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Anxiety and depression among drug addicts: A systematic review

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Abstract

To comprehensively examine and synthesize existing research on the prevalence and impact of anxiety and depression among individuals with drug addiction. A comprehensive search across four databases identified 1,411 publications. Duplicates were removed using Rayyan QCRI, and relevance screening reduced the selection to 104 full-text articles. After further review, six studies met the inclusion criteria. We included six studies with a total of 2,612 drug addicts, and the majority, 2,051 (78.5%), were males. The findings consistently indicated a higher prevalence of anxiety and depression among individuals with substance use disorders (SUDs) compared to the general population. Several studies highlighted that the severity of substance use was directly correlated with the severity of anxiety and depression. Environmental and socio-economic factors also played a significant role in the prevalence and intensity of these mental health conditions. The systematic review emphasizes the profound impact of substance use on the prevalence and severity of anxiety and depression. Future research should focus on longitudinal studies to explore the causal relationships and assess the long-term effectiveness of integrated treatment models. The findings advocate for integrated treatment approaches that address both substance use and mental health issues concurrently.

Keywords: Anxiety, Depression, Mental health, Substance use disorders, Systematic review.

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1. Introduction

Substance abuse is a significant global public health issue. According to the 2019 World Drug Report by the UN Office on Drugs and Crime, around 35 million people globally were affected by substance use disorders, with approximately 585,000 deaths attributed to drug abuse in 2017 [1]. Research indicates that drug addiction accounts for 7.4% of the global disease burden, surpassing diseases such as AIDS, tuberculosis, and diabetes [2].

Addiction damages the central nervous system, impairing cognitive control and leading to intense cravings and a severe lack of self-control during withdrawal. Addiction is characterized as a cyclical pattern of escalating dysregulation within the brain's reward systems, leading to compulsive substance use and a diminished ability to control drug consumption. The onset of addiction engages various sources of reinforcement, distinct neuroadaptive processes, and diverse neurochemical alterations that contribute to the dysregulation of the brain's reward system [3, 4]. Engaging in activities such as eating, drinking, and sexual intercourse stimulates the reward system, resulting in significant neuronal communication within this structure. This internal interaction triggers the release of dopamine. However, the use of substances results in a dopamine release that greatly exceeds that of natural activities like eating and sexual intercourse. The dopamine released generates immediate yet fleeting sensations of pleasure and euphoria [5]. Drug dependence affects the midbrain dopamine system by both promoting dopamine release and blocking its reuptake [6], which increases dopamine receptor activity and enhances dopamine function, ultimately reinforcing drug use [7]**.**

Reduction or cessation of drug use triggers withdrawal syndrome, presenting as a range of physical and mental symptoms, with depression and anxiety being prominent [8, 9]. These symptoms challenge the detoxification process and heighten the risk of relapse. In extreme cases, individuals with substance abuse issues may experience suicidal thoughts and risk life-threatening consequences [10].

The interrelation between drug addiction and mental health disorders, particularly anxiety and depression, has garnered considerable attention in clinical research. Drug addiction not only precipitates neuropsychological impairments but also extensively affects emotional and psychological well-being. Existing literature indicates that individuals with substance use disorders exhibit markedly higher incidences of anxiety and depression compared to the general population. These mental health challenges can complicate treatment for addiction, increase the risk of relapse, and significantly impair quality of life. However, the mechanisms underlying these associations, the effectiveness of various treatment modalities, and the course of these psychiatric symptoms in the context of substance abuse require further elucidation. Systematic reviews on this topic are crucial as they consolidate findings from various studies, identify gaps in the current knowledge, and suggest directions for future research.

The primary objective of this systematic review is to comprehensively examine and synthesize existing research on the prevalence and impact of anxiety and depression among individuals with drug addiction.

2. Methods

2.1. Search Strategy

The systematic review adhered to the PRISMA and GATHER guidelines. A comprehensive search was performed to gather studies focusing on the prevalence and impact of anxiety and depression in individuals with drug addiction. The search utilized four electronic databases: SCOPUS, Web of Science, Cochrane, and PubMed. Duplicate entries were eliminated, and the titles and abstracts retrieved through these searches were uploaded to Rayyan for review. The review included studies published from 2020 to 2025. Subsequently, studies that met the inclusion criteria, as determined from their titles and abstracts, were selected for full-text review. Two reviewers independently assessed the relevance of the full texts and resolved any differences through discussion.

2.2. Study Population—Selection

The PEO (Population, Exposure, and Outcome) factors were implemented as inclusion criteria for our review: (i) Population: The population of interest includes individuals diagnosed with drug addiction; (ii) Exposure: The exposure in this review refers to the experience of drug addiction; (iii) Outcome: The outcomes to be measured are the prevalence and severity of anxiety and depression among the drug-addicted population. Additional outcomes might include the impact of these mental health conditions.

2.3. Data Extraction

Data from studies that satisfied the inclusion requirements were extracted by two objective reviewers using a predetermined and uniform methodology. The following information was retrieved and recorded: (i) First author, (ii) Year of publication, (iii) Study design, (iv) Country, (v) Sample size, (vi) Age, (vii) Gender, (viii) Diagnostic tool for depression, (ix) Diagnostic tool for anxiety, (x) Prevalence of anxiety (%), (xi) Prevalence of depression, and (xii) Main outcomes.

2.4. Quality Review

Since bias resulting from omitted factors is frequent in studies in this field, we used the ROBINS-I technique to assess the likelihood of bias, as it enables a thorough examination of confounding. The ROBINS-I tool can be used for cohort designs where individuals exposed to different staffing levels are tracked over time and is designed to assess non-randomized studies. Each paper's risk of bias was evaluated independently by two reviewers, and any differences were resolved through group discussion [11].

3. Results

The specified search strategy yielded 1411 publications Figure 1. After removing duplicates (n = 704), 707 trials were evaluated based on title and abstract. Of these, 599 failed to satisfy eligibility criteria, leaving just 104 full-text articles for comprehensive review. A total of 6 satisfied the requirements for eligibility with evidence synthesis for analysis.

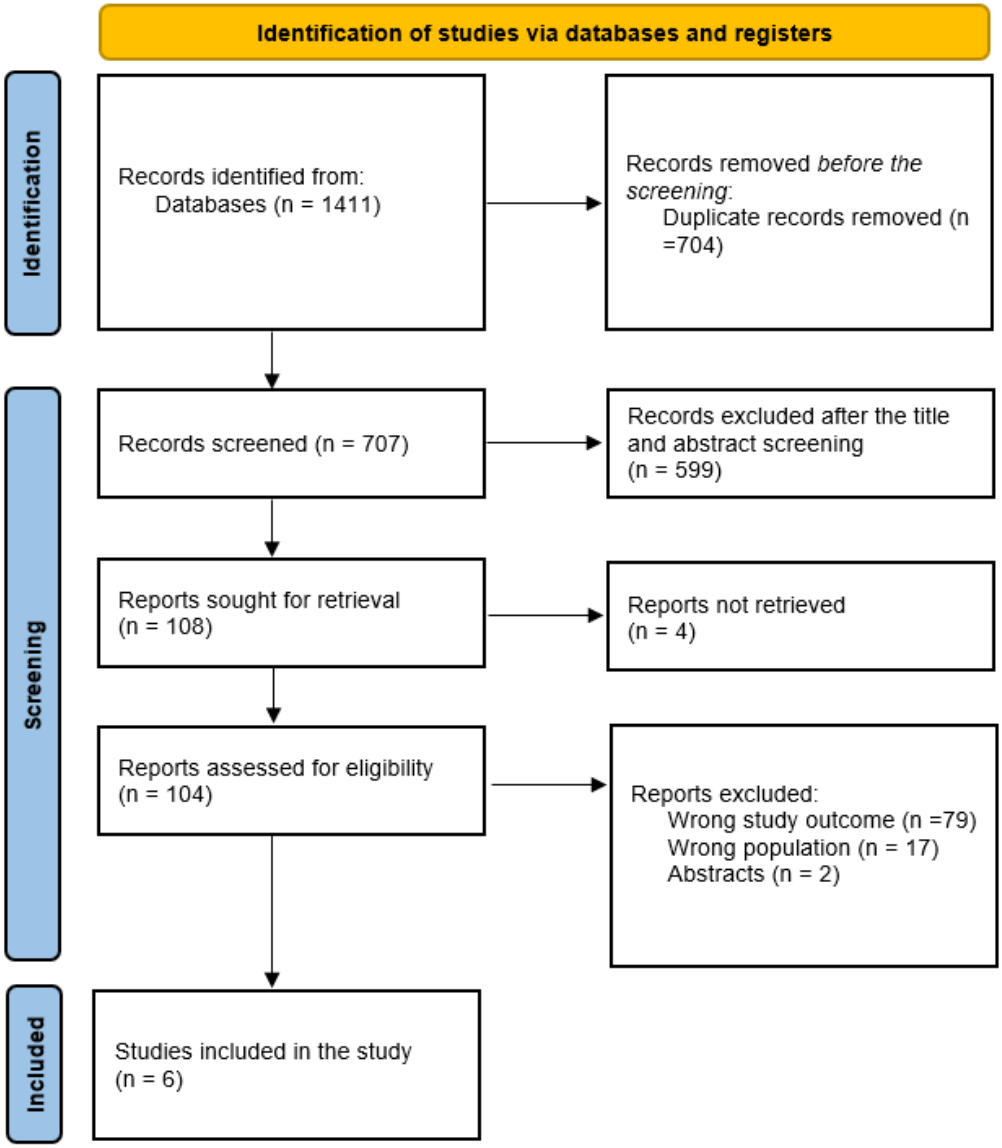

Figure 1.
PRISMA flowchart.
Source: O'Dea, et al. [12].

3.1. Sociodemographic and Clinical Outcomes

We included six studies with a total of 2612 drug addicts and the majority, 2051 (78.5%), were males. Regarding study designs, four articles were cross-sectional studies [13-16] and two were case-control [17, 18]. One study was implemented in the USA [13], one in Iran [14], one in Australia [15], one in China [16], one in Egypt [17], and one in India [18].

The findings across the studies consistently highlight the significant presence of anxiety and depression among individuals with drug addiction, demonstrating the extensive impact of these mental health disorders within this population. Research indicates a direct correlation between the severity of substance use and the severity of anxiety and depression symptoms, especially noted in environments where individuals are repeatedly exposed to substance use, such as among farmworkers [13].

Additionally, the studies reveal that different substances may have varying impacts on mental health. For instance, cannabis users exhibit a higher incidence of anxiety and depression compared to the general population, suggesting specific risks associated with cannabis use [14]. Moreover, the severity of these mental health conditions is not only influenced by the type of substance used but also by demographic and socio-economic factors that compound the challenges faced by these individuals [15].

Table 1.
Outcome measures of the included studies.

Study ID	Study design	Country	Sociodemographic	Depression diagnostic tool	Anxiety diagnostic tool	Anxiety (%)	Depression (%)	Main outcomes
Keeney, et al. [13]	Cross-sectional	USA	N= 56 Mean age: 52.5 Males: 37.5%	GAD-7	PHQ-9	NM	NM	Farmworkers who were exposed to substance use at work showed a significant correlation with more severe anxiety symptoms (p = .018). Additionally, as the level of exposure to substance use increased, farmworkers experienced heightened severity of both depression (p = .007) and anxiety symptoms (p = .001).
Vaziri-Harami, et al. [14]	Cross-sectional	Iran	N= 100 Mean age: 24.1 Males: 68%	BAI	BDI	60 (60%)	33 (33%)	The study indicates a higher incidence of anxiety and depression disorders among cannabis users compared to the general population, suggesting a probable association between cannabis use and these mental health conditions.
Duncan, et al. [15]	Cross-sectional	Australia	N= 725 Mean age: 34.1 Males: 61.2%	GAD-7	PHQ-9	334 (46%)	370 (51%)	The elevated occurrences of anxiety and/or depression were linked to various factors, including demographic, socio-economic, substance use, and other health and social influences.
Luo, et al. [16]	Cross-sectional	China	N= 1486 Mean age: 38.9 Males: 86.3%	SAS	SDS	859 (57.8%)	1029 (69.2%)	Participants using methamphetamine exhibited a higher prevalence of severe depression compared to those using heroin or multiple substances. Anxiety consistently emerged as a risk factor for severe depression in drug users.
Mohamed, et al. [17]	Case-control	Egypt	N= 100 Mean age: 28.1 Males: 100%	HAM-A	HRS-D	85 (85%)	93 (93%)	Substance use disorders are linked to high levels of anxiety and depression, particularly severe forms of these mental health conditions. There is a clear relationship between the presence of anxiety and depression and the severity of drug-related issues.
Chauhan, et al. [18]	Case-control	India	N= 145 Age range: 20-40 Males: 93.1%	HAM-A	HRS-D	28 (19.4%)	18 (12.5%)	Individuals with substance use disorders are more prone to suffer from severe levels of anxiety and depression. The severity of these co-occurring mental health disorders is significantly linked to the intensity of substance use.

Table 2.
Risk of bias assessment using ROBINS-I.

Study ID	Bias due to confounding	Bias in the selection of participants into	Bias in the classification of interventions	Bias due to deviations from the intended interval	Bias due to missing data	Bias in the measurement of outcomes	Bias in the selection of reported results	Overall bias
Keeney, et al. [13]	Low	Low	Low	Low	Low	Low	Mod	Low
Vaziri-Harami, et al. [14]	Mod	Mod	Low	Low	Low	Low	Low	Low
Duncan, et al. [15]	Low	Low	Low	Low	Low	Low	Mod	Low
Luo, et al. [16]	Mod	Low	Low	Low	Low	Mod	Mod	Moderate
Mohamed, et al. [17]	Mod	Mod	Low	Low	Low	Mod	Low	Moderate
Chauhan, et al. [18]	Mod	Mod	Low	Low	Low	Mod	Mod	Moderate

A significant portion of the population studied shows severe levels of depression and anxiety, with these conditions often occurring alongside high levels of substance use. This relationship underscores the complexity of treating substance use disorders when they are co-occurring with mental health disorders such as anxiety and depression. The findings suggest that treatment for substance use must also robustly address mental health issues to reduce the burden of disease and improve the overall quality of life for affected individuals [16, 17].

These insights collectively emphasize the intertwined nature of substance use and mental health disorders, highlighting the need for integrated treatment approaches that are sensitive to the complexities of these co-occurring conditions [18].

4. Discussion

The systematic review of the literature emphasizes a pronounced correlation between substance use and the increased prevalence of anxiety and depression among individuals with substance use disorders. This relationship suggests that not only does substance use potentially exacerbate existing mental health issues, but mental health disorders may also drive individuals toward substance use as a form of self-medication. The compounding effects of these disorders create a cyclical vulnerability, where each condition potentially worsens the other.

Environmental factors, such as exposure to substance use in the workplace, are shown to significantly influence the severity of anxiety and depression, indicating that context and environment are crucial elements in the prevalence and intensity of these disorders. Socioeconomic factors also play a substantial role, as they often dictate the accessibility of resources, the quality of treatment available, and overall patient outcomes. These findings highlight the importance of a holistic approach to treatment that considers the myriad of external factors influencing recovery.

Keller et al. [19] reported significant insights into the incidence, formation and persistence patterns, clinical effect, and therapeutic considerations for these interconnected psychiatric issues have been gained from the present body of research and clinical attention on comorbid anxiety and drug use disorders [19].

The therapeutic impact of co-occurring anxiety and drug use disorder pairs highlights the significance of high comorbidity rates, developmental patterns, and mutual maintenance. It is not surprising that both drug use disorders and anxiety disorders affect the course and treatment effectiveness for the counterpart illness, given the mutual maintenance pattern of this comorbidity. Anxiety disorders, for instance, have been linked in studies to higher lifetime alcohol use disorder severity, higher lifetime service utilization among substance use disorder individuals, greater alcohol withdrawal severity, and higher relapse rates after substance abuse treatment [20, 21].

In the same line of our results, Chmiel, et al. [22]. reported that depression is significant across measures of substance use and impairment, such as evaluations of alcohol, cocaine, and overall drug use [22]. Targeting depression during commonplace substance abuse treatment may not be an effective way to improve substance-related outcomes because depression only weakly correlates with indicators of substance use and impairment and does not seem to predict a worse outcome from substance abuse treatment. Additionally, depressed cocaine users may not need enhanced interventions that target substance use and depression per se, though additional interventions that target depression in these clients may be helpful in many situations [22].

The strong association between drug addiction and mental health issues has significant clinical implications. It necessitates a paradigm shift in the treatment of substance use disorders, advocating for an integrated treatment model that encompasses mental health care as a fundamental element. Such an approach would involve dual diagnosis capabilities in all substance use disorder treatment facilities, ensuring that treatment plans address both the addiction and any co-occurring mental health disorders simultaneously.

Furthermore, the data support the need for ongoing training for healthcare providers that focus on both the identification and management of co-occurring disorders. Enhanced screening procedures that can identify mental health issues early in the treatment process are essential, as they allow for timely interventions that can significantly improve recovery outcomes.

6. Strengths

The studies within the review benefit from diverse demographic samples and a variety of geographic settings, which bolsters the external validity of the findings. The use of established, validated diagnostic tools across the research enhances the reliability of the data regarding the prevalence and severity of anxiety and depression in individuals with substance use disorders.

7. Limitations

Despite these strengths, the studies' cross-sectional nature remains a notable limitation, as it hinders the ability to determine causality between substance use and mental health disorders. The absence of longitudinal data limits understanding of the long-term effects of substance use on mental health and vice versa. Additionally, most studies focus on specific types of substances, which may not fully represent the broader spectrum of substance use and its varied impacts on mental health.

8. Conclusion

This review emphasizes the critical need for integrated approaches in the treatment of substance use disorders and associated mental health issues. Future research should aim to incorporate longitudinal designs to better understand the causative dynamics over time and to assess the long-term efficacy of integrated treatment approaches. Emphasizing comprehensive care that addresses both substance use and mental health simultaneously will not only improve treatment

outcomes but also enhance the overall well-being and quality of life for affected individuals. Such efforts are essential to advance the field of addiction medicine and public health.

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