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INTEGRATED MANAGEMENT OF SUBSTANCE USE DISORDER

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ABSTRACT

Substance Use Disorder (SUD), also known as drug use disorder, is a condition in which the use of one or more substances lead to a clinically significant impairment or distress. Dependence and Addiction are components of a SUD and addiction represents the most severeform of the disorder. Substance use disorder is a burden to the family and society. Hence the chances of co morbidities and complications are high. It is very much essential to manage the condition at the earliest. Ayurveda described substance use disorder under the context of *madātyaya,* where the detailed explanation regarding alcohol use and its various phases are discussed. Etiopathogenesis of all SUD's are almost similar. Principles of management of *madatyaya* is clinically applicable for every substance use based on assessing the dosa. The management is based on addressing the withdrawal symptoms, cravings and then to address the dependence. *Ayurveda* management including *sirodhara, nasya, snehapana, sodhana, Samana, Rasayana, yoga* are used. The management of substance use is crucial for various reasons such as health and safety, social and economical impact, legal implications, psychological well being and prevention of relapses. Addressing substance use promotes mental health and improves overall quality of life. Further studies are needed to establish the scope of Ayurvedic management in SUD.

KEYWORDS: Substance Use Disorder, Addiction, Dependence, Withdrawal, *Sodhana, Madātyaya.*

INTRODUCTION

Substance use disorder (SUD) is a complex and challenging condition that affects individuals from all walks of life, regardless of age, gender, or socioeconomic status. It encompasses a range of behaviours and symptoms related to the recurrent use of substances such as alcohol, drugs, or medications, leading to significant impairment or distress.[1]

At its core, SUD involves a compulsive pattern of substance use despite negative consequences, including health problems, relationship difficulties, legal issues, and impaired functioning in various aspects of life. This disorder is characterized by a loss of control over substance use, cravings, tolerance (needing more of the substance to achieve the desired effect), and withdrawal symptoms when substance use is reduced or stopped.[2]

The impact of SUD extends beyond the individual, affecting families, communities, and society as a whole. It can lead to a wide range of adverse outcomes, including job loss, financial instability, homelessness, and involvement in criminal activity. Understanding SUD requires a comprehensive approach that considers biological, psychological, and social factors. Treatment typically involves a combination of pharmacotherapy, psychotherapy, behavioural interventions, and support services aimed at addressing the underlying causes of the disorder, managing symptoms, and promoting long-term recovery.[3]

By fostering greater awareness, reducing stigma, and providing effective interventions and support and work towards preventing and mitigating the devastating effects of SUD helping individuals reclaim their health, well-being, and quality of life.[4]

Prevalence

Globally the prevalence of mental and substance use disorders around the world based on the impact of geographical, sociodemographic, and income characteristics on national epidemiological differences. The worldwide prevalence of substance-use disorders is estimated as 2.2%[5]. In Indian scenario the prevalence of consumption was 47.9% for smoking tobacco, 12.7% for cannabis, and 20.1% for alcohol. Amongst, the prevalence of dependence or misuse was 68% for smoking tobacco, 70.6% for cannabis and 63% for alcohol. The most frequent associations of substance were tobacco-alcohol (8.1%) and tobacco-cannabis (3.7%).[6]

Table 1: Substances – Types.

CLASS	DRUGS	EFFECTS
Depressants	▪ Alcohol ▪ Opioids (heroin, morphine) ▪ Cannabis (marijuana,hashish) ▪ Tranquillisers and hypnotics Inhalants (petrol, glue, paint thinners	Depressants slow down, or depress, the central nervous system. They do not necessarily make the user feel depressed.
Hallucinogens	▪ LSD (lysergic acid diethylamide) ▪ Magic mushrooms(psilocybin) ▪ Ecstasy (MDMA) ▪ Cannabis	Alter sensory perceptions
Stimulants	▪ Amphetamine ▪ Cocaine ▪ Tobacco and nicotine ▪ caffeine	Stimulants speed up or stimulate the central nervoussystem and can make the user feel more awake, alert or confident

Risk factors

Substance abuse is affected not only by individuals' environments or backgrounds but also by other factors such as age, interpersonal trauma, ethnicity, gender, academic stress for those aged 18-25 years, long-term use of prescribed medication, and socioeconomic status.[7]

The other risk factors in substance use are mental illness, poor family relationships, inadequate supervision over adolescent's activities, use of drugs by friends, behavioral problems combined with poor parenting, poor achievement in life, drug use in the school, peer group or community, availability of drugs.[8] These all can be categorized as individual, familial, and community factors.

The individual risk factors are traits of high impulsivity, rebelliousness, emotional regulation impairment, low religious, pain catastrophic, homework completeness, having psychiatric disorders such as conduct problems and major depressive disorder etc. The familialrisk factors were prenatal maternal smoking, poor maternal psychological control, low parentaleducation, poor supervision, and the presence of substance-using family members. Onecommunity risk factor is having peers who abuse drugs.[9]

Stages

Those struggling with substance abuse may go through different stages before it results in addictions. The stages begin with experimentation, regular use, dependence, and ends in addiction.[10]

In experimentation, trying different substances with one's peers, sometimes with the goal of disobeying one's parents or other authority figures, next stage is regular use which involves using the substance more often, displaying an increased ability to handle the substance, and starting to develop a tolerance to it.

In dependence stage when the person's body adapts to the substance, need more and more of it to achieve the same effect. Finally addiction is a worst condition in which the person cannot face everyday life without it. In addiction stage the pleasure or euphoria, the high from drugs is still poorly understood, but probably involves surges of chemical signalling compounds including the body's natural opioids (endorphins) and other neurotransmitters in parts of the basal ganglia (the reward circuit). When some drugs are taken, they can cause surges of these neurotransmitters much greater that the smaller bursts naturally produced in association with healthy rewards such as eating, hearing or playing music, creative pursuits, or social interaction.[11]

Recent scientific advances have led to a understanding the multiple neurotransmitter systems play a key role in SUD.[12]

It was once thought that surges of the dopamine produced by drugs directly caused the euphoria, but scientists now think dopamine has more to do with getting us to repeat pleasurable activities (reinforcement) than with producing pleasure directly.[13]

Some other neurotransmitters also have a role in addiction. Endorphins act specifically as neurotransmitters for opiates such as heroin, morphine etc. Serotonin is the neurotransmitter primarily associated with hallucinogenic drugs. Serotonin mainly affects sexual desire and sleep during active drug use, but upon cessation can cause significant disruptions in the normal healthy functioning of both. Drugs including sedatives and tranquilizers stimulate and interfere with processes related to GABA function. This effects are due to its sedative action and CNS-repressing behavior.[14]

Criteria- Substance Use Disorder

Substance use disorders span a wide variety of problems arising from substance use, and cover 11 different criteria[15]

- Taking the substance in larger amounts.
- Wanting to cut down or stop using the substance but not managing to.

- Spending a lot of time getting, using, or recovering from use of the substance,
- Cravings and urges to use the substance.
- Not managing to do work, home, or school because of substance use.
- Continuing to use, even when it causes problems in relationships.
- Giving up important social, occupational, or recreational activities because of substance use.
- Using substances again and again, even when it puts in danger.
- Continuing to use, even when know physical or psychological problem that could have been caused or made worse by the substance.
- Needing more of the substance to get the effect (tolerance).
- Development of withdrawal symptoms, which can be relieved by taking more of the substance.

These are the 11 criteria outlined in the DSM-5-TR can be grouped into four primary categories: physical dependence, risky use, social problems, and impaired control.[15]

ICD 11 changes in substance use disorders

Globally, the need for treatment for SUD did not yet reach a satisfying level and the changes introduced in the ICD-11 in terms of opportunities for improved monitoring, prevention and treatment and for restructuring of health services in such a way that patient-cantered care is prioritized.[16] In order to facilitate data collection on their public health impact, some psychoactive substances have been added in the ICD-11 due to their increasing global importance.[17] synthetic cannabinoids, cocaine, synthetic cathinones, and methylene dioxyphenethylamine (MDMA) are some of the examples of that.

Distinct categories for pattern of use included in the ICD-11, the DSM-5, instead, considers only one "Substance use disorder" category, and identifies three levels of severity depending on the number of recognized symptoms among a list of 11. Although there is a noticeable similarity between the DSM-5, 11 classifications for SUD and the three ICD-11 categories, a number of cases detected with DSM-5 would not find correspondence in the ICD-11: diagnosis of SUD in ICD-11 requires two out of three items, while in DSM-5 two out of 11. "Craving" and "Recurrent use in situations which are physically hazardous" are two items of DSM-5 that are not included nor have a correspondence in ICD-11. Furthermore, all the items related to a substance taking over in daily life activities described in the DSM-5: time spent using or obtaining substances, failure to fulfill role obligations, continued use despite social or

interpersonal problems, important activities given up, and continued use despite physical or psychological problems, in ICD-11 are represented in only one category: "increasing precedence of substance use over other aspects of life.[18]

SUBSTANCES - TYPES

Cannabis

Cannabis sativa has Δ^9-tetrahydrocannabinol (Δ^9-THC0, as its main psychoactive compound.[19] The use of cannabis has been associated with several psychological, behavioral, and social problems. Besides the chronic effects of the continued use of cannabis, such as dependence, abstinence, varying degrees of cognitive impairment, and increased risk of respiratory disorders, its acute effects have also been related to significant physical and mentalhealth problems.[20]

The intoxication by cannabis is associated with symptoms of euphoria, perceptual distortion, continuous giggling, sedation, lethargy, impaired perception of time, difficulties in the performance of complex mental processes, impaired judgment and social withdrawal.[8] In addition, physical signs of conjunctival hyperaemia, increased appetite, dry mouth, and tachycardia can develop in the period of approximately two hours after the use of the substance. The most common features of cannabis withdrawal are anxiety, irritability, anger or aggression, disturbed sleep/dreaming, depressed mood and loss of appetite. Less common physical symptoms include chills, headaches, physical tension, sweating and stomach pain. Symptom onset typically occurs 24-48 hours after cessation and most symptoms generally peak at days 2-6, with some symptoms lasting up to 3 weeks or more in heavy cannabis users.[21]

3,4-methylenedioxymethamphetamine (MDMA)

MDMA (3-4 methylenedioxymethamphetamine) is a synthetic, psychoactive drug with a chemical structure similar to the stimulant methamphetamine and the hallucinogen mescaline. MDMA is an illegal drug that acts as both a stimulant and psychedelic, producing an energizing effect, as well as distortions in time and perception and enhanced enjoyment from tactile experiences. MDMA is a Schedule I substance under the Controlled Substances Act, which means that it has no medical benefit and a high potential for abuse.

MDMA produces an emotional state with heightened mood, increased self-confidence and extroversion, moderate derealization, and an intensification of sensory perception.[22] Physically, it produces a marked increase in wakefulness, endurance and sense of energy,

sexual arousal and postponement of fatigue and sleepiness. The accompanying psychological effects are described as a sense of euphoria, well-being, sharpened sensory perception, greater sociability, extraversion, heightened sense of closeness to other people andgreater tolerance of their views and feelings.[23] In general, the effects desired by most users arethose produced by low doses on single occasions. Withdrawal symptoms are feel depressed, feel tired or weak, change in appetite, trouble concentrating, and feeling anxious, restless, or irritable.[24]

Lysergic Acid Diethylamide (LSD)

LSD is one of the halogenic substance.[25] Which induces bliss, audiovisual synaesthesia, alteredmeaning of perceptions, derealization, depersonalization, and mystical experiences on use. These subjective effects of LSD were mediated by the 5-HT2A receptor. LSD increased feelings of closeness to others, openness, trust, and suggestibility. LSD impairs the recognition of sad and fearful faces, reduced left amygdala reactivity to fearful faces, and enhanced emotional empathy. LSD acutely produced deficits in sensorimotor gating, similar to observations in schizophrenia. LSD had weak autonomic stimulant effects and elevated plasma cortisol, prolactin, and oxytocin levels.[26]

During the withdrawal experience from LSD, some people may have symptoms similar to schizophrenia, such as paranoia or bizarre behaviours. When a person is withdrawing from LSD, they are not likely to experience physical symptoms. The common symptoms of LSD withdrawal includes anxiety, confusions, flashbacks, depersonalizations etc.[27]

Treatment Approaches for Substance Use Disorder

SUD is a chronic disorder that requires a long-term approach. In recent years, pharmacotherapies have been developed and is having an important role in the treatment of SUDs at the levels of detoxification, initial recovery, and relapse prevention. Medications add to the benefits of psychosocial interventions and work synergistically in combination with behavioral therapies.[28]

- **Detoxification**, to help flush the substance out of the person's system. The detox process may need to be undertaken at a hospital or treatment facility if the personis at risk of experiencing severe withdrawal symptoms or health complications. Naltrexone therapy is one of the detox process.[29]
- **Medication**, to treat any withdrawal symptoms, reduce cravings for certain substances,and prevent relapse. Buprenorphine, methadone, and naltrexone are used to treat OUD to

short-acting opioids such as heroin, morphine, and codeine, as well as semi-synthetic opioids like oxycodone and hydrocodone. These medications are safe to use for months, years, or even a lifetime.[30]

- **Therapy**, to help the person explore their motivations and behaviors, cope with stressors and triggers, and address any other mental health conditions they may have. Therapy can be performed on an individual basis or group basis, and may involve partners or family members.
- **Rehabilitation**, which involves staying in a treatment facility for a certain period of time.
- **Mutual-aid groups**, such as Alcoholics Anonymous (AA), Narcotics Anonymous (NA), Cocaine Anonymous (CA), or SMART Recovery that follows a peer-based recovery model.

Ayurvedic approach

There are less number of studies conducted in substance use disorders, the Ayurvedic studies are very minimal and conducted only in the area of alcoholism. Etiopathogenesis of all SUD are almost similar Principles of management of *madatyaya* is clinically applicable for every substance use. Based on the general features of *madatyaya*, we are assessing the dosha status of substance abuse. According to acharaya *Caraka* explains the general signs and symptoms of *madatyaya*. Features can also be interpreted as the signs and symptoms of *dosaja madatyaya.*

If the patient having *Sariradukham* (uncomfortable feeling of body), *Balavat sammoha (*confusion or attraction towards alcohol), *Hrdayavyatha* (uneasiness in the cardiac region or palpitation) etc can be taken as *vataja madathyaya symptomas*. Ushna jvara (hot in touch), bhrama(giddiness), atisara (loose bowel)etc can taken as pittaja symptoms. Seethajvara (cold in touch), hrillasa(nausea), Aruci (anorexia)seen in kaphaja predominant symptoms.[31] The approach varies based on the clinical presentation. Includes Pharmacological and Non-pharmacological approach. An integral component of comprehensive treatment for substance use disorder, helping individuals to achieve and maintain recovery while addressing the complex physiological and psychological aspects of addiction. The management based on addressing the withdrawal symptoms, cravings, then to address the dependence. Follow-up medications play a crucial role in the treatment of SUD's for several reasons such as Relapse Prevention**,** Supporting Behavioral Therapy, Addressing Co-occurring Conditions, Long-Term Recovery, Normalization of Brain Function**,** Improving Quality of Life etc.

Sarngadhara Samhita categorised dravya as Madakari. Which destroys or diminishes budhi, predominance of tamoguna. some of the examples of madakari dravyas are Sura, Sidhu, Varuni etc.[32] As per *Aṣṭāṅgasaṅgraha Indu* commentary, *mada* is the cardinal feature of *madātyaya*.[33] Hence *madya* as the suitable example for *madakāri dravyās*.

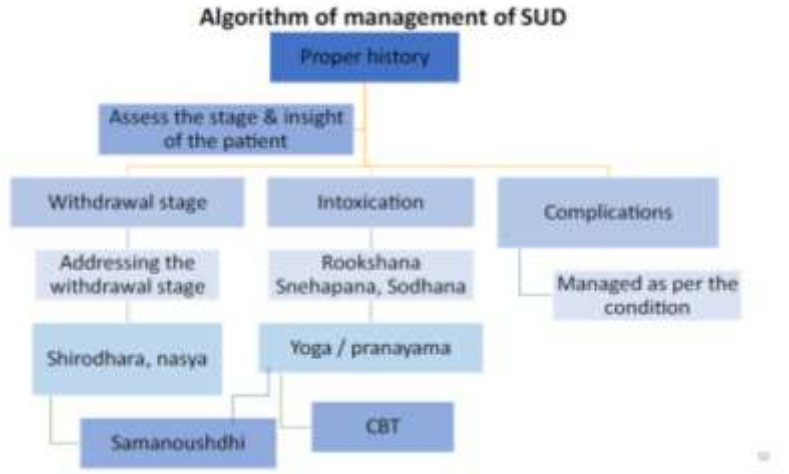

Fig: 1.

This is a detail approach of SUD when a patient come to OP, We have to take a proper history then assess the stage and insight. Whether the patient came in a withdrawal stage we have to addresses the withdrawal stage first with *sirodhara, nasya* etc procedures. If the patient in intoxication stage, managed with *rookshana, snehapana, sodhana* proceduresor if in a complications stage managed as per the condition. For dependence and intoxication, *sodhana* therapy followed by *samana* drugs provides better relief. *Vamana, virechana, nasya*, and *vasthi* are the main *sodhana* therapies useful in such conditions. *Virechana* is the most useful panchakarma therapy to treat addiction disorders. Castor oil, Avipathi churna, etc are some of the medicines used for it. *Vamana* may be administered in cases of *Kapha* dominance with drugs such as *madana, vacha, yashti*, etc are the drug choices. *Samanoushadhi, Rasayana yoga* and CBT help to restore physical and mental health improve the chance of recovery.[34] Familial support is to be ensured with familial education as well as counseling during the therapy

Satwavajaya chikitsa

Sattvavajaya Chikitsa is the nonpharmacological approach for treating the mental disorder. It falls under *Adravya-bhuta Chikitsa*. *Satwavajaya Chikitsa* is administered through *Jnana* (knowledge), *Vijnana* (analytical thinking), *Dhairya* (courage), *Smrti* (memory) and *Samadhi*

(concentration). It is recommended, when apart from medicines these, measures like calming the patient with assurances provide a greater benefit.[35]

From Jnana, spiritual knowledge or knowledge that the absolute atma For attaining this Atmagyana, Acharya Charak introduced the concept of Satya Buddhi, which depicts true knowledge.The emergence of this Satya Buddhi(Samyak Jnana) will decrease the Upadha which is the main cause of all Dukha.[36]

Through Vigyana, knowledge of the scriptures and texts which takes the person towards true knowledge. Shastra teaches the path of Pravrutti (engagement in worldly affairs) or Nivrutti (renunciation) to the people. Dhairya is the third step in satwajaya, The aim is to bring strength or firmness by calming down the vitiated or hyper-excited state of the Manas. i.e. increasing the patience of the person. Smriti is the next stage in which patient trying to memorize the past incidences, as Charakacharya states that only if one remembers the real nature of things he gets rid of miseries. Samadhi is the ultimate stage in the practice of yoga, which is a state of unwavering concentration. Promoting Samadhi in a diseased state is trying to minimize the mental fluctuations, reduce the wavering ultimately leading to focus and tranquilized mind. It is a stage that can be achieved after diverting the Indriyas into Manasa to attain the stage of stillness. Hence there is complete cessation of all types of Vikara or Dukha ot urges.[37]

Jnana < Vigyana < Dhairya < Smriti < Samadhi

Hence, all these five steps of Chikitsa help the patient to get mprovement from their symptoms. Ayurvedic psychotherapy, or *Satvavajaya Cikitsa* has a very important role in SUD management. It is mentioned in Ayurveda so as to provide the awareness of the ill effects of drug addiction and provide the willpower to come out of drug addiction. And also to address the *satwa* as well.[38]

It is also important to improve the emotional intelligence through positive training and programming of mind and brain to cope with the adverse situation by the cognitive behavior therapy, rational emotive behavior therapy etc. Thus, a multidisciplinary response is needed to address the burden and impact of SUD which calls for an integrated and multipronged approach. Care, prevention, and rehabilitation. Service delivery, capacity building, integration into the existing program, mobilizing public support, and increasing public awareness will be the hallmarks of such an integrated approach in a public health.

Group therapy

Group Therapy, which is a psychoeducational group, offering individuals a supportive and nonjudgemental environment to address their issues. Group therapy help to reduce feelings of isolation, guilt, and shame, reduces drug or alcohol cravings, prevent treatment drop-out, increase motivation by allowing to witness the recovery of others, offer comfort and help guide people who are struggling or in the early stages of recovery, reinforce a sense of accountability for maintaining abstinence/continuing drug treatment, offer structure in one's day-to-day life, help raise awareness of the consequences of chronic drug use or abuse. Group treatment approaches seem to be more effective at improving positive outcomes (e.g., abstinence, use rates, objective measures, urine analysis) when compared to standard care without group and those who refuse and drop out of treatment.[39] Alcoholics Anonymous (AA), Narcotics anonymous (NA), Cocaine Anonymous (CA) some of the examples.

FAMILY THERAPY

In SUD treatment, family counseling focuses on how the family influences one member's substance use behaviours and how the family can learn to respond differently to that person's substance misuse. When family members change their thinking about and responses to substance misuse, the entire family system changes. These systems-level changes lead to positive outcomes for the family member who is misusing substances and improved health and well-being for the entire family.[40]

Yoga in SUD

Yoga is a comprehensive system of practices for physical and psychological health and well-being. It is useful in management of withdrawal and intoxication features of SUD and also help to manage the comorbidities. As yoga is a multidimensional approach which includes elements of exercise, meditation, breathing work, as well as concentration, many researchers have tried yoga as a therapy in patients.[41] In SUD swasanakriya, asanas, pranayama, relaxation techniques are mostly used. *Asanas* like *Tadasana, Padahasthasana, Paschimottasana, Sasankasana, Matsyasana, Pavanamuktasana* were mostly used. *Pranayama* especially *Anuloma viloma* and *Bhramari pranayama*, help the patient calm down mental stress while increasing alertness.[42]

The majority of studies suggested the role of yoga in reducing substance use as well as substance-related craving (especially in nicotine-use disorders) in short term.[43] Yoga is being considered as a holistic intervention inducing dopamine homeostasis leading to long-

term benefits in management of addictive behaviours termed as "Reward Deficiency Syndrome.[44]

Legal issues

The area of SUDs raises certain peculiar medicolegal issues. Medicolegal issues primarily concerned with the two major laws – the Narcotic Drugs and Psychotropic Substances Act (NDPS Act) 1985 and the Mental Health Care Act (MHCA) 2017. However, the laws, provide enough opportunity for the psychiatrists to provide ethical and effective treatment to their patients, Provisions of the NDPS Act (1985) which are related to the treatment of SUDs and their implications for psychiatrists.[45]

Previous studies

1. *Pippali Ksheerapaka* in alcohol dependence - in this study trial group was administered given *Snehapanam (Dhathryaadi ghrutha), Abhyanga Ushmaswedam (aarukalaadi tailam, mruduswedam-ushnaambusnaanam), sodhana-avipathi churna* 20g with warm water and in Group 2 (control) given *Pippaleeksheerapaka* -100ml, bd A/f for 30 daysand CBT -3 sessions /week. The study concluded that the trial and control, both are found equally effective in study period. Trial able to maintain efficacy in follow-up period also.[46]
2. Concept of substance abuse w.s.r to *Ānandakandam – Vijayākalpam*. Considering the morphological characters cannabis is most similar to Vijaya. Also the pharmacological properties and actions of vijaya. Line of management also noticed as *pitta śamanan*. The study concluded that vijaya vikara represents various stages of intoxication starting from the early physiological changes to cannabis psychosis only.[47]
3. Ayurvedic Treatment Protocol In Cannabis Use Disorder – It includes initial *sirodhāra* for addressing withdrawal symptoms, then *snehapana* followed by *virecana* inorder to address the dependence. The protocol is *Uśīra kvātha* for *Śirodhāra Kharjūrādi mantha* as internal medicine, *Dhātryādi ghṛta* for *snehāpana, Ksīrabala taila* for external application, *Avipatti cūrṇa* for *virechana, Yaşţi cūrṇa – Samana*. The study concluded that the selected Ayurvedic treatment protocol has significant effect in the management of Cannabis Use Disorder and also in quality of life.[48]

CONCLUSION

SUD's are chronic relapsing disorders, leading to significant impairment in psychosocial functioning. Conventional therapies not able to provide expected outcome and frequent

relapses reported. *Ayurveda* has a definite role in various stages of SUD. Individualised *dosha* based approach seems helpful for getting better outcome. The treatment plan is determined bythe *Doshavastha*. To provide the patient with symptomatic relief, the treatment focuses on balancing *Tri Dosha (Vata, Pitta,* and *Kapha).* Panchakarma procedures such as *nasya, virechana, abhyanga,* and *sirodhara* with suitable medicines are observed to be effective in reducing withdrawal symptoms, along with internal medicines. For dependence and intoxication, *sodhana* therapy followed by *samana oushadha* provides better relief. *Vamana, virechana nasya*, and *vasthi* are the main *sodhana* therapies useful in such conditions, as per the predominance of the *dosha*. Prevention of relapse should be done with *rasayana*, *yoga*, and*satvavajaya* measures. *Ayurveda* offers a holistic approach to substance use disorder, focusing on physical, mental, and spiritual well being. Multi disciplinary approach including *Ayurveda,yoga*, psychotherapy etc promoting recovery and reducing the risk of relapse. However, further researches are needed to establish the scope of Ayurvedic management.

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