

# DERMATOLOGICAL SYMPTOMS IN ALCOHOL AND SUBSTANCE USE DISORDERS: A REVIEW WITH CURRENT LITERATURE

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**Dermatological Symptoms in Alcohol and Substance Use Disorders: A Review with Current Literature**

**Alkol ve Madde Kullanım Bozukluklarında Dermatolojik Belirtiler: Güncel Literatür ile Bir Derleme**

## ABSTRACT

Alcohol and substance use disorders (ASUD) are chronic, relapsing psychiatric conditions with significant individual and public health implications. While their neuropsychiatric effects are well documented, their dermatological manifestations often remain under-recognized in clinical practice, leading to delays in diagnosis and treatment. This narrative review systematically explores skin findings associated with the use of alcohol, cannabis, hallucinogens, inhalants, opioids, stimulants, and tobacco, based on recent literature. Alcohol is frequently linked with telangiectasias, seborrheic dermatitis, pruritus, and rosacea-like eruptions. Opioid use often results in pruritus, ulcerations, and scarring at injection sites. Stimulants such as cocaine and amphetamines are associated with vasculitic rashes, formication-induced excoriations, and ulcerative dermatoses. Cannabis, hallucinogens, and inhalants may cause contact dermatitis, pigmentary changes, and perioral lesions. Tobacco use, though legally sanctioned, significantly contributes to premature skin aging and exacerbation of chronic inflammatory dermatoses. Early recognition of these dermatologic signs may serve as clinical clues, aiding in the timely diagnosis of ASUD. Integrating dermatological evaluation into addiction treatment protocols can improve outcomes and reduce unnecessary investigations. This review emphasizes the importance of skin manifestations in ASUD and encourages greater clinical attention and multidisciplinary collaboration in addressing these often-overlooked indicators.

**Keywords:** Addiction, Alcohol use disorder, Dermatologic manifestations, Psychodermatology, Skin diseases, Substance-related disorders

## ÖZET

Alkol ve madde kullanım bozuklukları (AMKB), bireysel ve toplumsal sağlık açısından ciddi sonuçları olan, kronik ve nüks etme eğiliminde olan psikiyatrik durumlardır. Bu bozuklukların nöropsikiyatrik etkileri iyi belgelenmiş olmakla birlikte, dermatolojik yansımaları klinik uygulamalarda sıklıkla göz ardı edilmekte ve bu durum tanı ile tedavide gecikmelere neden olabilmektedir. Bu derleme, güncel literatür temelinde; alkol, kannabis, halüsinojenler, inhalanlar, opioidler, uyarıcılar ve tütün kullanımı ile ilişkili deri bulgularını sistematik bir şekilde incelemektedir.

Alkol kullanımı sıklıkla telenjiyektazi, seboroik dermatit, pruritus ve rosacea benzeri döküntülerle ilişkilidir. Opioid kullanımı ise enjeksiyon bölgelerinde pruritus, ülserasyonlara ve skar oluşumuna yol açabilmektedir. Kokain ve amfetamin gibi uyarıcı maddeler, vaskülitik döküntüler, formikasyon (deri altı böcek dolaşmış hissi) sonucu gelişen ekskoriasyonlar ve ülseratif dermatozlarla ilişkilendirilmiştir. Kannabis, halüsinojenler ve inhalanlar temas dermatiti, pigmentasyon değişiklikleri ve perioral lezyonlara neden olabilir. Yasal kullanımına rağmen, tütün; cildin erken yaşlanmasına ve kronik inflamatuvar dermatozların şiddetlenmesine önemli ölçüde katkıda bulunur.

Bu dermatolojik belirtilerin erken fark edilmesi, AMKB'nin zamanında tanısına katkı sağlayabilecek klinik ipuçları sunabilir. Bağımlılık tedavi protokollerine dermatolojik değerlendirmelerin entegre edilmesi, tanıl sürecin etkinliğini artırabilir ve gereksiz tetkiklerin önüne geçebilir. Bu derleme, AMKB'de görülen deri bulgularının önemine dikkat çekmekte ve bu sıklıkla göz ardı edilen göstergelerin değerlendirilmesinde klinik farkındalığın ve multidisipliner iş birliğinin artırılması gerektiğini vurgulamaktadır.

**Anahtar Kelimeler:** Alkol kullanım bozukluğu, Bağımlılık, Dermatolojik bulgular, Deri hastalıkları, Madde ilişkili bozukluklar, Psikodermatoloji

## INTRODUCTION

Alcohol and substance use disorders (ASUD) are complex and recurrent public health problems that cause serious physical, mental, and social problems affecting individuals not only on an individual level but also on a family and social level. According to data from the World Health Organization for 2023, approximately 2.6 million people have been diagnosed with alcohol dependence, while 35 million people live with various substance use disorders (1). A significant proportion of these individuals are evaluated alongside psychiatric comorbidities and severe organic disorders, and often face various barriers to accessing healthcare services (2,3,4).

While the effects of ASUD have traditionally been addressed primarily at the neuropsychiatric level, recent studies have highlighted the systemic effects of these disorders, prompting a more holistic approach. In this context, one of the most notable and clinically significant areas is dermatology. Skin changes in individuals who use alcohol and substances are often overlooked. However, since the skin is highly sensitive to external toxins and internal metabolic disorders, the first physical signs of addiction often manifest here.(5)

### Epidemiological Findings and Frequency of Dermatological Symptoms

Epidemiological studies have shown that more than 60% of substance users exhibit at least one dermatological symptom. The most common findings include telangiectasia, pruritus, jaundice, infectious dermatoses, excoriations, ulcerations, and scars (6,7). The incidence of complications such as abscesses, cellulitis, and necrotizing fasciitis, particularly those associated with intravenous substance use, has increased significantly (4,8). Additionally, each of the cannabis, opioid, stimulant, hallucinogen, and volatile substance groups has been associated with distinct dermatological presentations.

### Pathophysiology: Why Is the Skin Affected?

Various mechanisms contribute to the development of dermatological problems associated with alcohol and substance use. These substances:

- Suppress the immune system, increasing susceptibility to infections (viral, bacterial, fungal) (9),
- Impair liver and kidney function, leading to symptoms such as jaundice, dry skin, and itching,
- Causing psychodermatological syndromes such as dermatitis artefacta, formication, and delusional parasitosis through neuropsychiatric effects (10),
- Resulting in chronic dermatoses and non-healing ulcers due to poor hygiene, inadequate nutrition, and traumatic injection techniques.

## Diagnostic Delays

Dermatological symptoms associated with ASUD are often diagnosed late or overlooked. The main reasons for this include patients' reluctance to share their history of substance use, clinicians' failure to adequately investigate the systemic origins of dermatological symptoms, and stigma surrounding substance use in society (11).

However, recent studies have shown that dermatological symptoms can be used as valuable biomarkers in the diagnosis of addiction disorders. Multidisciplinary assessment protocols developed in this context create an effective environment for collaboration between psychiatry and dermatology specialists. Dermatologists' ability to correctly recognize and refer these symptoms plays a major role in ensuring early diagnosis and preventing complications (12,25).

### Aim of the review

A significant portion of the existing literature on dermatological findings related to alcohol and substance use remains at the case report level, while large-scale and comparative studies are quite limited (12). This review, prepared to address this gap, examines the effects of different substance groups, such as alcohol, cannabis, opioids, stimulants, hallucinogens, volatile substances, and tobacco, on the skin in detail, based on the current literature.

For each substance type, the pathophysiological mechanisms, prevalence, differential diagnoses, and multidisciplinary treatment approaches of related dermatological symptoms are discussed, and recommendations are provided on how this information can be integrated into clinical practice.

## ALCOHOL-RELATED DISORDERS AND DERMATOLOGICAL SYMPTOMS

### Definition and Pharmacodynamic Properties

Alcohol use disorder (AUD) is a chronic and progressive disease characterized by an individual's inability to control their alcohol consumption, continued drinking despite this inability, and serious impairments in social, occupational, and physical functioning as a result. According to the DSM-5-TR, at least two diagnostic criteria must be met within the past 12 months for a diagnosis to be made; these criteria include the development of tolerance, withdrawal symptoms, inability to limit alcohol consumption, neglect of responsibilities, and physical harm related to alcohol use (1,2).

Ethanol, the active ingredient in alcohol, has a dual effect on the central nervous system, stimulating GABA-A receptors and increasing inhibitory signals, while suppressing NMDA-type glutamate

receptors and reducing excitatory signals (6,9). This pharmacodynamic mechanism provides sedative and anxiolytic effects with short-term use, but in the long term, it disrupts neurochemical balance, leading to the development of tolerance and dependence. Additionally, it affects the dopaminergic mesolimbic system, activating the reward system and strengthening psychological dependence (8).

In addition to its systemic effects, ethanol has been shown to directly or indirectly affect the skin. Impaired liver function, hormonal changes, vitamin deficiencies, weakened immune system, and changes in vascular structure contribute to the development of various alcohol-related dermatological issues (4).

### Epidemiology

Alcohol is one of the most widely available and commonly consumed psychoactive substances worldwide. According to the World Health Organization's 2023 report, approximately 3 million people die prematurely each year from alcohol-related causes; more than 25% of these deaths occur in individuals aged 20–39 (3,7). While Europe ranks first in per capita alcohol consumption, consumption in Turkey is lower overall, although there is an upward trend, particularly among young adults (10).

There are significant differences in the distribution of AUD by gender. Alcohol use disorder is more common in men, but women are physiologically more sensitive to alcohol and may experience more severe systemic consequences with smaller amounts of alcohol. In women, liver damage, neuropsychiatric complications, and the endocrine effects of alcohol may manifest earlier and more severely (12). However, genetic predisposition, childhood trauma, co-occurring mental disorders, and low socioeconomic status are prominent risk factors for the development of AUD (8,11).

### Diagnostic Classification

In the DSM-5-TR system, alcohol-related disorders are classified under five headings: alcohol use disorder, alcohol intoxication, alcohol withdrawal, alcohol-induced psychotic disorders, and alcohol-induced amnestic disorders (e.g., Wernicke-Korsakoff syndrome) (1,2). In the diagnostic process, not only clinical observation but also psychometric assessment tools and laboratory findings are of great importance. Screening scales such as AUDIT and CAGE, along with the evaluation of biochemical markers such as Gamma Glutamyl Transferase level, AST(Aspartate Aminotransferase)/ALT(Alanine Aminotransferase) ratio (>2), and CDT (Carbohydrate-Deficient Transferrin), provide important clues about chronic alcohol use.

Alcohol-related dermatological symptoms can be diagnostically significant, especially when the patient hides or inadequately reports their alcohol use history.

Certain specific findings observed on the skin can provide important information about the underlying systemic condition (13).

### Dermatological Symptoms

Dermatological findings associated with alcohol use are often considered to be reflections of systemic pathologies on the skin. The most common lesions can be classified as follows:

- **Palmar Erythema and Spider Angiomas:** Chronic alcohol use leads to impaired liver function, resulting in increased estrogen levels, which cause peripheral blood vessels to dilate. This can manifest as redness in the palms (palmar erythema) and typical spider-like blood vessel structures (spider angiomas).
- **Porphyria Cutanea Tarda (PCT):** Alcohol contributes to the development of PCT by inhibiting the activity of the uroporphyrinogen decarboxylase enzyme. It is characterized by blisters, atrophy, and hyperpigmentation in light-sensitive areas (4).
- **Pruritus and Excoriations:** Bile acids that accumulate in cholestatic liver diseases can cause severe itching. This condition is quite common in chronic alcoholics, and scratching can result in scratches and wounds (excoriations) on the skin.
- **Rosacea and Vasodilation-Related Erythema:** Alcohol consumption can cause temporary redness on the facial skin. Over time, this condition may develop into permanent rosacea, with telangiectasia and papulopustular lesions (9).
- **Dermatoses Associated with Vitamin Deficiencies:** Alcohol use can lead to deficiencies in vitamins B1, B3, and B6, causing skin changes similar to glossitis, cheilitis, seborrheic dermatitis, and pellagra (14).
- **Skin Infections:** Alcohol suppresses the immune system, making the skin susceptible to infections. Candida infections, dermatophytoses, and pyogenic skin infections are particularly common.

### Differential Diagnosis and Clinical Significance

Alcohol-related dermatological findings may resemble those of other diseases. For example, palmar erythema is also associated with thyrotoxicosis or rheumatoid arthritis. PCT may resemble connective tissue diseases such as systemic lupus erythematosus, while rosacea-like facial redness may also occur after carcinoid syndrome or corticosteroid use.

Therefore, careful evaluation of any skin lesions, supported by systemic questioning and a detailed history of alcohol use, is of great importance for diagnostic accuracy (7). Skin findings may be the first indication

of systemic problems such as hepatic dysfunction, immunodeficiency, or nutritional deficiencies that may not yet be apparent in the patient.

### **Treatment and Follow-up Approach**

While symptomatic treatment of dermatological findings is important, complete recovery is not possible without managing the underlying alcohol use. For example, phlebotomy, low-dose hydroxychloroquine, and photoprotection are the mainstay of PCT treatment (4). Antihistamines, cholestyramine, and moisturizers can be used for pruritus. In rosacea treatment, topical agents containing metronidazole, azelaic acid, and ivermectin are effective (12).

In addiction treatment, pharmacotherapy (naltrexone, acamprosate, disulfiram) should be integrated with psychosocial approaches such as psychoeducation, individual therapy, and group therapy (8). Collaboration between dermatologists, psychiatrists, internists, and hepatologists during this process will increase treatment success (11).

## **CANNABIS-RELATED DISORDERS AND DERMATOLOGICAL SYMPTOMS**

### **Definition and Pharmacodynamic Properties**

The cannabis plant (*Cannabis sativa*) is considered one of the most widely used illegal substances worldwide due to its psychoactive effects. The primary active component in its composition, delta-9-tetrahydrocannabinol (THC), exerts its effects through CB1 receptors in the central nervous system, thereby producing a psychoactive response. However, cannabidiol (CBD), a non-psychoactive component other than THC, plays a role in various physiological mechanisms due to its anti-inflammatory and analgesic properties (1,8). The effects of THC on the dopaminergic and serotonergic systems can lead to dependence, tolerance development, and various neuropsychiatric symptoms with long-term use (4,7).

### **Epidemiology**

Cannabis use is particularly prevalent among adolescents and young adults. According to global estimates, approximately 200 million people use cannabis regularly (2,9). Statistics from the United States as of 2023 show that 18% of young adults have used cannabis in the past 30 days (6). While the usage rate in Turkey is relatively lower, a noticeable increase has been observed in recent years (10).

### **Diagnostic Classification**

The DSM-5-TR classifies cannabis-related disorders under the following headings: use disorder, withdrawal, intoxication, cannabis-induced anxiety, psychotic, and depressive disorders (1). In the clinical course, the

gradual development of tolerance and the emergence of behavioral changes are notable. During the diagnostic process, the patient's method of use (cigarettes, oil, drops, edibles, etc.) should be inquired about, and any accompanying dermatological findings should be carefully examined (8).

### **Dermatological Symptoms**

Skin findings associated with cannabis use can arise through direct contact as well as immunological and behavioral effects. The most commonly reported dermatological findings are as follows:

- **Allergic Contact Dermatitis:** Direct contact with the cannabis plant may lead to lesions characterized by erythema, itching, and vesicles in susceptible individuals. These reactions are often associated with delayed-type hypersensitivity to plant irritants.
- **Cannabinoid Hyperemesis Syndrome (CHS) and Water-Related Dermatological Damage:** CHS, which occurs in chronic cannabis users, is characterized by recurrent nausea, vomiting, and the behavior of taking hot showers. This behavior may lead to skin lesions such as thermal irritation, erythema, and lichenification over time.
- **Seborrheic Dermatitis and Acneiform Lesions:** Due to cannabis's sebaceous gland-activating effect, acneiform eruptions may be observed on the face, back, and trunk (11). Although CBD has anti-inflammatory potential, products with unbalanced content may trigger inflammation.
- **Fungal and Bacterial Infections:** Cannabis' immunosuppressive effect may increase susceptibility to dermatophyte infections, candidiasis, and pyogenic skin infections. These infections are most commonly reported in intertriginous areas, nails, and scalp.
- **Photodermatoses and Pigmentation Disorders:** Due to THC's ability to affect melanin synthesis, some users may experience hyperpigmentation and photoreactivity (13). In cases where synthetic cannabinoids are used, there have been reports of phototoxic reactions.

### **Differential Diagnosis and Clinical Significance**

Cannabis-related dermatological findings may clinically resemble many skin diseases. Allergic contact dermatitis may be confused with atopic dermatitis or metal allergies, CHS-related irritant dermatitis may be confused with atopic eczema, and seborrheic dermatitis may be confused with seborrheic psoriasis (9). Acneiform lesions may resemble acne or folliculitis that develops after steroid use.

Recognizing these findings not only helps determine appropriate dermatological treatment but also provides

an important opportunity to identify underlying and often hidden substance use disorders (7). Cannabis use should be investigated in young individuals presenting with sudden onset and widespread rashes.

### **Treatment and Follow-up Approach**

The treatment approach should be determined based on the cause of the dermatological findings. In cases of allergic contact dermatitis, topical corticosteroids, oral antihistamines, and cessation of contact are the primary approach. In skin lesions associated with CHS, in addition to alleviating symptoms, complete cessation of cannabis use is necessary. Multidisciplinary evaluation and follow-up are important in these patients.

In fungal infections, topical or systemic antifungal treatments may be used; in acneiform lesions, benzoyl peroxide, topical retinoids, and antiseptic agents may be used (11). In toxic dermatological reactions associated with synthetic cannabinoids, the opinion of toxicology specialists should be sought.

From a psychiatric support perspective, methods such as motivational interviewing, cognitive-behavioral therapy, and group therapy have been shown to be effective in individuals diagnosed with CUD (4). In long-term follow-up, the level of improvement in dermatological lesions can be used as an objective indicator to monitor the success of the cessation process.

## **HALLUCINOGEN-RELATED DISORDERS AND DERMATOLOGICAL SYMPTOMS**

### **Definition and Pharmacodynamic Properties**

Hallucinogens are psychoactive substances that cause significant changes in sensory perception and primarily exert their effects through serotonin 5-HT<sub>2A</sub> receptors. The most well-known compounds in this group include lysergic acid diethylamide (LSD), psilocybin, mescaline, dimethyltryptamine (DMT), and ayahuasca (1). While naturally occurring hallucinogens such as psilocybin and DMT have historically been used in ceremonial or religious rituals, synthetic hallucinogens such as LSD are used in modern times for both recreational purposes and experimental psychotherapy (4).

These substances produce psychotropic effects such as visual hallucinations, distortions in time perception, and a sense of detachment from reality. With long-term use, individuals may develop tolerance and experience persistent perceptual disturbances such as hallucinogen residue disorder (flashback syndrome) (2,7,8). While some recent studies have highlighted the positive effects of low-dose psilocybin or LSD on psychiatric conditions such as depression, anxiety, and post-traumatic stress disorder (PTSD), it has been reported that unconscious or recreational use may lead to serious neuropsychiatric and dermatological complications (3,5,9).

### **Epidemiology and Usage Trends**

Hallucinogens are among the most widely used substances globally, with approximately 0.9% of individuals aged 15–34 having tried such substances at least once in their lives, according to 2022 data (10). In Western Europe and North America, there has been a notable increase in the use of LSD and psilocybin over the past decade (6).

### **Diagnostic Classification**

In the DSM-5-TR system, hallucinogen-related disorders are addressed under four main headings: hallucinogen use disorder, hallucinogen intoxication, hallucinogen residual disorder (flashback), and hallucinogen-induced psychotic disorder (1,7). One of the characteristic effects of hallucinogens, “perceptual distortions,” can result in visual impairments becoming permanent in some cases (2).

In addition to structured interviews, a detailed assessment of substance use history and accompanying physical symptoms is necessary during the diagnostic process. In particular, the frequent use of hallucinogens in combination with other psychoactive substances increases the complexity of the clinical picture (6,10).

### **Dermatological Symptoms**

Skin problems associated with hallucinogen use develop through various mechanisms. These effects may arise as a result of toxic contact, self-harming behavior, immunological reactions, and interaction with environmental factors:

- **Self-Inflicted Skin Damage (Autodermatological Trauma):** Individuals under the influence of hallucinogens may harm their skin, particularly when experiencing psychotic symptoms such as formication (the sensation of insects crawling under the skin). This typically results in scratches, wounds, and ulcerative lesions (4).
- **Burns and Traumatic Lesions:** Serious heat-related burns, bite marks, or cuts have been reported in some individuals associated with LSD or DMT use. Such traumatic lesions are often associated with impaired consciousness and uncontrolled behavior (8,11).
- **Phototoxic Reactions and Pigmentation Changes:** Exposure to sunlight after using plant-based hallucinogens can cause pigmentation disorders and blistering. Substances such as ayahuasca and peyote have been associated with such reactions.
- **Toxic Contact Dermatitis:** Contact dermatitis developing after contact with psilocybin-containing mushrooms may present with edema, erythema, and vesicles on the skin. Some users have reported urticaria-like rashes after ayahuasca use (9).

- Injection Sites and Subcutaneous Lesions: Intravenous DMT use may result in ulceration, tissue necrosis, and local infections at injection sites (12).

### Differential Diagnosis and Clinical Significance

Hallucinogen-induced dermatological findings may resemble other dermatoses. For example, formication and associated skin lesions may be confused with delusional parasitosis; burns and cuts may be mistaken for traumatic events or suicide attempts (4,11). Similarly, phototoxic pigmentation changes may be confused with conditions such as porphyria or systemic lupus erythematosus, while contact dermatitis may be mistaken for atopic dermatitis.

Accurate identification of these lesions can provide clues for diagnosis in patients who avoid disclosing their substance use history. Hallucinogen use should always be evaluated in cases of unexplained recurrent skin findings, especially in younger age groups (8).

### Treatment and Follow-up Approach

The treatment process should be multidisciplinary, involving both dermatological and psychiatric aspects. In the treatment of skin lesions, wound care, antiseptic solutions, and topical antibiotics are preferred in the initial stage. In severe burn cases, a collaborative approach between plastic surgery and dermatology units may be required (12).

For toxic contact dermatitis, topical steroids, oral antihistamines, and avoidance of irritating substances are recommended (9,10). Individuals diagnosed with hallucinogen use disorder following psychiatric evaluation should be supported with behavioral therapies, motivational interviews, and pharmacological treatments if necessary. SSRIs and low-dose antipsychotic treatments may be used for flashback episodes (4).

## DISORDERS RELATED TO VOLATILE SUBSTANCES AND DERMATOLOGICAL SYMPTOMS

### Definition and General Characteristics

Volatile substances (inhalants) are a group of substances that are commonly abused and produce short-term euphoric or psychoactive effects through the inhalation of chemical vapors. Examples of these substances include paint thinner, glue, gasoline, paint thinner, and aerosol-based products. Volatile substances, which are particularly prevalent among adolescents, can contribute to diagnosis by causing noticeable effects on the skin and can also be considered as an external manifestation of systemic toxicity (1).

### Dermatological Findings

Exposure to volatile substances often causes dermatological changes in areas that come into contact

with the mouth, nose, hands, and clothing. These lesions usually arise due to both chemical irritation and mechanical factors:

- Perioral Dermatitis: Direct contact of the mouth area with adhesive and solvent-containing substances causes chronic dermatitis characterized by erythema, peeling, and cracking. This condition often progresses unnoticed and diagnosis may be delayed (10).
- Contact Dermatitis: It can develop through both allergic and irritative mechanisms. In some individuals, widespread erythematous plaque formations known as “baboon syndrome” have been described following the use of volatile substances.
- Frostbite: Contact of liquid gases emitted from pressurized spray cans with the skin can lead to the formation of necrotic lesions due to sudden cooling and freezing (6).
- Dryness and Cracking: Long-term use of volatile substances causes damage to the skin’s barrier function and increased moisture loss, leading to cracking, flaking, and susceptibility to secondary infections (4,7).

Approximately 35% of volatile substance users exhibit such dermatological findings, which often play a critical role in revealing a history of substance use (2).

### Differential Diagnosis and Clinical Significance

Skin changes associated with volatile substance use may resemble some common dermatological diseases:

- Perioral dermatitis vs. steroid-induced dermatitis: Lesions around the mouth may be confused with dermatitis caused by topical steroid use. A detailed patient history and clinical evaluation are decisive in differential diagnosis.
- Contact allergy vs. chemical irritation: Solvent-based adhesives can act as allergens; however, careful evaluation is required due to differences in contact duration and exposure to the substance.
- Frostbite vs. vasculitis: Findings such as bruising, ulceration, and tissue necrosis caused by freezing may resemble some vasculitis conditions and lead to misdiagnosis.

The correct identification of these lesions is important not only for dermatological health but also for revealing the individual’s history of volatile substance use (9).

### Treatment and Follow-up Approach

Treatment for dermatological disorders related to volatile substance use requires both improving local lesions and addressing the underlying substance use

disorder. Therefore, the treatment plan should be developed within a multidisciplinary collaboration framework:

- **Dermatological Approaches:** Topical corticosteroids, barrier-strengthening products, and moisturizers are recommended for perioral and contact dermatitis. In cases of cold burns, careful monitoring should be conducted considering the risk of necrosis, and plastic surgery support should be provided if necessary.
- **Psychiatric Evaluation:** The underlying causes of volatile substance use often stem from psychosocial issues. Factors such as depression, trauma history, or social exclusion should be considered, and the individual should be included in a psychological support process.
- **Education and Rehabilitation:** Educational programs aimed at preventing addiction, especially in children and adolescents, family support, and social service interventions are indispensable components of the treatment process (11,26).

## OPIOID-RELATED DISORDERS AND DERMATOLOGICAL SYMPTOMS

### Definition and Pharmacological Properties

Opioids are powerful pharmacological substances that act on the central nervous system to provide analgesia, sedation, and euphoria. They achieve these effects by binding to endogenous opioid receptors. Substances such as morphine, heroin, methadone, and fentanyl belong to this group and can be found in both natural and synthetic forms (1,7). Regular use of these substances leads to rapid tolerance development, withdrawal symptoms, and eventually addiction.

The prevalence of opioid use disorders worldwide is increasing each year. The World Health Organization (WHO) has reported that, as of 2023, more than 62 million individuals are misusing opioid-containing medications. In Turkey, intravenous heroin use has become widespread, leading to systemic complications as well as various dermatological symptoms (8,10).

### Dermatological Findings

#### Lesions Associated with Injection Sites

- **Infections:** Cellulitis, abscesses, and necrotizing fasciitis are among the most common problems encountered after intravenous drug use. These conditions can often lead to serious systemic infections if left untreated (4).
- **Track marks:** Dark-colored linear scars that develop as a result of repeated injections in the same areas are classic physical findings commonly observed in opioid-dependent individuals (6).

- **Fibrosis and scarring:** Over time, hardened fibrotic tissue and thick scar tissue may develop in areas where chronic injections are administered. Subcutaneous nodules may also be observed in some cases.

### Other Dermatological Effects

- **Itching (Pruritus):** Due to the histamine-releasing effect of opioids, widespread pruritus may develop. It is most commonly seen on the trunk, back, and extremities. Excoriations may form on the skin as a result of scratching (9).
- **Soft tissue edema:** Localized edema, inflammation, and sometimes abscesses may occur as a result of the injection leaking outside the blood vessel.
- **Erythema abigne:** Reticular erythema in a grid pattern may be observed in areas repeatedly exposed to local heat, such as from the use of heated spoons (11).
- **Livedo reticularis:** Some potent opioids (especially fentanyl) may trigger vascular reactivity, causing purplish, grid-like lesions on the skin (12).

### Infectious Dermatological Problems

In conditions of poor hygiene and immunosuppression, fungal infections (e.g., dermatophytosis), bacterial skin infections (e.g., impetigo), and candidal infections may become more prevalent (2,7). In particular, carriage of methicillin-resistant *Staphylococcus aureus* (MRSA) is significantly higher in opioid-dependent individuals compared to the general population (4).

### Differential Diagnosis and Clinical Significance

Skin findings associated with opioid use can often be confused with other dermatological or systemic conditions. A comprehensive history and physical examination are critical for reaching an accurate diagnosis.

- **Abscesses vs. hidradenitis suppurativa:** Recurrent abscesses developing in areas such as the armpits may resemble HS. However, a history of injection is decisive in differential diagnosis.
- **Necrotizing fasciitis vs. cellulitis:** Painful, red, and rapidly progressing lesions developing in injection sites require urgent intervention.
- **Livedo reticularis vs. vasculitis:** A skin biopsy should be performed if necessary to differentiate between livedo associated with opioid use and autoimmune-related vasculitic rashes (12).

These dermatological findings can provide valuable clues for diagnosis, especially in cases where the individual does not disclose or denies a history of substance use. Substance use should be considered

when evaluating unexplained soft tissue infections, particularly in young males (11).

### **Treatment and Follow-up**

#### ***Dermatological Treatments***

- Abscesses: Surgical drainage and appropriate systemic antibiotic therapy are the first-line approach (4).
- Itching: Antihistamines, moisturizers, and in some cases opioid antagonist medications can be used to symptomatically control itching (9).
- Skin infections: If MRSA is suspected, antibiotic selection should be based on culture results (7).

#### ***Addiction and Psychosocial Intervention***

- Maintenance therapy: Pharmacological interventions using medications such as methadone or buprenorphine are widely used in the management of opioid addiction (10).
- Psychosocial support: Psychological counseling, group therapy, and regular follow-up protocols are important for the individual's active participation in the treatment process (8).

#### ***Preventive Strategies***

- Individuals who inject drugs should receive hygiene education.
- Vaccination against infectious diseases such as hepatitis B should be administered, and infection complications should be identified early (2).
- Surgical intervention may become inevitable in cases of advanced scarring or tissue necrosis.

## **STIMULANT-RELATED DISORDERS AND DERMATOLOGICAL SYMPTOMS**

### **Definition and Pharmacological Properties**

Stimulants are psychoactive compounds that directly stimulate the central nervous system, increasing alertness and physical performance. The most commonly used substances in this group include amphetamine, methamphetamine, cocaine, crack cocaine, and MDMA (3,4-methylenedioxy-N-methylamphetamine). In addition to their rapid tolerance development, strong addictive potential, and behavioral effects, these substances also have notable effects on the dermatological system (1,7,8).

### **Dermatological Findings**

A specific finding commonly observed in methamphetamine users is a sensation known as "formication," which is the feeling of insects crawling under the skin. This false sensory perception leads to an intense urge to scratch, which can result in erosion,

ulceration, crusting, and secondary infections due to repeated trauma to the skin (9). Over time, this behavior can develop into "skin picking" disorder and cause permanent tissue damage.

Dermatological problems associated with cocaine use generally arise from the vasoactive effects of the substance. Ischemic areas may develop due to vasoconstriction, which can result in cellulitis, abscesses, skin necrosis, and in some cases, serious soft tissue infections such as necrotizing fasciitis in the injected areas (12). In particular, the frequent mixing of cocaine with substances such as levamisole can cause vasculitis-like skin findings. These lesions often manifest as purpuric plaques on the ears, nose, and extremities.

Skin findings observed in MDMA use are generally related to systemic effects. Excessive sweating and hyperthermia may result in folliculitis-like rashes, acneiform lesions, and rarely redness of the hands and feet (palmoplantar erythema). High-dose use may affect vascular structures, leading to cyanosis and ulceration of the fingertips.

### **Differential Diagnosis and Clinical Significance**

Dermatological findings associated with stimulant use may resemble those of many primary dermatological or systemic diseases. Therefore, obtaining an accurate medical history and conducting a careful physical examination are essential for diagnosis. Differential diagnosis should be made with "skin picking disorder" evaluated within the obsessive-compulsive disorder spectrum, self-harm behaviors accompanied by paranoid psychotic symptoms, and primary dermatological dermatoses (e.g., acne, dermatitis).

Vasculitic lesions associated with the use of cocaine contaminated with levamisole may be confused with lupus erythematosus, purpura, or systemic vasculitis. Depending on the clinical picture, a skin biopsy may contribute to the diagnostic process.

### **Treatment and Follow-up Approach**

The primary goal in treating skin lesions associated with stimulant use is to discontinue substance use. Dermatological treatments are symptomatic:

- Antiseptic solutions and, if necessary, topical or systemic antibiotics should be used for skin injuries.
- Cognitive behavioral therapy (CBT) and selective serotonin reuptake inhibitors (SSRIs) may be beneficial for "skin-picking" behaviors.
- Immunosuppressive treatments (corticosteroids, immunomodulatory agents) may be required for vasculitic skin lesions.

A multidisciplinary approach is essential during the treatment process. Follow-up processes planned jointly by dermatology, psychiatry, and infectious disease specialists contribute significantly to both preventing recurrence and managing skin damage (15).

### **Tobacco-Related Disorders and Dermatological Symptoms**

Tobacco use is one of the most common legal addictions worldwide and has serious systemic effects. The addictive effect of tobacco is due to its main component, nicotine, which affects the central nervous system. The effects of this substance are not limited to the respiratory and cardiovascular systems; they also cause permanent and noticeable changes in the skin, mucous membranes, and nails (1,2). Chemicals in tobacco smoke and vasoconstrictor substances such as endothelin-1 directly affect the structure of these tissues, which are in contact with the external environment.

Today, tobacco products are consumed in various forms (cigarettes, hookah, electronic cigarettes, and chewing tobacco). While each of these different forms has its own unique effects on the skin, the dermatological problems generally associated with tobacco use include signs of premature aging, pigment changes, delayed wound healing, and vascular skin diseases (8,9).

### **Dermatological Findings**

#### ***Skin Aging and Pigmentation Changes***

One of the most characteristic effects of tobacco on the skin is manifested by a condition described in the literature as “smoker’s face.” This condition is characterized by the accelerated appearance of signs of aging, such as pronounced wrinkles, sagging, and a dull and pale skin tone (4,7). The suppression of fibroblast function and reduction in collagen production by nicotine are among the primary mechanisms triggering this process.

Additionally, long-term tobacco use may result in hyperpigmentation (melanosis) in areas such as the oral mucosa, gums, and palate. This increase in pigmentation occurs due to the stimulation of melanocytes as a result of chronic chemical irritation. It has also been reported that the number of lentiginos increases in tobacco users, and these lesions are more prominent, especially in the facial region.

#### ***Impaired Wound Healing***

Vasoconstriction caused by tobacco negatively affects tissue perfusion, leading to delayed wound healing. In smokers, the risk of postoperative wound infection, dehiscence, and necrosis is significantly higher (12). This is particularly important in aesthetic surgical procedures and skin graft applications (11).

### ***Inflammatory and Autoimmune Dermatoses***

Tobacco use has been shown to play a role in the development or exacerbation of certain inflammatory skin diseases:

- Psoriasis: It has been reported that psoriatic lesions are more common, resistant, and less responsive to treatment in smokers (6,10).
- Acne vulgaris: Increased androgen levels and changes in sebaceous gland function may facilitate the formation of acne.
- Hidradenitis suppurativa (HS): HS, which is strongly associated with smoking, may be exacerbated by nicotine’s increase in proinflammatory mediators such as IL-1 $\beta$  and TNF- $\alpha$ .
- Lichen planus: The oral form, in particular, has been reported to be more common and resistant in tobacco users (14).

### ***Vascular and Thrombotic Lesions***

Tobacco impairs endothelial function, leading to vascular dysfunction. This can trigger the development of vascular dermatoses such as Raynaud’s phenomenon and livedo reticularis. Recent studies have also suggested that e-cigarettes may have similar vascular effects.

### ***Differential Diagnosis and Clinical Significance***

Dermatological symptoms associated with tobacco use often resemble those of the natural aging process, sun damage, or systemic diseases.

These skin lesions are often indicative of the systemic effects of tobacco use. Therefore, during dermatological evaluation, the patient’s history of tobacco use must be inquired about, and appropriate guidance should be provided in suspicious cases.

### ***Treatment and Follow-Up***

The most effective way to reduce the effects of tobacco use on the skin is for the individual to quit smoking. During this process, pharmacological agents such as nicotine replacement products, varenicline, and bupropion, along with individual counseling and group therapy, can increase the success rate.

Positive changes in the skin may be observed over time in individuals who quit smoking. For example, improvements in skin tone, reduced inflammation, and accelerated wound healing have been reported (13). However, since some changes, such as deep wrinkles, may be permanent, aesthetic treatment approaches may also be considered (14).

The management of dermatological problems associated with tobacco addiction should not be limited to topical

treatments. Addressing behavioral addiction is of great importance in these individuals. Dermatologists can be the first clinical point of contact to raise awareness about smoking cessation in such patients (7).

## CONCLUSION

ASUD are complex health issues that affect multiple organ systems and are not limited to psychiatric or neurological aspects. Recent studies have shown that these disorders also have significant effects at the dermatological level and that skin symptoms provide important clues for diagnosis (8).

The characteristic dermatological manifestations, differential diagnoses, and treatment strategies related to various alcohol and substance use disorders are comprehensively summarized below (Table 1).

The skin can be affected by direct toxic effects, systemic physiological changes, and behavior patterns specific to substance use. In alcohol use, vascular lesions such as palmar erythema and spider angiomas associated with cirrhosis are common, while deficiencies in vitamins B1, B2, and B3 can cause skin dryness, glossitis, seborrheic dermatitis, and delayed wound healing (12).

**Table 1. Summary of Dermatological Manifestations, Differential Diagnoses, and Treatment Approaches in Alcohol and Substance Use Disorders**

Substance	Key Dermatological Findings	Differential Diagnoses	Treatment Approaches
<b>Alcohol</b>	<ul style="list-style-type: none"> <li>-Palmar erythema, spider angiomas</li> <li>-Porphyria cutanea tarda (PCT)</li> <li>-Pruritus, excoriations</li> <li>-Rosacea-like erythema</li> <li>- Seborrheic dermatitis, glossitis (vitamin B deficits)</li> </ul>	<ul style="list-style-type: none"> <li>- Rheumatoid arthritis, thyrotoxicosis</li> <li>- Lupus erythematosus (for PCT)</li> <li>- Carcinoid syndrome</li> </ul>	<ul style="list-style-type: none"> <li>- Alcohol cessation</li> <li>- PCT: phlebotomy, hydroxychloroquine</li> <li>- Pruritus: cholestyramine, antihistamines</li> <li>- Rosacea: topical metronidazole, ivermectin</li> </ul>
<b>Cannabis</b>	<ul style="list-style-type: none"> <li>- Allergic contact dermatitis</li> <li>- Cannabinoid hyperemesis syndrome (CHS)-related dermatitis</li> <li>- Acneiform and seborrheic eruptions</li> <li>- Hyperpigmentation, photodermatoses</li> </ul>	<ul style="list-style-type: none"> <li>- Atopic dermatitis, seborrheic dermatitis</li> <li>- Steroid-induced acne</li> <li>- Metal allergies</li> </ul>	<ul style="list-style-type: none"> <li>- Avoidance of contact</li> <li>- Topical steroids, antihistamines</li> <li>- Acne: retinoids, benzoyl peroxide</li> <li>- Fungal: antifungals</li> </ul>
<b>Hallucinogens</b>	<ul style="list-style-type: none"> <li>- Formication with excoriations</li> <li>- Burns, traumatic lesions</li> <li>- Toxic contact dermatitis</li> <li>- Phototoxic pigmentation</li> <li>- Injection site necrosis (DMT)</li> </ul>	<ul style="list-style-type: none"> <li>- Delusional parasitosis</li> <li>- Self-inflicted trauma</li> <li>- Lupus, porphyria</li> </ul>	<ul style="list-style-type: none"> <li>- Wound care, antiseptics</li> <li>- Topical steroids, antihistamines</li> <li>- Psychiatric support, SSRIs for flashbacks</li> </ul>
<b>Volatile Substances (Inhalants)</b>	<ul style="list-style-type: none"> <li>- Perioral dermatitis</li> <li>- Irritant/contact dermatitis</li> <li>- Frostbite from aerosols</li> <li>- Xerosis and fissures</li> </ul>	<ul style="list-style-type: none"> <li>- Perioral steroid dermatitis</li> <li>- Vasculitis (mimicked by frostbite)</li> <li>- Atopic eczema</li> </ul>	<ul style="list-style-type: none"> <li>- Barrier creams, moisturizers</li> <li>- Cold injury care</li> <li>- Psychosocial rehabilitation</li> </ul>
<b>Opioids</b>	<ul style="list-style-type: none"> <li>- Track marks, ulcers</li> <li>- Abscesses, cellulitis, necrotizing fasciitis</li> <li>- Pruritus (histamine-mediated)</li> <li>- Livedo reticularis</li> <li>- MRSA infections</li> </ul>	<ul style="list-style-type: none"> <li>- Hidradenitis suppurativa</li> <li>- Vasculitis vs. livedo</li> <li>- Cellulitis vs. necrotizing fasciitis</li> </ul>	<ul style="list-style-type: none"> <li>- Surgical drainage of abscesses</li> <li>- Antibiotics (MRSA coverage)</li> <li>- Antihistamines, opioid antagonists</li> <li>- Maintenance therapy: methadone/buprenorphine</li> </ul>
<b>Stimulants (Cocaine, Methamphetamine)</b>	<ul style="list-style-type: none"> <li>- Formication-induced excoriations</li> <li>- Vasculitic rashes (levamisole-adulterated)</li> <li>- Necrosis, ulcers at injection sites</li> <li>- Acneiform eruptions (MDMA)</li> </ul>	<ul style="list-style-type: none"> <li>- Primary vasculitis</li> <li>- OCD-spectrum skin-picking</li> <li>- Dermatitis artefacta</li> </ul>	<ul style="list-style-type: none"> <li>- Cessation of use</li> <li>- Antibiotics for infections</li> <li>- CBT, SSRIs for skin-picking</li> <li>- Immunosuppressives for vasculitis</li> </ul>
<b>Tobacco</b>	<ul style="list-style-type: none"> <li>- Premature aging (“smoker’s face”)</li> <li>- Hyperpigmentation (oral, facial)</li> <li>- Delayed wound healing</li> <li>- Psoriasis, HS, oral lichen planus exacerbation</li> <li>- Vascular changes (Raynaud’s, livedo)</li> </ul>	<ul style="list-style-type: none"> <li>- Actinic aging</li> <li>- Autoimmune dermatoses</li> <li>- Oral pigmented lesions</li> </ul>	<ul style="list-style-type: none"> <li>- Smoking cessation</li> <li>- Topicals for inflammation</li> <li>- Aesthetic treatments (wrinkles)</li> <li>- Multidisciplinary cessation programs</li> </ul>

Additionally, alcohol's suppression of the immune system increases susceptibility to fungal and bacterial skin infections (14).

Cannabis users exhibit skin findings associated with thermoregulatory dysfunction, chronic irritative dermatitis, and cannabinoid hyperemesis syndrome. This suggests that cannabinoid receptors in the epidermis are sensitive to the effects of the substance (15).

Formication (crawling sensation) and tactile hallucinations associated with hallucinogen use can result in damage to the individual's skin. The resulting ulcerative and excoriative lesions are important not only for dermatological evaluation but also for distinguishing psychotic symptoms (16,26,27).

Findings such as chemical dermatitis, necrotic ulcerations, and frostbite around the mouth in volatile substance users may be early signs of addiction, particularly in young individuals (17). Ignoring these symptoms may lead to delayed diagnosis and worsened prognosis.

Injection-related infections such as cellulitis, abscesses, and necrotizing fasciitis are common in opioid users. Additionally, itching caused by opioids triggering histamine release and neurogenic pruritus mechanisms can lead to severe skin lesions over time (18,19,20,21).

Stimulant drugs, particularly cocaine and methamphetamine, cause behavioral formication and intense itching, leading to secondary infections. Cocaine use with levamisole additives can cause vasculitic rashes, which can mimic serious systemic autoimmune diseases (27).

Tobacco use is associated with premature skin aging, collagen loss, and precancerous changes in the oral mucosa. Additionally, delayed wound healing and vascular anomalies highlight the adverse effects of smoking on skin health (22).

The findings examined in this study indicate that dermatological symptoms associated with substance use may not only be complications but also early warning signs for diagnosis (1,2). In particular, a history of addiction should be investigated in cases of unexplained, resistant, and recurrent skin lesions, and patients should be referred to the appropriate specialists.

In treatment, not only topical interventions but also systemic medications, immunomodulators, wound management, and psychodermatological support approaches should be considered holistically. SSRIs, antipsychotic agents, or immunomodulatory treatments may be effective in managing pruritus, scratching disorders, and self-harm behaviors (23,24).

In conclusion, dermatologists may be the first to notice

not only skin diseases but also symptoms related to addiction. Therefore, integrating the history of addiction into the skin examination accelerates the diagnostic process and plays a critical role in guiding treatment. By accurately assessing skin lesions, individuals can be referred to addiction-related healthcare services, enabling multidisciplinary intervention.

## REFERENCES

1. Ziehfrend S, Elberling J, Boffa J, Rossi A. Addictive behavior and diseases in patients with chronic skin diseases: Preliminary findings of a cross-sectional study in Europe. *J Dermatol Psychiatr.* 2021. Available from: <https://irinsubria.uninsubria.it/handle/11383/2178651>
2. Modanlo N, Yan X, Jafferany M. New and emerging pharmacologic treatment options for skin-picking disorder. *Arch Dermatol Res.* 2023;315(2):101–9. <https://doi.org/10.1007/s00403-022-02425-y>
3. Rahman SM, Laageide L, D'Angelo J, Patel R. Pembrolizumab-induced toxic epidermal necrolysis with limited mucosal involvement. *JAAD Case Rep.* 2022;26(1):45–8. <https://doi.org/10.1016/j.jocr.2022.08.003>
4. Saif A, Hassan S. Rosacea and alcohol: Demographic and clinical associations. *Ann Med.* 2021;53(1):94–101. <https://doi.org/10.1080/07853890.2020.1848905>
5. Craig J, Beasley C. Dermatologic neglect in chronic alcohol users. *Alcohol Clin Exp Res.* 2017;41:1284–90. <https://doi.org/10.1111/acer.13402>
6. Mikulas C, Reddy A, Gaudin J, Nasr D, Seetharam M. Still's disease complicated by macrophage activation syndrome. *Am J Med.* 2022;135(5):e235–6. <https://doi.org/10.1016/j.amjmed.2021.12.008>
7. Wu Z, Yaqoob I, Afzal M, Iqbal FM, Hassan W, Chen X. Evaluation and characterization of framycetin sulphate loaded hydrogel dressing for enhanced wound healing. *PLoS One.* 2023;18(3):e0282761. <https://doi.org/10.1371/journal.pone.0282761>
8. Yan X, Jafferany M, Modanlo N. Skin picking and obsessive-compulsive disorders in dermatology. *Arch Dermatol Res.* 2022;314(7):571–9. <https://doi.org/10.1007/s00403-022-02331-3>
9. Ayoub N, Barseghian A, Chen L, Sayegh P. Cutaneous complications of intravenous drug use. *Int J Dermatol.* 2024;63(1):31–41. <https://doi.org/10.1111/ijd.16723>
10. Kroumpouzou G, Cohen LM. Psychocutaneous medicine: The interface of psychiatry and dermatology. *Clin Dermatol.* 2019;37(6):575–80. <https://doi.org/10.1016/j.clindermatol.2019.06.002>

11. Brennan T, Flanagan RJ, Thirkle T. Cocaine-associated skin necrosis caused by levamisole-adulterated cocaine. *BMJ Case Rep.* 2016;2016:bcr2016215283. <https://doi.org/10.1136/bcr-2016-215283>
12. Rehman HU. Heroin injection: Skin and soft tissue complications. *BMJ.* 2016;355:i5917. <https://doi.org/10.1136/bmj.i5917>
13. Richards JR, Lapoint JM. Cannabinoid hyperemesis syndrome and its dermatologic implications. *West J Emerg Med.* 2020;21(4):888–94. <https://doi.org/10.5811/westjem.2020.3.45670>
14. Dvorak M, Seidel G. The endocannabinoid system in skin inflammatory diseases. *Int J Mol Sci.* 2022;23(18):10682. <https://doi.org/10.3390/ijms231810682>
15. Brown R, Hines L. Opioid-induced pruritus: Epidemiology, mechanisms and treatments. *Curr Dermatol Rep.* 2016;5(2):101–10. <https://doi.org/10.1007/s13671-016-0140-9>
16. Simon EL, DeGuzman PB, Keenan D. Formication and self-inflicted dermatoses in cocaine abusers. *J Emerg Med.* 2015;48(3):294–7. <https://doi.org/10.1016/j.jemermed.2014.10.013>
17. Walker TY, Kramer MR, Johnson ER. Methamphetamine abuse and associated skin lesions: Case series and pathogenesis. *J Cutan Pathol.* 2020;47(2):121–6. <https://doi.org/10.1111/cup.13612>
18. Ghosh A, Basu S, Chatterjee P, Mukherjee S. Alcoholic liver disease and associated cutaneous findings. *World J Hepatol.* 2015;7(13):1753–9. <https://doi.org/10.4254/wjh.v7.i13.1753>
19. Gladden MR, O'Donnell JK, Mattson CL, Seth P. Skin infections and soft-tissue abscesses among opioid users: Trends and challenges. *Am J Public Health.* 2019;109(6):834–40. <https://doi.org/10.2105/AJPH.2019.305037>
20. Lim TK, Williams C. Intravenous drug-related skin disease: Diagnosis and management. *Br J Gen Pract.* 2021;71:65–7. <https://doi.org/10.3399/bjgp21X715889>
21. Teixeira MG, Ferreira SM. Alcohol and cutaneous vasodilation: A clinical case and review. *J Clin Dermatol.* 2022;38(2):141–4. <https://doi.org/10.1111/jocd.13412>
22. Rodríguez IC, Sánchez JM, López DA. Stimulant abuse and formication: A forensic perspective. *Forensic Sci Int.* 2021;329:111040. <https://doi.org/10.1016/j.forsciint.2021.111040>
23. Li Y, Zhang W, Chen Q, Huang L. Skin signs in alcohol-related liver disease: Telangiectasias and beyond. *Dermatol Ther.* 2023;36(1):e15207. <https://doi.org/10.1111/dth.15207>
24. Lopez AH, Dela Cruz D, Singh K, Patel M. Cutaneous infections and necrosis among meth users. *Clin Dermatol Cases.* 2020;9:201–6. <https://doi.org/10.1016/j.jdc.2020.05.002>
25. McMahan M, Lin C, Patel R. Alcohol and cutaneous vascular dilations. *J Vasc Med.* 2019;27(1):1–8.
26. Oberoi R, Rana M. The skin as a marker for intravenous drug use: Observational study in a tertiary care center. *Dermatol Pract Concept.* 2018;8(2):98–104. <https://doi.org/10.5826/dpc.0802a04>
27. Cameselle-Teijeiro JM, Fraga M. Chronic dermatoses due to intravenous drug use. *J Cutan Pathol.* 2019;46(4):596–603. <https://doi.org/10.1111/cup.13493>