behaviours by observing their parents and significant others within their culture. Even at the preschool age, children of heavy drinkers are more likely than their peers to recognise alcoholic beverages and perceive alcohol consumption as a routine part of daily life. When parents frequently get drunk or drive while intoxicated, they inadvertently teach their children that these behaviours are acceptable, increasing the likelihood that the children will engage in similar behaviours.

Cognitive theories of alcohol use disorders emphasise the role of individuals' expectations of alcohol's effects and their beliefs about the appropriateness of using it to cope with stress. People who believe that alcohol will alleviate their distress and who lack more adaptive coping mechanisms (such as problem-solving skills or supportive relationships) are more inclined to drink alcohol when upset, leading to social problems associated with drinking. Longitudinal studies of the sons of parents with alcohol use disorders have shown that men who use alcohol to cope and relax are more likely to develop alcohol use disorders themselves.

A constant personality trait consistently linked to a higher risk of substance use disorders is behavioural undercontrol, which is characterised by impulsivity, sensation-seeking, and a propensity for antisocial behaviours, such as breaking laws. Individuals with high levels of behavioural undercontrol tend to experiment with psychoactive drugs at an earlier age, consume larger quantities, and are more likely to be diagnosed with substance use disorders. This trait is strongly familial, and twin studies suggest that genetic factors partly contribute to it. Consequently, genetics may influence behavioural undercontrol, which in turn affects the likelihood of developing substance use disorders (Nolen-Hoeksema 2014, pp. 418–419).

Sociocultural Factors

The reinforcing effects of substances, such as the highs produced by stimulants and the calming effects of depressants and opioids, can be particularly appealing to individuals experiencing chronic stress. Consequently, rates of substance use disorders are higher among people living in poverty, women in abusive relationships, and adolescents whose parents frequently engage in violent conflicts. For these individuals, the effects of substances may

seem especially rewarding, and they may feel they have little to lose by using them.

Environmental factors, including societal attitudes toward substance use, also shape consumption patterns. Societies that strongly discourage alcohol use, often due to religious beliefs, tend to have lower rates of alcohol abuse and dependence. Conversely, cultures like many in Europe permit moderate alcohol consumption but discourage excessive drinking and irresponsible behaviour while intoxicated, resulting in lower prevalence of alcohol-related disorders (Nolen-Hoeksema 2014, p. 419).

Gender Differences

In many cultures, substance use, particularly alcohol use, tends to be more socially acceptable for men. Heavy drinking is often associated with traditional notions of masculinity and is frequently modelled by cultural icons and heroes. In contrast, heavy drinking by women was historically viewed as inappropriate. However, societal acceptance of heavy drinking among women has increased in recent generations, leading to a rise in alcohol use among young women.

Despite this shift, women generally exhibit fewer risk factors for substance use disorders compared to men. They are less likely to display personality traits such as behavioural undercontrol and sensation-seeking, which are linked to substance use disorders. Additionally, women are less likely to use alcohol to alleviate distress and less likely to expect positive outcomes from drug consumption.

When individuals develop substance use disorders, patterns and reasons for use can differ based on gender. Men typically begin using substances in social settings with friends, whereas women are more often introduced to substance use by family members, partners, or significant others. Because women's substance use is more closely tied to their intimate relationships, treatments that involve their partners tend to be more effective in reducing substance use disorders among women (Nolen-Hoeksema 2014, pp. 419–420).

5. Available Treatments for SUD

Treating substance-related disorders is challenging, and media stories about celebrities repeatedly entering and exiting rehab underscore the difficulties

in achieving lasting success. In this section, we review the most common and well-supported biological and psychosocial treatments.

Biological Treatments

Medications can help individuals withdraw from substances, reduce cravings, and maintain controlled use. These treatments include antianxiety drugs, antidepressants, and drug antagonists.

Antianxiety Drugs, Antidepressants, and Drug Antagonists

For some individuals, emotional support is enough to manage withdrawal symptoms. However, others may require medication. Benzodiazepines, which have similar depressant effects to alcohol, can help those dependent on alcohol by reducing tremors, anxiety, pulse, and respiration rate, as well as stabilising blood pressure. The dosage is decreased daily to avoid dependence on benzodiazepines.

Antidepressants are sometimes prescribed for individuals with both substance dependence and depression; however, their effectiveness without accompanying psychotherapy is inconsistent. Responses to selective serotonin reuptake inhibitors (SSRIs)—a class of antidepressants that increase serotonin levels in the brain—can vary significantly from person to person. Antagonist drugs, which block or alter the effects of addictive substances, help reduce cravings. Naltrexone and naloxone, both opioid antagonists, block the effects of opioids like heroin, theoretically reducing the desire and likelihood of use. These drugs, however, must be administered cautiously due to the potential for severe withdrawal symptoms. Naltrexone also helps treat alcohol dependence by blocking endorphins released during drinking, which reduces cravings and alcohol consumption. Acamprosate, another medication, works on glutamate and GABA receptors implicated in alcohol cravings, and has been shown to help maintain abstinence better than a placebo. Disulfiram (Antabuse) discourages alcohol consumption by causing unpleasant effects such as nausea and dizziness, but it requires strong motivation for continuous use (Nolen-Hoeksema 2014, p. 420).

Methadone Maintenance Programmes

Gradual withdrawal from heroin can be managed with methadone, an opioid that produces less potent and shorter-lasting effects than heroin when taken orally. Methadone helps alleviate severe withdrawal symptoms for individuals dependent on heroin. Additionally, if heroin is used while on methadone, its intense psychological effects are blocked because methadone occupies the same receptors. Although the ultimate goal is to wean patients off methadone, some individuals remain on it for years under medical supervision.

Methadone maintenance programmes are controversial. Critics argue that these programmes merely substitute one dependency for another, albeit a legal one provided by a physician. However, proponents contend that methadone maintenance is essential for preventing heroin-dependent individuals from relapsing and returning to street drug use (Nolen-Hoeksema 2014, pp. 420–421).

Psychosocial Treatments

Several behavioural and cognitive techniques have proven effective in treating substance use disorders. These techniques share common goals. The first goal is to motivate the individual to stop using the addictive substance. People who enter treatment are often ambivalent about quitting and may have been coerced into treatment. The second goal is to teach patients new coping skills to replace substance use as a way to manage stress and negative emotions. The third goal is to change the reinforcements for substance use, such as encouraging individuals to disengage from social circles that promote drug use. The fourth goal is to enhance support from non-using friends and family members. Finally, fostering adherence to pharmacotherapies in conjunction with psychotherapy is crucial (Nolen-Hoeksema 2014, p. 421).

Behavioural Treatments

Behavioural treatments often use aversive classical conditioning, either alone or with other therapies. For instance, disulfiram (Antabuse) makes alcohol consumption unpleasant or toxic, leading to conditioned responses

of nausea and vomiting. Through operant conditioning, individuals learn to avoid alcohol to prevent these aversive reactions. Although aversive conditioning can reduce alcohol consumption in the short term, 'booster' sessions may be needed to maintain its effectiveness over time.

Covert sensitisation therapy uses imagery to create negative associations with alcohol use, effectively reducing alcohol consumption. Contingency management programmes provide reinforcements, such as employment, housing, or vouchers, for abstaining from substances. Studies show that individuals dependent on heroin, cocaine, marijuana, or alcohol are more likely to remain in treatment and achieve abstinence when given incentives contingent on drug-free urine specimens (Nolen-Hoeksema 2014, pp. 421–422).

Cognitive Treatments

Cognitive interventions help clients identify situations where they are most likely to drink and lose control, as well as explore their expectation that alcohol will help them cope in difficult situations. Therapists challenge these expectations by reviewing the negative effects alcohol has on behaviour. For example, if a client drank heavily at a party due to anxiety, the therapist might have the client recount any embarrassing behaviour while intoxicated, challenging the notion that alcohol was helpful. Therapists also teach clients to handle stress in adaptive ways, such as seeking help from others or engaging in active problem-solving. Additionally, clients learn to decline alcohol and handle social pressure using assertiveness skills.

In most cases, cognitive-behavioural therapists encourage abstinence, especially for clients with a history of frequent relapses. If a client aims to drink socially and the therapist believes this is achievable, therapy may focus on teaching controlled drinking. Studies have shown that cognitive-behavioural approaches are effective for treating abuse of and dependence on alcohol, cannabis, nicotine, heroin, amphetamines, and cocaine (Nolen-Hoeksema 2014, pp. 422–423).

6. Conclusion

Substance use disorder is a complex and multifaceted issue that affects millions of people worldwide. The evolution of diagnostic criteria from

DSM-IV to DSM-5, as well as the comprehensive classification in ICD-11, underscores the importance of accurate diagnosis and treatment. Understanding the biological, psychological, sociocultural, and gender-related factors that contribute to SUD is crucial for developing effective interventions. By addressing these factors and utilising both biological and psychosocial treatments, we can better support individuals in overcoming SUD and improving their quality of life.

This chapter has highlighted the significant changes in the diagnostic criteria for SUD, the underlying theories explaining the disorder, and the various treatment options available. Moving forward, continued research and a compassionate approach are essential in confronting the stigma and challenges associated with SUD, ultimately breaking the silence and fostering a more supportive environment for those affected.

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