

Consumer Misuse of Cosmeceuticals and Its Role in Adverse Skin Reactions

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Abstract

Cosmeceuticals represent a rapidly expanding category of products positioned between cosmetics and pharmaceuticals, offering both aesthetic and therapeutic benefits. However, their widespread availability, aggressive marketing, and perception as inherently safe have contributed to increasing instances of consumer misuse. Misuse includes over-application, inappropriate combinations, prolonged unsupervised use, and use of high-potency active ingredients without dermatological guidance. Such practices have been strongly associated with a broad spectrum of adverse cutaneous reactions ranging from mild irritation to severe dermatological conditions such as steroid-induced dermatitis, exogenous ochronosis, and contact dermatitis. Recent literature highlights that commonly used ingredients, such as hydroquinone, retinoids, alpha-hydroxy acids (AHAs), and topical corticosteroids, are frequently implicated in adverse outcomes when misused. The growing trend of self-medication, especially in skin-lightening and anti-aging regimens, exacerbates the risk. Furthermore, sociocultural influences, including beauty standards and digital media promotion, play a significant role in shaping unsafe consumer behavior. This review critically examines patterns of cosmeceutical misuse, identifies high-risk ingredients, and explores the mechanisms underlying adverse skin reactions. It also discusses regulatory challenges and proposes preventive strategies aimed at improving consumer awareness and dermatological safety. Understanding these factors is essential for healthcare professionals, pharmacists, and regulatory authorities to mitigate risks and promote rational cosmeceutical use.

Keywords: Cosmeceuticals, misuse, adverse skin reactions, hydroquinone, retinoids, topical steroids, dermatotoxicity, skin irritation, consumer behavior, cosmetovigilance

INTRODUCTION

Cosmeceuticals are a hybrid class of topical formulations that combine cosmetic appeal with biologically active ingredients intended to exert therapeutic effects on the skin. Although the term lacks formal regulatory recognition in many jurisdictions, cosmeceuticals are widely accepted in dermatological practice and consumer markets due to their perceived efficacy in treating conditions such as hyperpigmentation, acne, photoaging, and uneven skin tone (Couteau & Coiffard, 2016).

Over the past two decades, the global cosmeceutical market has experienced exponential growth driven by increased consumer awareness, technological advancements in formulation science, and the influence of social media. Products containing active agents, such as retinoids, hydroquinone, peptides, antioxidants, and exfoliating acids, are now readily available over the counter. While these agents offer significant dermatological benefits under controlled use; their misuse has emerged as a critical public health concern [1].

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CONCEPT OF MISUSE IN COSMECEUTICALS

Consumer misuse refers to the inappropriate, excessive, or unsupervised use of cosmeceutical products, often without adequate knowledge of their pharmacological effects. Unlike prescription drugs, many cosmeceuticals are easily accessible, leading consumers to self-diagnose and self-treat skin conditions. Misuse may include:

- Excessive frequency or dosage.
- Use of multiple active agents simultaneously (polypharmacy effect).
- Long-term use of potent ingredients.
- Application on unsuitable skin types.
- Ignoring contraindications or safety guidelines.

Studies have shown that such practices significantly increase the risk of adverse cutaneous reactions (Rathi & D'Souza, 2017) [2].

Growing Burden of Adverse Skin Reactions

Adverse skin reactions associated with cosmeceutical misuse have been increasingly reported in dermatological settings worldwide. These reactions range from mild erythema and dryness to severe conditions, such as:

- Steroid-induced rosacea.
- Exogenous ochronosis from hydroquinone misuse.
- Irritant and allergic contact dermatitis.
- Photosensitivity and chemical burns.

For instance, prolonged use of hydroquinone-containing products has been linked to irreversible pigmentation disorders, while misuse of topical corticosteroids in fairness creams has led to steroid-dependent dermatitis (Nnoruka & Okoye, 2006). Similarly, improper use of retinoids may cause skin barrier disruption and increased sensitivity (Desai, 2014) [3].

Mechanisms Underlying Adverse Effects

The pathophysiology of adverse skin reactions due to cosmeceutical misuse is multifactorial and depends on:

- Concentration and potency of active ingredients.
- Duration of exposure.
- Skin type and genetic predisposition.
- Environmental factors such as UV exposure.

For example, excessive exfoliation using AHAs can disrupt the stratum corneum, leading to increased transepidermal water loss and irritation. Similarly, chronic corticosteroid use suppresses collagen synthesis, resulting in skin atrophy [4].

Importance of Cosmetovigilance

The concept of cosmetovigilance has emerged as a critical framework for monitoring adverse effects associated with cosmetic and cosmeceutical products. Unlike pharmacovigilance, cosmetovigilance remains underdeveloped in many regions, contributing to underreporting of adverse reactions.

Healthcare professionals, especially pharmacists and dermatologists, play a vital role in identifying misuse patterns and educating consumers (Table 1). Strengthening regulatory policies and improving labeling standards are essential to ensure safe usage (Figure 1).

Table 1. Difference between proper use and misuse of cosmeceuticals.

Parameter	Proper use	Misuse
Dosage	Recommended amount	Excessive or frequent application.
Duration	Limited, monitored use	Prolonged unsupervised use.
Guidance	Dermatologist/pharmacist guided	Self-prescribed.
Combination	Evidence-based combinations	Random mixing of products.
Safety	Minimal side effects	High risk of adverse reactions.

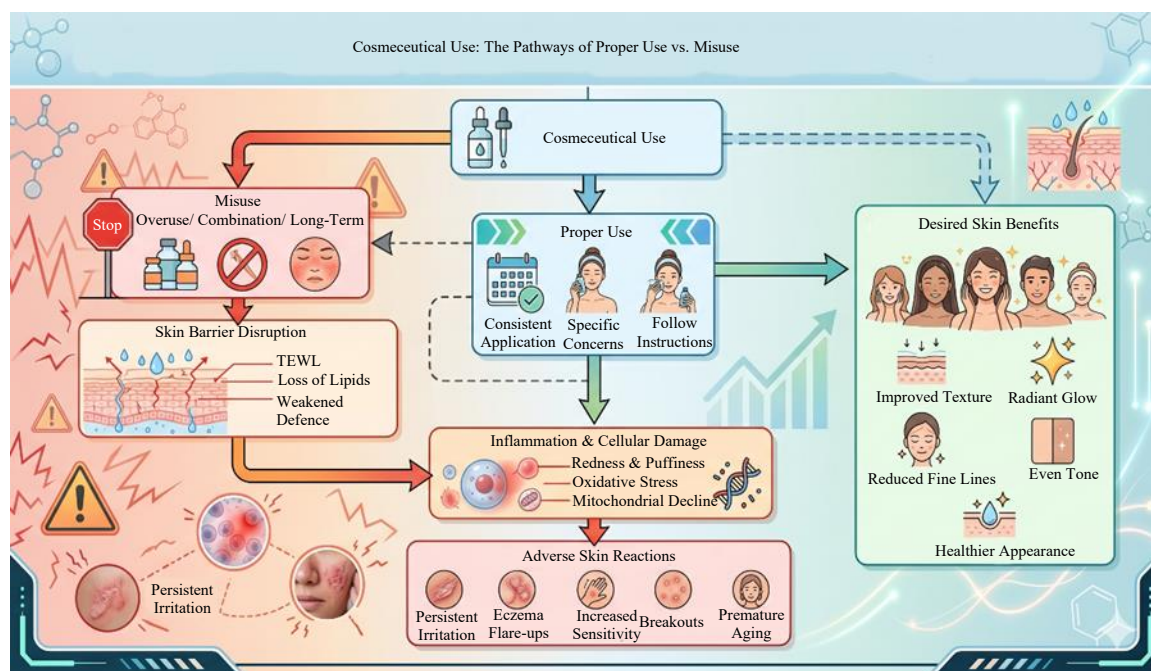


Figure 1. Conceptual relationship between cosmeceutical use and adverse skin reactions.

Rationale of the Review

Despite increasing reports of adverse reactions, there remains a lack of comprehensive reviews focusing specifically on consumer misuse of cosmeceuticals. Most available literature addresses individual ingredients or specific dermatological conditions rather than the broader behavioral and regulatory aspects.

This review aims to bridge that gap by providing an integrated analysis of:

- Misuse patterns.
- High-risk ingredients.
- Types of adverse reactions.
- Sociocultural drivers.
- Preventive strategies.

Such an approach is essential for developing safer cosmeceutical practices and improving patient outcomes [5].

PATTERNS OF CONSUMER MISUSE

The misuse of cosmeceuticals has evolved into a significant dermatological concern, characterized by distinct and recurring behavioral patterns across different populations. These patterns are influenced by accessibility, marketing strategies, sociocultural beliefs, and lack of regulatory enforcement. Unlike prescription medications, cosmeceuticals are often perceived as safe, leading to irrational usage practices that predispose individuals to adverse skin reactions.

A synthesis of current literature indicates that misuse is not random but follows identifiable trends such as self-medication, prolonged use, product layering, and off-label applications. These behaviors are frequently observed in dermatology clinics, particularly among individuals seeking rapid cosmetic results (*Besra et al., 2023*) [6].

Self-Medication and Over-the-Counter (OTC) Misuse

One of the most prevalent patterns is self-medication, where consumers independently select and use cosmeceuticals without professional guidance. The widespread availability of OTC products containing active pharmacological agents, such as retinoids, hydroquinone, and corticosteroids, contributes significantly to this issue.

Studies have shown that a substantial proportion of individuals use topical corticosteroids and fairness creams without prescriptions. In a clinical study, approximately 58.7% of patients reported using topical corticosteroids for cosmetic purposes, particularly for skin lightening (*Chohan et al., 2014*). Similarly, OTC usage studies reveal that consumers often rely on peer recommendations, online influencers, or advertisements rather than dermatological advice (*Bhatnagar et al., 2024*).

Self-medication increases the risk of inappropriate dosing, incorrect indications, and delayed diagnosis of underlying skin conditions [7].

Polypharmacy and Product Layering (“Cosmetic Cocktailing”)

Another critical misuse pattern is the simultaneous use of multiple cosmeceutical products, often referred to as cosmetic polypharmacy or product layering. Consumers frequently combine:

- Retinoids.
- Alpha-hydroxy acids (AHAs).
- Vitamin C serums.
- Hydroquinone.
- Topical steroids.

without understanding their synergistic or antagonistic interactions.

This practice can lead to cumulative irritation, disruption of the skin barrier, and increased penetration of active agents, thereby amplifying toxicity. For example, combining exfoliating acids with retinoids can significantly increase skin sensitivity and inflammation.

Prolonged and Unsupervised Use

Long-term use of cosmeceuticals, particularly those containing potent active ingredients, is another common misuse pattern. Consumers often continue using products beyond recommended durations in pursuit of sustained or enhanced cosmetic effects.

Chronic use of topical corticosteroids for skin lightening has been widely documented. Such prolonged exposure leads to conditions, like:

- Steroid-dependent dermatitis.
- Skin atrophy.
- Telangiectasia.

Clinical epidemiological studies confirm that prolonged misuse is a major contributor to adverse dermatological outcomes (*Meena et al., 2026*) [8].

Use for Non-Indicated Conditions

Cosmeceuticals are frequently used for off-label or inappropriate indications, driven by misinformation and unrealistic expectations. Common examples include:

- Using anti-acne products for general skin brightening.
- Applying hydroquinone on normal skin without hyperpigmentation.
- Using steroid creams for fairness or instant glow.

Such practices not only lack therapeutic justification but also increase the likelihood of adverse reactions.

Influence of Skin Lightening Practices

Skin lightening or “fairness” practices represent a major domain of cosmeceutical misuse globally. These practices are particularly prevalent in parts of Asia, Africa, and the Middle East, where lighter skin tones are often socially preferred.

Consumers frequently use combinations of:

- Hydroquinone.
- Topical corticosteroids.
- Retinoids.

Often in high concentrations and without supervision. This combination, sometimes referred to as modified “Kligman’s formula,” is widely misused outside clinical settings (*Shivakumar & Jafferany, 2020*).

Such misuse is strongly associated with severe adverse effects, including exogenous ochronosis and steroid-induced dermatoses [9].

Digital and Social Media-Driven Misuse

The rise of digital platforms has significantly altered consumer behavior. Social media influencers, beauty bloggers, and online advertisements often promote cosmeceuticals without scientific validation. This has led to:

- Blind adoption of trending skincare routines.
- Use of unverified product combinations.
- Overuse of “active” ingredients.

These trends contribute to a phenomenon known as “DIY dermatology”, where individuals experiment with potent formulations without understanding their pharmacodynamics.

Demographic Trends in Misuse

Misuse patterns vary across demographic groups:

- *Adolescents and Young Adults*: More prone to acne-related product misuse and social media influence.
- *Women*: Higher prevalence of skin-lightening product misuse.
- *Urban Populations*: Greater exposure to marketing and OTC availability.
- *Low-Awareness Groups*: Increased reliance on self-medication.

Epidemiological studies indicate that misuse is not limited to any single group but is widespread across socioeconomic strata (Figure 2).

Clinical Significance of Misuse Patterns

Understanding these patterns is essential for healthcare professionals as they directly influence:

- Diagnosis of adverse skin reactions.
- Treatment planning.
- Patient counseling strategies.

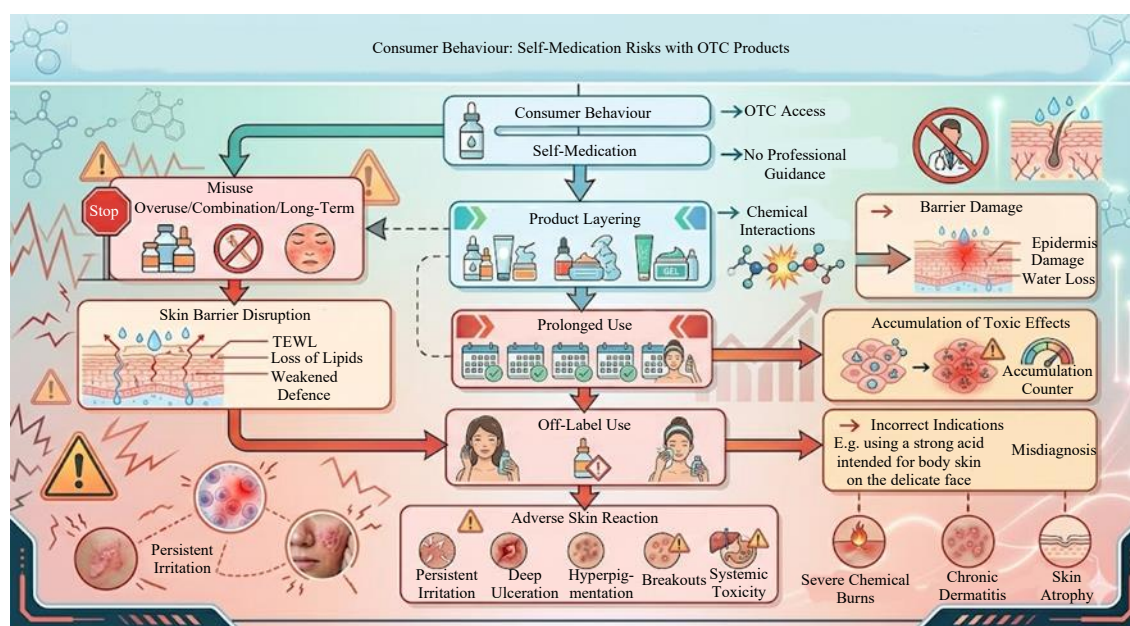


Figure 2. Common patterns of cosmeceutical misuse.

Recognition of misuse behaviors enables dermatologists and pharmacists to implement targeted interventions and reduce the burden of cosmetically induced dermatoses.

COMMONLY MISUSED COSMECEUTICAL INGREDIENTS

Cosmeceuticals contain a wide range of biologically active ingredients that exert pharmacological effects on the skin. While these agents are beneficial when used appropriately, their misuse – particularly in high concentrations, inappropriate combinations, or prolonged durations – can lead to significant dermatological complications. Among these, certain classes of ingredients are repeatedly implicated in adverse skin reactions due to their potency and widespread availability.

A comprehensive review of dermatological literature indicates that hydroquinone, retinoids, alpha-hydroxy acids (AHAs), and topical corticosteroids are the most frequently misused cosmeceutical ingredients (*Desmedt et al., 2016*). These agents act on critical pathways, such as melanogenesis, keratinocyte turnover, and inflammatory modulation, making them both therapeutically valuable and potentially harmful [10].

Hydroquinone

Mechanism of Action

Hydroquinone is a widely used depigmenting agent that inhibits melanin synthesis by blocking the enzyme tyrosinase, thereby reducing melanocyte activity. It is commonly used in the treatment of hyperpigmentation disorders such as melasma and post-inflammatory hyperpigmentation (*Rendon & Gaviria, 2005*).

Patterns of Misuse

- Use in high concentrations (>4%).
- Prolonged application without medical supervision.
- Use on normal skin for cosmetic lightening.
- Combination with steroids and retinoids without guidance.

Adverse Effects

Hydroquinone misuse is associated with both reversible and irreversible skin conditions:

- Exogenous ochronosis (bluish-black pigmentation).

- Skin irritation and erythema.
- Contact dermatitis.
- Paradoxical hyperpigmentation.

Chronic use disrupts melanocyte function and leads to pigment deposition in the dermis, making the condition difficult to treat (*Couteau & Coiffard, 2016*) [11].

Retinoids (Retinol, Tretinoin, Adapalene)

Mechanism of Action

Retinoids are vitamin A derivatives that regulate gene expression through nuclear receptors, promoting:

- Increased cell turnover.
- Collagen synthesis.
- Reduction in fine lines and acne lesions (*Zasada & Budzisz, 2019*).

Patterns of Misuse

- Excessive frequency of application.
- Use in high concentrations without gradual adaptation.
- Combination with exfoliating agents (AHAs/BHAs).
- Use without sun protection.

Adverse Effects

The most common adverse effect is retinoid-induced dermatitis, characterized by:

- Dryness and scaling.
- Erythema and burning sensation.
- Increased photosensitivity.
- Skin barrier disruption.

Improper use can lead to chronic irritation and increased susceptibility to environmental damage (*Draelos, 2007*) [5].

Alpha-Hydroxy Acids (AHAs)

Mechanism of Action

AHAs, such as glycolic acid and lactic acid, function as exfoliating agents by:

- Reducing corneocyte cohesion.
- Promoting desquamation.
- Enhancing skin renewal.

They are commonly used in anti-aging and skin-brightening formulations (*Tung et al., 2000*).

Patterns of Misuse

- Use of high concentrations in home settings.
- Frequent application leading to over-exfoliation.
- Combination with retinoids or other acids.
- Lack of photoprotection.

Adverse Effects

- Chemical burns.
- Skin irritation and redness.
- Increased UV sensitivity.
- Post-inflammatory hyperpigmentation.

The severity of adverse effects is directly related to concentration and exposure duration (*Barote et al., 2022*).

Topical Corticosteroids

Mechanism of Action

Topical corticosteroids exert anti-inflammatory and immunosuppressive effects by inhibiting cytokine production and reducing immune cell activity [2].

Patterns of Misuse

- Use as fairness creams or skin-lightening agents.
- Long-term unsupervised application.
- Use of high-potency steroids on the face.
- Combination with hydroquinone and retinoids.

Adverse Effects

Misuse of corticosteroids leads to severe dermatological conditions:

- Steroid-induced dermatitis.
- Skin atrophy and thinning.
- Telangiectasia.
- Acneiform eruptions.

Chronic misuse may also cause systemic absorption and endocrine disturbances (*Rathi & D'Souza, 2017*) [2].

Other Frequently Misused Ingredients

Kojic Acid

- Used as a depigmenting agent.
- Can cause contact dermatitis and sensitization.

Vitamin C (Ascorbic Acid)

- Generally safe but unstable formulations may cause irritation.

Niacinamide

- Safer alternative but may cause mild irritation at high concentrations.

Beta-Hydroxy Acids (BHAs)

- Overuse leads to dryness and peeling.

Clinical Implications

The misuse of these ingredients often results in overlapping dermatological conditions, making diagnosis and management complex. For instance:

- Combination of hydroquinone and steroids → pigmentary disorders + skin thinning.
- Retinoids + AHAs → severe irritation and barrier damage.

Understanding ingredient-specific toxicity profiles is crucial for clinicians to identify causative agents and implement appropriate treatment strategies.

TYPES OF ADVERSE SKIN REACTIONS

Adverse skin reactions resulting from the misuse of cosmeceuticals represent a diverse spectrum of dermatological conditions. These reactions may be acute or chronic, localized or widespread, and range from mild irritation to severe, irreversible dermatoses. The clinical manifestation depends on several factors including the nature of the active ingredient, duration of exposure, individual skin sensitivity, and environmental influences.

A consolidated review of dermatological literature reveals that the most common adverse reactions include irritant contact dermatitis, allergic contact dermatitis, photosensitivity reactions, steroid-induced dermatoses, pigmentary disorders, and acneiform eruptions (*Zirwas, 2019; Li & Li, 2021*) [11, 8]. These reactions often overlap, complicating diagnosis and management [7, 8].

Irritant Contact Dermatitis (ICD)

Definition and Mechanism

Irritant contact dermatitis is a non-immunological inflammatory reaction caused by direct damage to the skin barrier following exposure to irritants. It is the most frequently reported adverse effect associated with cosmeceutical misuse.

Mechanistically, irritants, such as AHAs, retinoids, and hydroquinone, disrupt the stratum corneum, leading to:

- Increased transepidermal water loss (TEWL).
- Keratinocyte damage.
- Release of inflammatory mediators.

Clinical Features

- Erythema.
- Burning sensation.
- Dryness and scaling.
- Skin tightness.

ICD typically appears shortly after exposure and is dose-dependent (*Ladizinski et al., 2011*) [7].

Allergic Contact Dermatitis (ACD)

Definition and Mechanism

Allergic contact dermatitis is a Type IV delayed hypersensitivity reaction mediated by T-lymphocytes. It occurs when the immune system becomes sensitized to a specific ingredient such as fragrances, preservatives, or active cosmeceuticals.

Clinical Features

- Intense itching.
- Vesicles and papules.
- Oozing lesions.
- Chronic lichenification.

Unlike ICD, ACD requires prior sensitization and may occur even with minimal exposure (*Rozas-Muñoz & Game, 2020*).

Photosensitivity Reactions

Types

- Phototoxic reactions (direct tissue damage).
- Photoallergic reactions (immune-mediated).

Causes

Cosmeceuticals containing retinoids, AHAs, and certain botanical extracts increase skin sensitivity to UV radiation. In the absence of adequate photoprotection, this leads to:

- Sunburn-like reactions.
- Hyperpigmentation.
- DNA damage.

Clinical Features

- Erythema on sun-exposed areas.
- Blistering in severe cases.
- Persistent pigmentation (*Gonçalo, 2020*) [6].

Steroid-Induced Dermatoses

Overview

Chronic misuse of topical corticosteroids, particularly on facial skin, leads to a group of conditions collectively known as steroid-induced dermatoses.

Types

- Steroid-induced rosacea.
- Perioral dermatitis.
- Skin atrophy.
- Telangiectasia.

Mechanism

Prolonged corticosteroid use suppresses collagen synthesis and alters immune responses, resulting in:

- Thinning of the epidermis.
- Vascular dilation.
- Increased susceptibility to infections.

Clinical studies describe a condition termed “steroid-dependent dermatitis”, where patients become reliant on continuous steroid use (*Chohan et al., 2014*) [3].

Pigmentary Disorders

Exogenous Ochronosis

One of the most severe consequences of hydroquinone misuse is *exogenous ochronosis*, characterized by:

- Blue–black pigmentation.
- Dermal deposition of ochronotic pigments.
- Resistance to treatment.

Post-Inflammatory Hyperpigmentation (PIH)

Inflammatory reactions from irritants or allergens can lead to increased melanin production, resulting in persistent dark patches.

Hypopigmentation

Overuse of depigmenting agents may cause uneven skin lightening and depigmented patches. (*Dadzie & Petit, 2009*) [4].

Acneiform Eruptions

Causes

- Occlusive formulations.
- Steroid misuse
- Excessive use of oily or comedogenic products

Clinical Features

- Papules and pustules.
- Comedones.
- Inflammatory lesions.

Steroid-induced acne is particularly common in individuals misusing fairness creams.

Skin Barrier Dysfunction and Sensitivity Syndrome

Repeated misuse of exfoliating and active ingredients leads to chronic skin barrier damage, resulting in:

- Persistent redness.
- Increased sensitivity.
- Burning and stinging sensations.

This condition is often referred to as “sensitive skin syndrome” and significantly reduces tolerance to even mild skincare products (*Goh et al., 2023*).

SOCIOCULTURAL AND BEHAVIORAL DRIVERS

The misuse of cosmeceuticals is not solely a pharmacological or dermatological issue; it is deeply rooted in sociocultural norms, psychological influences, and consumer behavior patterns. These drivers significantly shape how individuals perceive skin health, beauty standards, and product safety. Understanding these underlying factors is essential for developing effective prevention strategies and public health interventions.

A growing body of interdisciplinary research highlights that consumer misuse is strongly influenced by beauty ideals, media exposure, peer pressure, accessibility of products, and lack of dermatological literacy (*Dadzie & Petit, 2009; Mahajan et al., 2022*) [4]. These factors often lead to irrational decision-making and unsafe skincare practices [1].

Influence of Beauty Standards and Skin Tone Preferences

Cultural Perception of Fair Skin

In many regions, particularly in Asia, Africa, and the Middle East, lighter skin tone is often associated with:

- Beauty.
- Social status.
- Professional success.

This perception drives widespread use – and misuse – of skin-lightening cosmeceuticals, including hydroquinone and corticosteroid-containing creams.

Studies have demonstrated that individuals may continue using harmful products despite experiencing adverse effects due to strong sociocultural pressure (*Ladizinski et al., 2011*) [7].

Psychological Impact

The desire for aesthetic perfection often leads to:

- Body image dissatisfaction.
- Low self-esteem.
- Compulsive product usage.

This psychological burden encourages excessive and prolonged use of cosmeceuticals, increasing the risk of adverse reactions.

Role of Social Media and Digital Influence

Rise of “Influencer Dermatology”

Social media platforms, such as Instagram, YouTube, and TikTok, have transformed skincare trends. Influencers frequently promote:

- Multi-step skincare routines.
- High-potency active ingredients.
- DIY combinations of products.

However, these recommendations are often non-evidence-based and lack scientific validation.

Impact on Consumer Behavior

Consumers tend to:

- Trust influencer opinions over medical advice.
- Experiment with trending products.
- Overuse “active” ingredients (e.g., retinoids, acids).

This has led to the emergence of “trend-driven misuse”, where products are used based on popularity rather than suitability.

Lack of Awareness and Dermatological Literacy

A significant proportion of consumers lack basic knowledge regarding:

- Skin types.
- Appropriate product selection.
- Safe usage guidelines.

This knowledge gap results in:

- Misinterpretation of product labels.
- Incorrect application methods.
- Ignoring warning signs of adverse reactions.

Studies indicate that many users are unaware of the potential risks associated with prolonged use of cosmeceuticals (*Callender et al., 2011*) [4].

Easy Accessibility and OTC Availability

The widespread availability of cosmeceuticals without prescription contributes significantly to misuse. Products containing potent active ingredients are easily accessible through:

- Pharmacies.
- Cosmetic stores.
- Online marketplaces.

In many cases, regulatory oversight is insufficient, allowing the sale of:

- High-concentration formulations.
- Combination creams containing steroids.
- Unlabeled or counterfeit products.

This unrestricted access promotes self-medication and irrational use.

Peer Influence and Word-of-Mouth Recommendations

Consumer decisions are often influenced by:

- Friends and family recommendations.
- Testimonials.
- Community practices.

Such informal sources of information may lack scientific credibility but strongly impact purchasing and usage behavior.

Economic Factors

Cost Considerations

Consumers may prefer OTC cosmeceuticals over dermatological consultations due to:

- Lower cost.
- Immediate availability.

This economic preference leads to self-treatment, often without proper diagnosis.

Market Competition

Aggressive marketing strategies by cosmetic companies, including:

- “Instant results” claims.
- Misleading advertisements.
- Celebrity endorsements.

further encourage misuse and unrealistic expectations.

Behavioral Patterns and Risk-Taking Tendencies

Certain behavioral traits contribute to misuse, including:

- Desire for quick results.
- Experimentation with multiple products.
- Ignoring safety instructions.
- Continuation of use despite adverse effects.

These behaviors are often reinforced by temporary improvements, leading to habitual misuse.

PREVENTION AND MANAGEMENT STRATEGIES

The increasing prevalence of adverse skin reactions due to cosmeceutical misuse necessitates a comprehensive approach to prevention and management. Effective strategies must address not only clinical treatment but also consumer education, regulatory interventions, and professional involvement. A multidisciplinary framework involving dermatologists, pharmacists, regulatory authorities, and public health systems is essential to minimize risks and promote rational cosmeceutical use.

Evidence from dermatological and public health studies suggests that most adverse reactions are preventable through appropriate awareness, early diagnosis, and timely intervention (*Goh et al., 2023; Mahajan et al., 2022*).

Prevention Strategies

Consumer Education and Awareness

Educating consumers is the cornerstone of prevention. Awareness programs should focus on:

- Understanding skin types and conditions.
- Reading and interpreting product labels.
- Recognizing harmful ingredients.
- Avoiding self-medication and product overuse.

Public health campaigns and digital platforms can be effectively utilized to disseminate scientifically accurate information.

Rational Use of Cosmeceuticals

Consumers should be encouraged to follow evidence-based usage practices, including:

- Using products in recommended concentrations.
- Limiting duration of use.
- Avoiding unnecessary product combinations.
- Performing patch testing before use.

Rational use significantly reduces the likelihood of adverse reactions.

Role of Pharmacists and Dermatologists

Healthcare professionals play a critical role in guiding safe usage:

- *Dermatologists*: Diagnose conditions and prescribe appropriate treatments.
- *Pharmacists*: Provide counseling on OTC product use and potential risks.

Their active involvement can help identify misuse patterns and prevent complications.

Regulatory Interventions

Preventive measures at the regulatory level include:

- Restricting OTC availability of high-potency ingredients.
- Enforcing clear labeling requirements.
- Monitoring misleading advertisements.
- Banning harmful substances.

Strong regulatory policies can significantly reduce the availability of unsafe products.

Promotion of Cosmetovigilance

Establishing robust cosmetovigilance systems is essential for:

- Reporting adverse reactions.
- Monitoring product safety.
- Identifying high-risk ingredients.

This approach enables early detection of harmful trends and facilitates timely regulatory action.

Management of Adverse Skin Reactions

General Principles

Management of cosmeceutical-induced skin reactions involves:

- Immediate discontinuation of the offending product.
- Identification of causative agents.
- Symptomatic treatment.
- Restoration of skin barrier function.

Early intervention is crucial to prevent progression to chronic conditions.

Treatment of Specific Conditions

Irritant Contact Dermatitis

- Use of emollients and barrier repair creams.
- Mild topical corticosteroids (short-term use).
- Avoidance of irritants.

Allergic Contact Dermatitis

- Identification and avoidance of allergens.
- Topical corticosteroids.
- Oral antihistamines for itching.

Steroid-Induced Dermatoses

- Gradual withdrawal of corticosteroids.
- Use of non-steroidal anti-inflammatory agents.
- Antibiotics for secondary infections.

Pigmentary Disorders

- Discontinuation of depigmenting agents.
- Use of safer alternatives (e.g., azelaic acid).
- Laser therapy in resistant cases.

Photosensitivity Reactions

- Strict photoprotection (broad-spectrum sunscreen).
- Avoidance of photosensitizing agents.
- Anti-inflammatory treatment.

Skin Barrier Repair and Supportive Care

Restoration of the skin barrier is a key component of management:

- Use of ceramide-based moisturizers.
- Avoidance of harsh cleansers.
- Maintenance of skin hydration.

Barrier repair helps reduce sensitivity and improve skin resilience.

Behavioral Modification Strategies

Addressing behavioral factors is essential to prevent recurrence:

- Counseling patients on safe skincare practices.
- Discouraging trend-based product usage.
- Promoting realistic expectations.

Behavioral interventions are particularly important in individuals with repeated misuse patterns.

Role of Digital Platforms in Prevention

While social media contributes to misuse, it can also serve as a tool for:

- Spreading evidence-based skincare information.
- Countering misinformation.
- Promoting dermatologist-approved practices.

Collaboration with healthcare professionals can enhance the credibility of online content.

CONCLUSION

The rapid expansion of the cosmeceutical industry has transformed modern skincare practices, offering innovative solutions for aesthetic enhancement and dermatological concerns. However, this growth has been paralleled by a significant rise in consumer misuse, which has emerged as a major contributor to adverse skin reactions worldwide.

This review highlights that misuse is multifactorial, driven by behavioral patterns, sociocultural influences, easy product accessibility, and regulatory gaps. Common practices, such as self-medication, prolonged use, product layering, and off-label applications, expose individuals to potent active ingredients without adequate guidance. As a result, a wide spectrum of adverse effects – including irritant and allergic contact dermatitis, steroid-induced dermatoses, pigmentary disorders, and photosensitivity reactions – has been increasingly documented.

A critical observation is that a limited group of ingredients – particularly hydroquinone, retinoids, alpha-hydroxy acids, and topical corticosteroids – are responsible for most adverse outcomes when misused. These agents, while therapeutically effective, possess significant potential for harm when used irrationally.

Furthermore, sociocultural factors, such as the pursuit of fair skin, influence of social media, and psychological pressures, significantly contribute to unsafe consumer behavior. Regulatory shortcomings, including lack of a clear cosmeceutical classification, inadequate labeling, and weak enforcement, further exacerbate the problem.

Addressing this issue requires a multidimensional approach:

- Enhancing consumer awareness and dermatological literacy
- Strengthening regulatory frameworks and cosmetovigilance systems
- Promoting responsible marketing practices
- Encouraging active involvement of healthcare professionals

Ultimately, the safe use of cosmeceuticals depends on balancing their benefits with potential risks through evidence-based practices, informed decision-making, and effective regulation. Future efforts should focus on developing standardized guidelines and improving global surveillance systems to ensure consumer safety and reduce the burden of cosmetically induced skin disorders.

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