IOSR Journal of Humanities and Social Science (IOSR-JHSS)
Volume 31, Issue 6, Series 5 (June, 2026) 15-24
e-ISSN: 2279-0837, p-ISSN: 2279-0845.
www.iosrjournals.org

Beyond Abstinence: The Influence of Dark Triad Personality Traits on Cognitive and Psychosocial Rehabilitation Outcomes in Substance Use Disorders

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Abstract
Background: *Substance Use Disorders (SUDs) are linked with significant cognitive, behavioral and psychosocial impairments, such as deficits in executive functioning, attention, working memory and decision making. These impairments negatively impact treatment adherence and relapse prevention. Emerging evidence also indicates that maladaptive personality characteristics, particularly Dark Triad traits (Machiavellianism, narcissism and psychopathy), may contribute to substance use behaviors, poor self-regulation, resistance to treatment and vulnerability to relapse. Despite their clinical relevance, these personality traits have not been extensively discussed in rehabilitation models. Psychosocial rehabilitation remains the cornerstone of treatment in many de-addiction settings, often without systematically considering the impact of cognitive deficits and personality-related risk factors.*
Objective: *This review aims to evaluate the role of Dark Triad personality traits in substance use disorders and the efficacy of combined cognitive and psychosocial rehabilitation approaches to improve recovery outcomes.*
Methods: *A systematic review in accordance with PRISMA guidelines was performed. Peer-reviewed studies published between 2015 and 2025 were identified by online databases. Studies were included if they involved participants with substance use disorders and focused on cognitive rehabilitation, psychosocial rehabilitation, Dark Triad personality traits or treatment outcomes. The results were analyzed to assess the association between personality characteristics, rehabilitation processes and recovery outcomes.*
Results: *The reviewed literature indicates that combined cognitive and psychosocial rehabilitation approaches result in enhancements in executive functioning, working memory, cognitive flexibility, treatment engagement and decision-making abilities. Moreover, findings indicate that Dark Triad personality traits correlate with higher impulsivity, risk-taking behaviors, interpersonal difficulties, poorer treatment adherence and increased relapse risk. Individuals scoring higher on psychopathy, narcissism and Machiavellianism may face additional obstacles to effective rehabilitation. These findings emphasize the importance of incorporating personality-related variables along with cognitive and psychosocial interventions in the development of comprehensive treatment plans. However, there is a lack of empirical studies that investigate these variables collectively, especially in the Indian context.*
Conclusion: *The recovery from substance use disorders is influenced by a complex interplay of cognitive, psychosocial, and personality-related variables. The integration of cognitive rehabilitation and psychosocial interventions, while considering Dark Triad personality traits, may improve treatment effectiveness and foster sustained recovery. Future research should focus on culturally relevant and standardized rehabilitation frameworks that incorporate personality assessment and long-term outcome evaluation.*
Keywords: *Substance Use Disorders, Dark Triad, Machiavellianism, Narcissism, Psychopathy, Cognitive Rehabilitation, Psychosocial Rehabilitation, Addiction Recovery.*

Date of Submission: 13-06-2026 Date of Acceptance: 25-06-2026

I. Introduction

Substance use disorders (SUDs) are a major public health problem worldwide, with significant psychological, social, vocational and medical sequelae. Current theories of addiction describe drug use disorders as multidimensional diseases with neurobiological, cognitive, psychosocial, and psychological components, and not just a type of maladaptive behavior or physiological dependency (Goldstein & Volkow, 2011). Addiction is a chronic, relapsing disease, and successful recovery is more than abstinence. This requires an understanding of the cognitive, emotional and interpersonal processes which determine engagement in therapy and longer term change in behaviour.

Drug use disorders (Goldstein & Volkow, 2011; Rass et al., 2015) are often linked to impairments in executive functioning, working memory, attention, inhibitory control and decision-making. Such impairments

limit an individual's capacity to regulate behavior, recognize consequences, inhibit impulses, and employ coping strategies during recovery. Neurocognitive deficits are also associated with poor adherence to treatment, less involvement in rehabilitation programs and an increased risk of relapse (Wanmaker et al., 2017). Addiction is therefore increasingly conceptualized as a disease of self-regulatory failure involving dysregulation of brain systems supporting reward processing and executive function.

While the addiction research literature has paid considerable attention to cognitive dysfunction, there is emerging evidence to suggest that personality factors may play a pivotal role in the development, maintenance and recurrence of drug use behaviours. Personality traits influence how we perceive stress, regulate emotions, respond to environmental stressors and therapy. The Dark Triad is a personality framework that is receiving increasing empirical attention. The Dark Triad includes Machiavellianism, narcissism and psychopathy (Paulhus & Williams, 2002). Although the two constructs are distinct, they share characteristics such as emotional detachment, manipulation of others, egocentricity, low empathy, and a tendency to exploit others (Jones & Paulhus, 2014).

Dark Triad traits have been linked to a range of maladaptive outcomes including aggression, risk-taking, antisocial behavior, crime and health-risk behaviors (Jonason et al., 2015; Muris et al., 2017). These are especially important for the study of drug use disorders because many of the psychological mechanisms involved in addiction are similar to those associated with the Dark Triad traits. For instance, psychopathy is frequently linked to impulsivity, sensation seeking, decreased behavioral inhibition, and a preference for immediate reward, all of which are well-established risk factors for drug addiction (Miller et al., 2019). In the same vein, narcissism has been associated with emotional fragility, maladaptive coping and self-enhancement goals, all of which may contribute to problematic drug use (Buelow & Brunell, 2014). Machiavellianism is the strategic manipulation and exploitation of others and may influence treatment involvement and the therapeutic relationship and subsequently rehabilitation outcomes (Muris et al., 2017).

The implications of Dark Triad features extend beyond the initiation of drug use and may have important implications for recovery efforts. The success of rehabilitation depends on the motivation for change, emotional awareness and self-regulation, compliance with therapy and ability to develop strong interpersonal interactions. Higher scores of psychopathy, narcissism or Machiavellianism may be associated with deficits in one or more of these domains which may in turn increase susceptibility to treatment dropout and relapse (Jonason et al., 2015). Despite these potential consequences, neurocognitive and psychosocial factors are much better studied in rehabilitation research than personality-based risk variables.

The treatment of drug use disorders continues to be based primarily on psychosocial rehabilitation. Cognitive-behavioral therapy (CBT), motivational enhancement therapy (MET), techniques for relapse prevention, group therapy, and community-based recovery programs are effective therapies to promote abstinence and psychosocial functioning (Kiluk et al., 2018). However, such treatments generally assume that patients have the cognitive ability to understand, remember and use therapeutic information. Cognitive deficits and maladaptive personality traits may limit the individual's ability to fully benefit from these techniques and thereby limit the success of therapy.

It has been developed as a potential adjunct technique to overcome these limitations. Cognitive rehabilitation is aimed at improving attention, memory, executive functioning, problem solving and self-regulation through systematic training and compensatory methods (Brooks et al., 2017). Research has found that enhancement of cognitive functioning can improve outcomes in treatment engagement, learning, decision making and relapse prevention (Rass et al., 2015). However, there is still a lack of research on the combined effect of cognitive functioning, psychosocial rehabilitation and personality factors.

Indian scene is much more complex. Most of the de-addiction therapies are based on the paradigms of psychosocial rehabilitation Systematic cognitive assessment and personality-informed intervention planning are quite rare (Rajeswaran & Bennett, 2018). Further, there are few empirical studies on the impact of Dark Triad personality characteristics on Indian substance-using communities. The influence of cultural values, family structures, societal stigma and treatment accessibility on the recovery outcomes should be taken into consideration in culturally relevant rehabilitation frameworks.

Current data thus support an interaction of neurocognitive performance, psychosocial variables and personality features in recovery from drug use disorders . However, these areas have been mostly investigated in isolation, which has resulted in a fragmented view of rehabilitation outcomes. The data of the cognitive rehabilitation, psychosocial rehabilitation and Dark Triad personality studies in combination may contribute to a more complete knowledge of recovery processes and to the development of tailored treatment approaches. Therefore, the main purpose of this systematic review is to analyze the effect of dark triad personality traits on the rehabilitation outcome in patients with drug use disorder. Therefore, the role of cognitive and psychosocial rehabilitation in facilitating recovery in the long term is discussed.

The Dark Triad Personality Traits and Substance Use Disorders

The Dark Triad is a hypothesis in psychology, which consists of three socially undesirable personality qualities, Machiavellianism, narcissism and psychopathy (Paulhus & Williams, 2002). However, the way these attributes are expressed in behavior is diverse, but they have common elements such as interpersonal manipulation, emotional detachment, self-centeredness, lower levels of empathy and exploitative tendencies (Jones & Paulhus, 2014). Over the last two decades, there has been an increasing academic interest in the significance of Dark Triad characteristics in explaining maladaptive behaviors, such as aggression, criminality, hazardous decision making, and drug use (Jonason et al., 2015; Muris et al., 2017).

Substance use disorders are the outcome of a complex combination of biological, psychological, social and personality elements. Personality characteristics are crucial for regulating emotion, for coping techniques, for connections with others, and for choosing behaviors. Thus the Dark Triad has developed as a potentially useful model for explaining individual variations in vulnerability to drug use, treatment engagement, and effectiveness of recovery.

Psychopathy and Substance Use Disorder

Psychopathy, one of the three Dark Triad qualities, has the greatest and most consistent connection with drug use behaviors (Miller et al., 2019). Psychopathy is associated with impulsivity, sensory seeking, shallow emotion, reduced empathy, guiltlessness and poor behavioral control (Paulhus & Williams, 2002). These characteristics are strongly associated with several psychological aspects of addiction that include decreased self-control and heightened reward sensitivity.

High psychopathic traits are associated with a preference of short-term gains over long-term rewards and so individuals with such traits are more likely to attempt drugs and continue usage despite unfavorable effects (Jones & Paulhus, 2014). Psychopathic features have also been associated with greater impulsivity, risk-taking behaviour, treatment non-adherence and vulnerability to relapse (Miller et al., 2019). Such attributes might hinder a person's capacity to successfully engage in organized rehabilitation programs requiring ongoing monitoring of behavior and a long-term commitment to recovery.

Narcissism and Substance Use Disorder

Narcissism is described as grandiosity, entitlement, self-enhancement, and a high desire for praise (Paulhus & Williams, 2002). Those high in narcissism may exude confidence and self-assurance, however research reveals that narcissistic functioning may be linked to underlying vulnerabilities related to self-esteem control and emotional instability (Miller et al., 2017).

Substance use can serve a number of psychological roles for narcissists, including increasing self-confidence, down-regulating negative affect, preserving self-image, and avoiding feelings of inadequacy (Buelow & Brunell, 2014). Furthermore, narcissists may be more emotionally upset to criticism, rejection or failure and so more sensitive to maladaptive coping behaviors such as drug use (Hart et al., 2017).

Narcissistic traits may be relevant to motivation, treatment perseverance, and response to therapeutic feedback in the therapeutic situation. In the face of challenge to the self-concept by therapy, defensiveness, resistance, or unpreparedness to accept responsibility for the substance-related problems may interfere with successful recovery.

Machiavellianism and Substance Use Disorder

Machiavellianism is a psychological trait that is characterised by the purposeful manipulation and exploitation of others, cynicism and a focus on self-interest (Christie & Geis, 1970). Machiavellianism, as opposed with psychopathy and narcissism, has been very infrequently studied in addictions. However, there is rising evidence that highly Machiavellian persons may turn to drugs when such behaviors provide instrumental value in acquiring social acceptance, status, or interpersonal advantages (Jonason et al., 2015).

Interpersonal qualities linked to Machiavellianism may also play a role in success in recovery. Distrust, unwillingness to reveal personal concerns and manipulative relational styles may hinder a strong therapy connection. These interpersonal problems might affect treatment participation and recovery results in significant ways, since successful rehabilitation often depends on collaborative relationships between clients and treatment providers (Muris et al., 2017).

Dark Triad Traits as Obstacles to Recovery

The Dark Triad personalities influence the development and maintenance of drug addiction and the rehabilitation process. Successful rehabilitation needs emotional awareness, impulsive control, determination to change, treatment commitment and ability to develop supportive inter-personal connections. Individuals who score high on psychopathy, narcissism, or Machiavellianism may lack one or more of these traits (Jonason et al., 2015).

Psychopathic features can explain increased impulsivity and less self-regulation. Narcissistic vulnerabilities may limit involvement in therapy and the acceptance of therapeutic input. Machiavellian qualities are detrimental to trust and engagement in the therapeutic partnership. All these characteristics together may lead to poor treatment adherence, low retention rates and higher risk for relapse (Muris et al., 2017; Miller et al., 2019).

The increasing research about the link between Dark Triad qualities and drug use and recovery outcomes, points to the need of addressing personality aspects, in addition to neurocognitive and psychosocial elements in the development of comprehensive models of rehabilitation. Understanding how these attributes may affect treatment engagement and the recovery process may allow for more personalized interventions and better long-term outcomes for people with drug use disorders. While there is an increasing body of research showing the relevance of cognitive functioning in addiction recovery, the literature on the impact of personality factors in rehabilitation success is somewhat limited. In particular, the Dark Triad personality traits have been linked to impulsivity, maladaptive coping, interpersonal problems, and risk-taking behaviors that may influence treatment involvement and recovery .However, until far research has mostly focused on cognitive deficiencies, psychosocial rehabilitation and Dark Triad features as discrete domains, leading to a partial knowledge of drug use recovery.While there is an increasing body of research showing the relevance of cognitive functioning in addiction recovery, the literature on the impact of personality factors in rehabilitation success is rather scarce. In particular, the Dark Triad personality characteristics have been linked to impulsivity, maladaptive coping, interpersonal problems, and risk-taking behaviors that might impact treatment involvement and recovery. However, until far research has mostly focused on cognitive deficiencies, psychosocial rehabilitation and Dark Triad features as discrete domains, leading to a partial knowledge of drug use recovery.

This mismatch is especially evident in the Indian setting where rehabilitation services are still mostly reliant on psychosocial treatments and little emphasis is made on personality-informed intervention planning. In addition, there are very few empirical investigations on the combined role of cognitive functioning, psychosocial rehabilitation and Dark Triad personality features in a population with drug use disorders .

The present systematic study therefore intends to evaluate the association between Dark Triad personality characteristics and drug use disorders and to assess the effect of cognitive and psychosocial rehabilitation in recovery outcomes. This study aims to give a complete knowledge of factors impacting treatment engagement, relapse vulnerability and long term recovery through synthesis of data from personality, neuropsychological, and rehabilitation research.

II. Methodology

Study Design

The goal of the present study was to systematically analyze empirical information about the link between Dark Triad personality characteristics and drug use disorders, and to explore the effect of cognitive and psychosocial rehabilitation interventions on recovery results. This review was performed according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) standards to guarantee methodological rigor, transparency, and reproducibility. We systematically identified, screened, appraised and synthesized relevant research on personality traits, cognitive functioning, rehabilitation strategies and treatment results in people with drug use disorders.

Search strategies

We performed an extensive literature search using electronic databases including PubMed, Scopus, PsycINFO, and Web of Science. The search includes peer-reviewed literature published from January 2015 to March 2025 to cover contemporary breakthroughs in addiction rehabilitation, personality studies, and cognitive intervention techniques.

“Search terms were formulated using relevant keywords and Boolean operators. The main search strategy included combinations of the following terms: “substance use disorder”, “addiction”, “Dark Triad”, “psychopathy”, “narcissism”, “Machiavellianism”, “cognitive rehabilitation”, “cognitive remediation”, “cognitive training”, “psychosocial rehabilitation”, “executive functioning”, “relapse prevention” and “treatment outcomes”. In addition, the reference lists of chosen research and pertinent review articles were hand-searched for additional qualifying publications.

Eligibility Criteria

Studies were included on the basis of pre-specified inclusion and exclusion criteria to ensure consistency and relevance to the objectives of the review.

Inclusion Criteria

Studies were included when the following criteria were met:

1. Participants were individuals with Substance Use Disorders (SUDs) including alcohol, opioid, stimulant, cannabis or polysubstance use disorders as defined by standardized diagnostic criteria such as the *Diagnostic and Statistical Manual of Mental Disorders* (DSM) or the *International Classification of Diseases* (ICD).
2. Studies investigated one or more of the following variables:
Dark triad personality traits (Machiavellianism, narcissism and psychopathy); Cognitive functioning, cognitive rehabilitation, cognitive remediation or cognitive training;
Psychosocial rehabilitation interventions such as Cognitive Behaviour Therapy (CBT), Motivational Enhancement Therapy (MET), relapse prevention, group therapy or community-based rehabilitation.
3. Studies reported measurable outcomes on cognitive functioning, treatment engagement, treatment adherence, relapse, severity of substance use, rehabilitation outcomes or psychological functioning.
4. Empirical studies using quantitative methods such as randomized controlled trials, quasi-experimental studies, cohort studies, longitudinal studies, cross-sectional studies, and observational study designs.
5. Articles published in peer reviewed journals from January 2015 to March 2025.
6. Publications in the English language.

Exclusion Criteria
Studies were excluded if they satisfied any of the following criteria:
1. Participants did not present with a primary diagnosis of a Substance Use Disorder.
2. Studies only of behavioral addictions (e.g., gambling disorder, internet gaming disorder or social media addiction) without substance-related addictions.
3. Studies not evaluating the Dark Triad traits, cognitive functioning, rehabilitation interventions and/or treatment-related outcomes.
4. Qualitative studies, case reports, conference abstracts, dissertations, editorials, commentaries, book reviews and non-peer reviewed publications.
5. Studies lacking methodological information or with poor outcome reporting.
6. Duplicate publications or studies that report on the same datasets.

Treatment Outcomes

Cognitive Outcomes:

Across the various reviewed studies, cognitive rehabilitation and other supportive cognitive treatment provide mixed yet useful results in people that faces substance use disorder. A common finding is that these treatments generally focus on improving executive function, working memory, impulse control, and attention among the individuals(Nardo et al., 2021; Rajeswaran & Bennett, 2018).

Multiple studies on working memory training found improvement in the executive skills that were being practiced. For example, Rass et al. Patients on methadone treatment showed better backward digit span and visuospatial working memory (2015). Brooks et al. (2017) also showed improvements in working memory and impulse control in methamphetamine users who had received additional training. Stanger et al. (2020) reported improved visuospatial working memory in young people with cannabis use disorder, although these improvements did not always translate to wider cognitive or behavioural changes.

However, some randomized controlled trials indicated that these benefits do not always extend to other areas. Wanmaker et al. (2017) found no significant improvement in untidy areas such as impulsivity, attention bias, or overall executive functioning after working on memory training. This supports the broader conclusion by Nardo et al. (2021) that any cognitive remediation programs help with specific tasks and that this is maintained to individuals, but there is weaker evidence that they help to improve daily real-life functioning.

Cognitive bias modification during withdrawal also shows some promise in shifting unhealthy patterns of thinking associated with craving and relapse (Wiers et al., 2018). However, these effects tend to be small and context-dependent, especially when the intervention is not combined with broader psychosocial support. Moreover, combined approaches that employ both mindfulness-based and cognitive techniques seem to enhance attention control, self-awareness, and emotional regulation (Praveen, 2025). This suggests that simple training alone may not be sufficient, and that multi-component intervention may be better suited to address the emotional challenge of addiction along with complex mental health issues.

Generally, the research indicates that cognitive rehabilitation can improve some mental skills, especially working memory and executive control, but its effects on everyday functioning are not yet completely consistent. Clinical Outcomes (Relapse, Retention, and Substance Use): Regarding clinical outcome, research shows mixed, but somewhat encouraging results. Most of the studies suggest that cognitive rehabilitation works best as a supportive treatment, but not the only singular treatment on its own.

Some studies suggest that better cognitive functioning may indirectly help the patient to stay involved in the treatment and reduce further substance use. For example, Rass et al. (2015) found that people receiving methadone treatment used drugs less often after working memory training. Brooks et al. (2017) also found better

self-control, which was associated with lower substance-related behaviors. Cognitive-behavioral treatments, especially when delivered in a more structured or digital format, have also been associated with better treatment participation and lower substance use (Kiluk et al., 2018; IJPsy, 2018).

CBT-based support in alcohol dependency also gave similar results. Some studies found a relatively lower relapse rate after six months and one year when compared to usual treatment alone (Kumar et al., 2018). Mindfulness-based approaches, in combination with cognitive techniques, also report lower cravings, better ability to cope with distress, and stronger self-confidence in recovery (Praveen, 2025).

At the same time, some strong studies found little or no clear effect on main clinical outcomes. For example, Stanger et al. (2020) found no significant differences in abstinence or cannabis use outcomes with the addition of working memory training to contingency management. Wanmaker et al. (2017) found no significant differences in relapse-related factors, craving or mental health symptoms between the active training and placebo groups. This inconsistency is also discussed in systematic reviews. Nardo et al. (2021) conclude that this cognitive remediation looks promising, but evidence is not strong enough to provide detailed information about solid clinical benefit. This is partially due to the fact that this study used different types of interventions along with different patient groups that have their own outcome measures.

Resource constraints and feasibility

Due to limited resources, the cognitive rehabilitation is difficult to execute in India. Some of the main problems are not having sufficient amount of trained professionals, lack of time and weak infrastructure for many patients (Rajeswaran & Bennett, 2018; Ambekar et al., 2021).

It is also difficult for the patient to stay involved in a structured treatment program. For example, Stanger et al. (2020)found low participation completion rate of the patient even in the controlled settings. In a similar way, Kiluk et al. (2018) pointed out that keeping people engaged in the treatment that is computerized is difficult and challenging.

A simpler and more flexible approach may work even better when compared to above. Short cognitive exercises or adding these methods into the existing therapy on the client can make the treatment easier to use in practice.

Cultural considerations

Cultural factors play a crucial role in the Indian context. Differences in literacy, language, family systems, stigma, and beliefs about addiction influence treatment engagement and outcomes (Ambekar et al., 2021). Interventions that require abstract reasoning or extensive self-practice may not be suitable for all populations. Even mindfulness-based approaches, though culturally appropriate in some settings, require careful adaptation and interpretation (Praveen, 2025). Adaptation of cognitive rehabilitation Rather than completely new systems, evidence points to the importance of integration and adaptation. Cognitive rehabilitation can be incorporated into existing treatment using: • simplified cognitive exercises • compensatory strategies • repetition-based learning • structured relapse prevention Neuropsychological assessment can guide tailored treatment planning (Rajeswaran & Bennett, 2018). Additionally, integrating cognitive components into CBT and relapse prevention models may enhance effectiveness.

Comparison with 12-Step and Traditional Rehabilitation Models

Traditional rehabilitation approaches, including 12-step program and many abstinence-based treatments, generally focus on surrender, motivation, behaviour change, peer support, and daily routine. These approaches help to provide emotional support and give strong social support, but may not directly help to improve cognitive problems like poor impulse control, weak working memory, or low mental flexibility. On contrary, a cognitive rehabilitation is designed to strengthen the mental skills that is needed for self-monitoring, planning, and using coping strategies.

This does not mean that one approach is better than another, in the sense that they can support one another. Cognitive behavioural treatment helps patients to identify triggers, challenge their unhealthy thinking patterns, and learn better coping skills, while, on the other hand, cognitive rehabilitation can help to improve mental abilities that are needed to use those skills well (Kiluk et al., 2018). In the similar way, 12-step or community-based rehabilitation can help to provide structure and a sense of belonging. Along with that, cognitive intervention helps to focus on improving readiness for change and self-control.

Strengths and limitations

The strength of traditional rehabilitation models lies in accessibility, peer support, identity change, and continued community engagement. Their limitation is that they may assume intact learning, memory, and self-regulation capacities. The strength of cognitive rehabilitation lies in its focus on impaired executive functions and decision-making, but its limitation is that it can be resource-intensive and has not yet shown consistently strong real-world effects across studies.

Role of cognitive readiness

A key concept linking these models is cognitive readiness. Patients with severe cognitive impairment may struggle to benefit fully from standard counseling, relapse prevention, or 12-step learning. This implies that assessing cognition early may help clinicians decide whether a patient first needs simplified materials, repetition, compensatory strategies, or adjunctive cognitive exercises before expecting full benefit from traditional rehabilitation.

Limited Indian research:

Despite the relevance of cognitive deficits in addiction, Indian empirical research remains limited. The bulk of the current literature is conceptual or descriptive rather than experimental (Rajeswaran & Bennett, 2018). This highlights the importance of evidence in context. Overall, the study gave information that cognitive rehabilitation is useful but still a developing part of treatment for substance use disorder across many studies that it discussed here. Now, problems in working memory, attention, self-control, and executive function are constantly seen as important as they can make it harder for people to stay engaged in treatment and help the patient to learn recovery skills and therefore avoid relapse.

Research on cognitive remediation and working memory training suggests that these treatments can improve certain mental skills, especially the ones directly practiced during training. An important consideration in the literature is that cognitive rehabilitation appears to be most effective when integrated with established psychosocial treatments rather than used as a stand-alone intervention (Nardo et al., 2021; Kiluk et al., 2018). A more comprehensive approach that incorporates cognitive, behavioral, and emotional regulation techniques may be more efficacious because it more fully addresses the complex nature of substance use disorders (Praveen, 2025).

In India, direct research evidence is limited, but the existing study suggests that the cognitive problems are still relevant in addiction treatment, and the neuropsychological assessment and rehabilitation should be included while planning the treatment. During the same time, practical barriers like shortage of trained professionals, limited resources, and differences in training settings mean that these approaches need to be adapted in a way that tells culturally appropriate and realistic to attain.

The findings suggest that the future progress will be dependent on creating interventions that are practical, culturally adapted, and standardized, and with the backing of long-term studies. Instead of replacing traditional rehabilitation methods, cognitive rehabilitation should be viewed as a supportive part of a broader, integrated approach to addiction treatment.

Study Selection

Study selection was performed using PRISMA standards. All records found through the database search were transferred to a reference management system and duplicates were deleted prior to screening.

The screening technique was carried out in two steps. In the first stage, relevance of the titles and abstracts to the study goals was assessed. At this point, articles that were plainly not meeting the inclusion criteria were eliminated. The complete texts of possibly eligible studies were obtained at the second step and examined in depth to determine if they met the stated inclusion and exclusion criteria.

Studies that satisfied all of the qualifying criteria were subject to final evaluation. Reasons for elimination at the full-text stage were recorded to guarantee openness and repeatability of the selection process. A PRISMA flow diagram detailed the whole screening and selection process .

Quality of the Studies

The methodological quality of the included studies was assessed for the reliability and validity of the findings. Particular emphasis was paid to research design, sample characteristics, measuring methods, intervention procedures, reporting of outcomes, and statistical analysis.

III. Results and Conclusion

Dark Triad Personality Traits and Substance Use Disorders

The literature review revealed that Dark Triad personality characteristics are consistently related to substance use behaviors and may be important psychological risk factors for the development and maintenance of substance use disorders. The magnitude of these associations is not consistent across studies (Muris et al., 2017; Jonason et al., 2015). However, psychopathy, narcissism and Machiavellianism have been associated with traits that are more prone to substance misuse such as impulsivity, sensation seeking, emotional dysregulation, interpersonal difficulties and maladaptive coping strategies.

Psychopathy was the most consistently and strongly associated characteristic with substance use outcomes. These findings, taken together, highlight the significance of personality assessments when planning for addiction treatment. Awareness of individual differences in Dark Triad traits could help clinicians tailor

interventions aimed at personality-related vulnerabilities, substance use symptoms, and potential barriers to recovery. Empirical research to date indicates a broad relationship between Dark Triad traits and substance use disorders, but there is a gap in research regarding rehabilitation outcomes. This is an important area for future research, especially in treatment settings and among diverse populations.

Substance Use Disorder along with Dark Triad Traits

The literature review shows a consistent association between the Dark Triad personality traits and substance use behaviors and the potential significance of these traits as psychological risk factors for the development and persistence of substance use disorders. Traits that increase the risk of substance use have been related to psychopathy, narcissism and Machiavellianism, such as impulsivity, sensation seeking, emotional dysregulation, interpersonal problems and maladaptive coping strategies (Jonason et al.,., 2015; Muris et al.,., 2017). However, the strength of the association with substance use varies between studies. Among the three traits, psychopathic behavior was the only consistent and significant predictor of substance use outcomes. Psychopathic traits are associated with increased impulsivity, decreased inhibition, and increased sensitivity to rewards, which increase the likelihood of trying drugs and continuing to use drugs despite adverse outcomes (Miller et al., 2019). These findings are consistent with neurobehavioral models of addiction that emphasize impaired self-regulation and decision-making as central mechanisms of substance dependence. We also found relations between narcissistic traits and problematic substance use . However, it looks like this relationship is mediated by self-esteem regulation and emotion control processes. Research has found that individuals who score high on narcissism may use drugs to maintain a desired self-image, to reduce emotional distress, or to boost confidence (Buelow & Brunell, 2014; Hart et al., 2017). Moreover, sensitivity to criticism and interpersonal rejection may place individuals at risk for maladaptive coping behaviors, such as substance use. There is little evidence for a relationship between Machiavellianism and substance use, however, some evidence exists that people high in Machiavellian traits may use substances in social situations for personal gain, social approval or status (Jonason et al., 2015). Machiavellianism is a distrustful and manipulative interpersonal attitude. Patient involvement in treatment and success in rehabilitation may be affected, posing difficulties for the therapeutic setting.

In conclusion, our findings suggest a role of Dark Triad traits in initiating and maintaining substance use behaviors. Most importantly, it seems from the literature review that these personality characteristics continue to be influential on the recovery processes even after the initiation of treatment. Inabilities in impulse control, affective regulation, motivation for treatment and interpersonal functioning may undermine the effectiveness of conventional approaches to rehabilitation (Muris et al., 2017; Miller et al., 2019). This may increase vulnerability to treatment dropout and relapse.

The results indicate the importance of personality assessment in planning addiction treatment. Acknowledging individual differences in Dark Triad traits may help clinicians identify potential barriers to recovery and develop interventions tailored to personality-related vulnerabilities and substance use symptoms. However, few empirical studies have examined the rehabilitative effects of these traits, though there is some evidence for a large association between Dark Triad traits and substance use disorders. This is an important avenue for future research, particularly in treatment settings and with culturally diverse populations.

Rehabilitation Outcomes: An Integrated Perspective

The reviewed studies' findings suggest that personality, psychosocial and cognitive factors may all play a role in recovery from substance use disorders. There is consistent evidence that deficits in executive functioning, working memory, attention and inhibitory control are associated with poorer engagement with treatment, lower adherence and increased susceptibility to relapse (Goldstein & Volkow, 2011; Rass et al., 2015). Dark Triad personality traits were also found as relevant psychological factors influencing rehabilitation outcomes through impulsiveness, emotional dysregulation, interpersonal problems, and maladaptive coping strategies (Jonason et al., 2015; Miller et al., 2019).

The literature review shows that psychosocial rehabilitation methods such as Cognitive Behavioral Therapy, Motivational Enhancement Therapy, relapse prevention programs and community-based interventions are still effective parts of addiction therapies. However, their effectiveness may be compromised if cognitive deficits and maladaptive personality traits are not sufficiently considered. Narcissistic and Machiavellian traits can get in the way of motivation, therapeutic alliance and participation in recovery behaviours. High psychopathic traits are associated with problems with impulse control and treatment engagement.

Additional evidence suggests that cognitive rehabilitation may be a useful adjunct to psychosocial interventions through improving the cognitive processes necessary for effective engagement in treatment. Better self-monitoring, decision making, working memory and attention may increase the ability to use coping strategies and maintain long-term recovery. Thus, approaches to rehabilitation involving personality-based treatment planning, psychosocial interventions and cognitive training may provide a more holistic approach to helping people with substance use disorders.

Overall findings support the value of integrated rehabilitation approaches. However, the literature is limited by methodological heterogeneity, variations in intervention protocols and the lack of longitudinal studies. Furthermore, there are sparse empirical studies that have investigated the combined effect of cognitive functioning, rehabilitation outcome and dark triad personality traits, especially in the Indian context. These limitations indicate the need for future research on the association between cognitive and psychosocial factors and personality traits in the recovery process.

Future Directions

Despite growing recognition of the role of cognitive functioning and personality characteristics in substance use disorders, there are many important gaps in the literature. Previous research has predominantly focused on the individual effects of cognitive deficits, psychosocial rehabilitation and Dark Triad personality traits on treatment outcomes, rather than their combined effect. This fragmented approach constrains the understanding of the interplay of these factors during the recovery process. Empirical research specifically related to the relationship between rehabilitation outcomes and Dark Triad traits is scarce. Psychopathy, narcissism and Machiavellianism have been associated with substance use behaviors, but few studies have investigated their impact on treatment engagement, adherence, relapse prevention and long-term recovery and Differences in assessment protocols, intervention protocols, sample demographics and outcome measures also limit the generalizability of findings as these differences impede direct comparisons .

Clinical significance

Implications of this review for clinical practice are numerous. In addiction treatment settings, it is recommended that regular screenings of cognitive functioning be conducted at the outset to identify any deficits that might potentially interfere with treatment engagement and recovery. Early recognition of cognitive difficulties can allow for the application of specific cognitive rehabilitation strategies. The findings indicate the need for more comprehensive rehabilitation models that move beyond abstinence-based models and take account of the broader psychological factors that shape recovery. Future research should focus on culturally appropriate and integrated interventions that address the diverse needs of individuals with substance use disorders.

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