

Impact of Eye Cosmetics: Analysing Usage Patterns and Associated Side Effects

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Received: 26 Feb 2026, Revised: 20 Mar 2026, Accepted: 30 Mar 2026.

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ABSTRACT

The use of cosmetics has been an integral part of human life for centuries, with eye cosmetics, in particular, gaining popularity for their ability to enhance the facial appearance and boost self-esteem. This narrative review explores the history, composition, and potential health impacts of commonly used ocular cosmetics, including mascara, eyeliner, and eyeshadow. Eye cosmetics are formulated with a variety of ingredients, such as pigments, waxes, preservatives, and colourants, which can sometimes lead to allergic reactions, skin irritation, and other health concerns. The presence of preservatives like parabens and formaldehyde-releasing agents, as well as the use of fragrances and sulphates, can cause adverse effects on sensitive individuals. Furthermore, microbial contamination of cosmetics remains a critical issue, with bacteria and fungi posing risks to eye health. This review highlights the importance of consumer awareness regarding ingredient safety, proper product usage, and the potential risks associated with prolonged or improper cosmetic use. It also discusses the regulatory landscape surrounding cosmetic products, emphasising the need for stricter safety standards and transparent labelling practices. Overall, while eye cosmetics can significantly enhance appearance and self-confidence, their safety must be a primary concern for both manufacturers and consumers. By understanding the components and potential risks, users can make more informed choices to safeguard ocular health.

Keywords: Cosmetics, Eye Cosmetics, Allergic Reactions, Parabens, Eye Health, Microbial Contamination, Ocular Safety, Cosmetic Ingredients, Product Safety, Consumer Awareness.

INTRODUCTION

The use of cosmetics is not limited to the modern age. Various methods were employed even in ancient societies to enhance beauty. The majority of people from all socioeconomic backgrounds apply makeup every day to protect and beautify their bodies.^[1] Every day, millions of consumers use cosmetics, personal care products (PCPs), and their

ingredients.^[1] Cosmetics are defined as “beautifiers and/or makeup providers for the body, especially the face.”^[2] The Food and Drug Administration defines cosmetics as products applied to the skin to enhance appearance, or as substances used on the human body or any of its parts to make them more attractive, cleanse them, or alter their appearance.^[3]

Eye cosmetics have a long history dating back to ancient Egypt, when they were used for religious, therapeutic, and

aesthetic purposes.^[1] Kohl and other materials believed to protect the eyes from the sun and prevent infections were used in these early applications. The significance of eye cosmetics has changed over the centuries, but their role in enhancing beauty has never diminished. With eye cosmetics being among the most popular products, the cosmetics industry has a substantial impact on personal care. Therefore, understanding the safety and possible adverse effects of these products is essential for consumer health. The use of cosmetics has been a significant part of human life for thousands of years. They have been used to provide fragrance, protect the skin, maintain oral hygiene, enhance beauty, and paint the skin for religious and cultural purposes. Eye cosmetics, in particular, are a common part of many people's daily routines in the modern era. Surveys indicate that more than 50% of women use them to improve self-esteem and confidence.^[2] The appeal of eye cosmetics lies in their ability to highlight the eyes, one of the most expressive features of the face. However, this widespread use also raises concerns regarding ocular safety and health.^[3] As the global market for eye cosmetic products continues to grow, awareness of their potential effects on the eye, ocular adnexa, and ocular surface is also increasing. Although these products can enhance appearance, they may also pose risks, including infections, allergic reactions, and irritation. The purpose of this study is to summarise recent findings on the impact of eye cosmetics, examining both their benefits and potential adverse effects.^[4] Millions of people now incorporate eye makeup into their daily lives, and the use of these products has increased dramatically. While these products may improve appearance, they may also negatively affect ocular health. Both users and healthcare professionals must be aware of their possible effects on the eye and surrounding structures. The microbiological safety of cosmetic products has always been of particular concern to the industry, as microbial spoilage can lead to product degradation and, in the case of pathogens, may pose a risk to consumer health through contact with broken or damaged skin, potentially resulting in infection. Contemporary cosmetic formulations, due to their rich nutrient content and aqueous environment, provide ideal conditions for microbial growth, except for petrolatum-based or exclusively oily preparations such as body oils or lipsticks.

MATERIALS AND METHODS

This study is a narrative review. Data were gathered from international databases such as Web of Science, Google

Scholar, Elsevier, PubMed, ScienceDirect, and Scopus, as well as from local databases including Civilica, Medline, Iran Medex, SID, and Scirus. The search employed keywords such as makeup, women, cosmetics, allergy, and contact dermatitis, utilising both basic and advanced search techniques without restrictions on language or publication date. Initially, 87 articles were identified, and after excluding irrelevant and unrelated works, 31 articles were selected for the final review and analysis.

OCULAR COSMETIC PRODUCTS

The purpose of eye cosmetics is to draw attention to the eyes. You can apply these cosmetics to your eyelids or lashes. This article will discuss three of the most often used eye cosmetics: mascara, eye shadow, and eyeliner. Creams or gels, eye makeup removers, and lash augmentation agents are additional products applied near the ocular surface; they will also be briefly covered.

TYPES OF EYE COSMETICS

A wide range of products intended to enhance the eyes is included in the category of eye cosmetics. Eyeliner usually contains pigments, waxes, and preservatives and is available in gel, liquid, and pencil forms. Mascara, often formulated as volumising and waterproof, adds volume and definition through fibres, pigments, and waxes. Eyeshadow is composed of talc, mica, and other colourants to provide colour and texture, and is available in both powder and cream forms. Eyebrow products, including pencils, gels, and powders, are used to shape and define brows and share similar ingredients with eyeliners and eyeshadows.^[5]

TYPICAL COMPONENTS OF EYE COSMETICS

Many components found in eye cosmetics may be harmful to certain individuals. Preservatives such as parabens and formaldehyde-releasing agents can cause skin irritation and allergic reactions. Colourants, including mineral pigments and FD&C dyes, may also trigger sensitivity in some users. Additionally, emollients and fragrances, although included for texture and scent, can act as irritants.^[6]

COMPOSITION OF COSMETIC PRODUCTS

Cosmetics contain a variety of ingredients such as preservatives, emulsifiers, colourants, and fragrances. Common ingredients, including parabens, sulphates, and phthalates, have been widely scrutinised for their safety.^[7,8]

Parabens

Parabens are synthetic compounds widely used as preservatives in cosmetics, pharmaceuticals, and food products to inhibit the growth of harmful microorganisms and extend shelf life.^[9,10] Common types include methylparaben, ethylparaben, propylparaben, and butylparaben, often used in combination for increased effectiveness. Parabens have been associated with endocrine disruption due to their ability to mimic oestrogen, potentially affecting hormonal balance and contributing to reproductive issues and breast cancer. Studies have detected parabens in breast tumour tissues, raising safety concerns. Regulatory authorities permit certain parabens at low concentrations, although some types have been restricted or banned in specific regions.^[12]

Sulphates

Sulphates are surfactants commonly used in cosmetic products for their cleansing and foaming properties. Sodium lauryl sulphate (SLS) and sodium laureth sulphate (SLES) are among the most widely used compounds in shampoos and cleansers.^[11,12] These agents effectively remove oils and dirt, producing lather that is often associated with cleanliness. However, sulphates may cause skin irritation, dryness, and disruption of the skin barrier, particularly in sensitive individuals. Increased consumer awareness has led to the development of sulphate-free alternatives marketed as gentler options.^[13]

Fragrance

Fragrance refers to a mixture of natural and synthetic aromatic compounds added to cosmetics to enhance scent and mask undesirable odours. These formulations are often proprietary and not fully disclosed.^[14,15] While fragrances improve product appeal, they are a common cause of allergic reactions, including skin irritation, headaches, and respiratory symptoms. Regulatory bodies provide guidelines to limit the use of known allergens in cosmetic products.^[15]

SIDE EFFECTS OF COSMETIC USE

Skin Reactions

Acute skin reactions may occur shortly after product use, presenting as redness, itching, or burning sensations. Prolonged exposure can lead to chronic dermatitis, particularly in individuals with sensitive skin.^[16,17]

Allergic Contact Dermatitis

Allergic contact dermatitis is a major concern associated with cosmetic use, often caused by ingredients such as fragrances

and preservatives, which are among the most common allergens.^[18]

Systemic Effects

Certain cosmetic ingredients can be absorbed through the skin and may lead to systemic toxicity. Heavy metals present in some cosmetic products have been associated with toxic effects in the body.^[19]

Long-term Effects

Long-term use of cosmetics containing harmful chemicals may contribute to skin ageing, hormonal imbalance, and increased cancer risk. Some studies suggest a link between parabens and breast cancer, as well as concerns regarding reproductive health.^[22]

REGULATORY OVERVIEW

In many countries, cosmetics are regulated differently from pharmaceuticals. Regulatory authorities have limited control over cosmetic safety, leading to ongoing discussions about the need for stricter regulations.^[21]

GUIDELINES FOR SAFER COSMETIC PRACTICES

To ensure safer cosmetic use, consumers should be aware of potentially harmful ingredients and choose products labelled as free from such substances.^[20] Patch testing before using new products is recommended to identify allergic reactions. Selecting products with fewer synthetic chemicals and from brands that prioritise safety and sustainability is advisable. Staying informed through reliable sources regarding cosmetic safety and product recalls is also essential.^[23]

PRESERVATION STRATEGIES

Cosmetic manufacturers employ various strategies to prevent microbial contamination without compromising product quality.^[24] Preservation may involve synthetic or natural chemical preservatives, as well as self-preserving systems that do not rely on additional preservative ingredients. These approaches aim to inhibit microbial growth through multiple factors, often described as “hurdle technology.”^[25,26]

To ensure protection against microbial contamination, two stages of preservation are implemented: primary and secondary. Primary preservation occurs during manufacturing and is based on good manufacturing practices. Secondary preservation takes place after production and involves chemical, physical, or physicochemical methods to maintain product safety.^[27,28]

CONCLUSION

The use of cosmetics among women is influenced by multiple factors, including demographic characteristics, socioeconomic status, cultural background, and family influences.^[29,30] In modern society, many women prioritise appearance to enhance confidence and social visibility. Socioeconomic status affects access to cosmetic products, while cultural norms shape beauty perceptions and product use. Family and peer influences further reinforce cosmetic practices. As societal dynamics evolve, the increasing use of cosmetics reflects broader social and economic changes. In competitive environments, particularly in urban settings, individuals may feel increased pressure to maintain a certain appearance, thereby driving cosmetic use. Overall, cosmetic use represents a complex interaction of social identity, cultural values, and personal expression.

Ethics approval and consent to participate - Not applicable.

This article is a review based on previously published studies and does not involve any human participants, animals, or primary data collection by the authors.

Consent for publication - Not applicable.

Availability of data and materials – Not applicable. No new datasets or materials were generated or analysed in this review. All information included in this manuscript is derived from previously published articles, which have been appropriately cited.

Conflict of interest - The authors declare that they have no conflict of interest.

Funding – The authors received no specific funding for this work.

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Cite this article as: Sweatha S, Johannah Subiksha E. Impact of Eye Cosmetics: Analysing Usage Patterns and Associated Side Effects. *J Allied Health Clin Res Innov.* 2026;1(1): 44-48