

Safe Cosmetic Practices: Beauty without Harm

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Introduction

Cosmetics have become an integral part of personal grooming and self-expression in today's world. From skin care to makeup and hair products, these items play a significant role in enhancing appearance and boosting self-esteem. However, the widespread and often unregulated use of cosmetics can lead to unexpected health risks if not used responsibly. This article explores the fundamentals of cosmetic use, potential hazards, and how to adopt safe practices for long-term well-being.

Understanding Cosmetics: Definitions and Applications

Cosmetics are defined as substance or preparation that are intended to be placed in contact with various external parts of the human body or with the teeth or the mucous membranes of the oral cavity with a view exclusively or mainly to cleaning, perfuming, changing appearance correcting body odors, protecting or keeping them in good condition[1, 2].

Cosmetic products are designed for application to one or more external parts of the human body. These include the epidermis (such as the skin and the area around the eyes), the hair system, nails, lips, and external genital organs, as well as the teeth and mucous membranes of the oral cavity. The classification of a product as a cosmetic is primarily determined by its site of application and its intended cosmetic function, such as cleansing, beautifying or protecting these areas.

Cosmetic products encompass a wide range of preparations to enhance appearance, hygiene, and personal care. These include moisturizing preparations such as creams, lotions, gels, and oils; skin lightening and anti-aging products; and a variety of hair care items including tints, bleaches, shampoos, conditioners, and styling products. Other examples include bath and shower preparations, soaps, shaving products, baby

and facial wipes, depilatories, deodorants, products for external intimate hygiene, and facial masks[2]. However, it is important to note that not all personal care or beauty-related products are classified as cosmetics. Items such as massage oils, essential oils used for aromatherapy, aesthetic devices, lubricants, insect repellents, sanitary pads, hand sanitizers, and medicated creams for skin conditions like eczema or acne are not considered cosmetics. Additionally, tools like toothbrushes, dental floss, fake eyelashes, nail stickers, and temporary tattoos, as well as any substances intended for ingestion, inhalation, injection, or implantation, fall outside the regulatory definition of a cosmetic product.

Proper Use of Cosmetics

When purchasing a cosmetic product, it is essential to evaluate several key details to ensure safety and suitability. These include the product's name, intended function, instructions for use, and a clear listing of ingredients; either main or complete, depending on the packaging size. Additionally, one should verify the country and address of manufacture, batch number, date of manufacture, expiry date or best-before date, and any relevant warnings or special precautions[3].

Safe cosmetic use also depends on proper handling before and after opening. Prior to use, reading the instructions carefully. Performing a patch test; especially for products like hair dyes is highly recommended. Once opened, products should be stored as instructed, kept tightly sealed, and discarded if expired, discolored, or if any change in smell is noticed. For added safety, cosmetics should always be kept out of reach of children.

Specific caution is advised in certain situations: for instance, alcohol-based products such as eau de cologne should not be used in infants under one year, baby powders should be avoided in the perineal area of female infants, and particular care should be taken

when selecting products during the preconception period and pregnancy, especially in the first trimester. Furthermore, the use of sunscreen is encouraged to prevent photo-induced skin darkening.

Benefits of Using Cosmetics

Cosmetics Improve the overall appearance of a person without making any permanent changes in the structure or the texture of the skin. Cosmetics may camouflage skin imperfections or conditions such as melasma or vitiligo, leading to improved self confidence in those affected. Another important function is to support skin and hair health through cleansing, moisturizing and protection. In many persons, especially the young, cosmetics help one to establish an identity or make a statement.

Risks and Adverse Effects of Cosmetics

Despite their benefits, cosmetics can cause significant harm, particularly when misused or when substandard products are used. Some common adverse effects include allergic reactions (especially from fragrances or preservatives), acne (Figure 1), changes in pigmentation (Figure 2), fungal infections, telangiectasia (Figure 3), stretch marks (Figure 4) and perioral dermatitis[4].



Figure 1: Cosmetic acne



Figure 2: pigmentation of hands



Figure 3: telangiectasia



Figure 4: steroid induced striae

Hair dye allergy: Hair dye allergy is a relatively common adverse reaction that typically develops after repeated use, rather than upon the first exposure. Allergy can occur with various forms of permanent and semi-permanent hair coloring agents, including black henna and dye-based shampoos. The usual allergen is paraphenylenediamine, or PPD[5]. N-Isopropyl-N-Phenyl- paraphenylenediamine (IPPD), which may be found in some rubber products, can act as a sensitizer for those with allergy to PPD[6]. Other potential allergens in hair dye include other aromatic amines, preservatives and fragrances[6]. Clinical manifestations often include itching, redness, eczematous rashes on the scalp, or facial swelling, usually emerging immediately or within two to three days after application. Management involves the use of topical or oral corticosteroids along with antihistamines to alleviate symptoms. Discontinuation of the offending product is mandatory. It has to be borne in mind that the allergy is due to the PPD, which is the usual ingredient in all permanent hair dye. Hence,

changing the brand of the dye is of no use. In some cases, safer alternatives free of PPD may be considered, but these products need frequent applications.

Common allergens in cosmetic products[7, 8]:

- Fragrance mixes I and II
- Balsam of Peru
- Methylchloroisothiazolinone / methylisothiazolinone (MCI/MI) (in leave on products)
- Lanolin alcohol

Awareness of these components is crucial for individuals with sensitive skin or a history of allergies.

The Hidden Dangers of Skin Whitening Creams

Skin whitening creams have gained widespread popularity due to aesthetic preferences and societal pressures. However, the ingredients used in many of these products can pose significant health hazards if not properly regulated or used under medical supervision.

A common active ingredient in whitening creams is hydroquinone, a depigmenting agent that inhibits melanin production. The accepted upper limit of hydroquinone (HQ) in prescription products is 4%. Its metabolites such as p-benzoquinone and glutathione conjugates formed in the liver and bone marrow, can cause DNA damage, genetic mutations, and disrupt cellular protective mechanisms, thereby increasing the risk of cancer. In the bone marrow, these metabolites may also contribute to serious conditions like aplastic anemia and acute myeloid leukemia, similar to effects observed in benzene toxicity. Nephrotoxicity, hepatic and renal adenomas and leukaemia has been reported in animal models following systemic absorption of HQ. Because of the concerns of these side effects in humans, US FDA and many other regulatory authorities have banned HQ in over-the-counter skin lightening products[9, 10]

Exogenous ochronosis, characterized by bluish-black pigment deposits on the skin, is a disfiguring condition linked to chronic hydroquinone use. Although there is currently no direct evidence linking topical hydroquinone use to cancer in humans, healthcare professionals should remain cautious of its possible systemic effects.

Additionally, these creams often contain topical

corticosteroids, particularly high-potency steroids such as clobetasol, betamethasone and mometasone, which are inappropriate for facial use and can lead to long-term skin damage. Potent steroids in these creams may cause suppression of the hypothalamic-pituitary-adrenal (HPA) axis. Steroid dependency, where the skin becomes reliant on corticosteroids for normal appearance, is another concerning outcome. Other documented side effects include poor wound healing, thinning of the skin, stretch marks, permanently dilated capillaries (telangiectasia) increased risk of infections, and serious systemic consequences such as nephropathy. International League of Dermatological Societies issued a position statement in 2025 calling for global action on skin bleaching and the misuse of topical corticosteroids[11]

Heavy metals, including mercury and lead, are also frequently detected in these products, despite their known systemic toxicity. In the Sri Lankan context, laboratory testing for heavy metals in cosmetic products is carried out on a regular basis. The Consumer Affairs Authority recently published a list of 49 products containing mercury over the approved limit, which is 1 part per million. Some of these products are known to contain very high amounts of mercury and lead[12].

A study conducted in Iran assessed the presence of toxic metals such as lead, cadmium, and chromium in various lipstick brands from different countries[13]. Although the metal concentrations were within internationally accepted limits, significant variations were found between brands. Findings revealed that over 50% of the lipstick brands posed a potential health risk due to the presence of toxic metals. The authors emphasize the need for continuous monitoring of heavy metal content in cosmetics, especially considering the cumulative exposure from the use of multiple cosmetic products[13].

Systemic absorption of mercury may give rise to serious adverse effects. Nephropathy, both minimal change and membranous types have been reported[14-18]. Although penetration of the blood-brain barrier by inorganic mercury is poor, prolonged exposure can result in central nervous system (CNS) accumulation and neurotoxicity[19, 20]. Evaluation of the urine mercury concentration is supposed to be the best marker of mercury poisoning[19]. Other effects

reported in chronic use of mercury containing products include skin pigmentation and nail discolouration[21, 22]. Effects of methylmercury on the growing foetus have been well recorded. Neuropsychiatric symptoms and developmental delay have been reported[23-27].

Glutathione (GSH), a naturally occurring antioxidant, has gained popularity for its skin lightening effects, particularly through intravenous (IV) administration, despite limited scientific support. There is no clinical research supporting the safety or efficacy of long-term IV glutathione use for cosmetic purposes. Importantly, the lack of data on chronic use raises serious safety concerns[28]. One theoretical risk includes a shift from eumelanin to pheomelanin, potentially increasing the susceptibility to sun-induced skin cancers. The widespread and unregulated availability of injectable glutathione, especially from online sources further amplifies the danger of adverse effects and infusion-related complications.

Given these risks, the use of skin whitening creams especially those purchased without proper labeling or regulatory approval should be approached with extreme caution. Public awareness and stronger regulatory enforcement are essential to prevent the harmful consequences associated with these products.

Cosmetic Products and risk of cancer

There is growing concern and ongoing investigation into whether cosmetics contribute to risk of cancer. While definitive links are yet to be proven, studies have raised red flags about several types of cosmetics

Skin lightening products: there is a theoretical risk of skin cancer in long term usage of skin lightening products. Melanin, in particular eumelanin, absorbs UV radiation thus preventing the possible DNA damage due to UV rays. In addition, melanin has some antioxidant properties scavenging free radicals formed by UV radiation.

Thus, the reduced amount of melanin due to prolonged use of skin lightening products is likely to predispose individuals to skin cancer. So far, several case reports, most of them from Africa, of Squamous cell carcinoma occurring in persons using skin lightening products have been reported[29-32].

Hair dyes: Studies conducted in Finland, USA

among both black and white individuals found evidence that prolonged use of hair dyes and hair straighteners may increase the risk of breast cancer[33]. Black individuals and prolonged users were at higher risk. A meta-analysis concluded that there is 18.8% increased risk of future breast cancer among hair dye users[34]

Talc-based powders: Several systematic reviews and meta-analyses confirm that there is increased risk of ovarian cancer associated with frequent perineal powder exposure.[35-37]. The use of talcum powder on the perineal region of females is strongly discouraged.

Antiperspirants: There is a popular belief that antiperspirants and deodorants pose a risk for breast cancer. Several meta-analyses of published literature failed to find a causative association between antiperspirants/ deodorants and breast cancer[38, 39].

In Sri Lanka, skin cancer incidence is on the rise. Although no direct association with cosmetic use has been established, the need for prospective studies on this subject is evident.

Conclusion

Cosmetics, when chosen and used wisely, can be valuable tools in enhancing personal appearance and self-esteem. However, the unregulated or indiscriminate use of certain products, especially whitening creams and hair dyes can lead to significant health complications. As consumers, awareness and caution are crucial. Always opt for safe, approved products, use them as directed, and consult healthcare professionals when in doubt. Beauty should never come at the cost of your health.

References

1. FDA, U. Cosmetics and US law. Cosmetic rules and regulations 2024 20/08/2025]; Available from: https://www.fda.gov/cosmetics/cosmetics-laws-regulations/cosmetics-us-law#US_Law.
2. Commission, E. Glossary and Acronyms related to cosmetics legislation. 2015 20/08/2025]; Available from: <https://ec.europa.eu/docsroom/documents/13021/>.
3. FDA, U. Using Cosmetics safely. Resources for consumers on cosmetics 2024 20/08/2025]; Available from: <https://www.fda.gov/cosmetics/>

- resources-consumers-cosmetics/using-cosmetics-safely.
4. Lucca, J.M., et al., An observational study on adverse reactions of cosmetics: The need of practice the Cosmetovigilance system, Hydroquinone and its analogues in dermatology - a potential health risk. *Saudi Pharm J*, 2020. 28(6): p. 746-753.
 5. Mukkanna, K.S., N.M. Stone, and J.R. Ingram, Para-phenylenediamine allergy: current perspectives on diagnosis and management. *J Asthma Allergy*, 2017. 10: p. 9-15.
 6. Thomas, B.R., et al., Positive relationship-intensity of response to p-phenylenediamine on patch testing and cross-reactions with related allergens. *Contact Dermatitis*, 2014. 71(2): p. 98-101.
 7. Schnuch, A., C. Szliska, and W. Uter, [Facial allergic contact dermatitis. Data from the IVDK and review of literature]. *Hautarzt*, 2009. 60(1): p. 13-21.
 8. Kasemsarn, P.L., T., Bhoonchai, W., Risk factors and common contact allergens in facial allergic contact dermatitis patients. *Int J Dermatol*, 2016. 55: p. 417 - 24.
 9. FDA, U. Skin Products Containing Mercury and/or Hydroquinone. Health fraud, scams 2023 20/08/2025]; Available from: <https://www.fda.gov/consumers/health-fraud-scams/skin-products-containing-mercury-andor-hydroquinone>.
 10. Philippines, F. FDA Advisory No. 2020-2081 || Public Health Warning Against the Purchase and Use of Cosmetic Products Containing Banned Ingredient/s as Reported in the ASEAN Post-Marketing Alert System (PMAS):. 2020 20/08/2025]; Available from: <https://www.fda.gov.ph/fda-advisory-no-2020-2081-public-health-warning-against-the-purchase-and-use-of-cosmetic-products-containing-banned-ingredient-s-as-reported-in-the-asean-post-marketing-alert-system-pmas/>.
 11. Dlova, N. ILDS Warns Against the Misuse of Topical Corticosteroids and Calls for Global Action on Skin-bleaching: Updated position statement advocates for improved patient protection and education. 2025 31/03/2025 20/08/2025].
 12. Consumer Affairs Authority, S.L. Hazardous skin cream products containing mercury. hazardous products details 2025 20/08/2025]; Available from: https://caa.gov.lk/web/index.php?option=com_content&view=article&id=890&Itemid=839&lang=en.
 13. Malvandi, H. and F. Sancholi, Assessments of some metals contamination in lipsticks and their associated health risks to lipstick consumers in Iran. *Environ Monit Assess*, 2018. 190(11): p. 680.
 14. Olumide, Y.M., et al., Complications of chronic use of skin lightening cosmetics. *Int J Dermatol*, 2008. 47(4): p. 344-53.
 15. Tang, H.L., et al., Minimal change disease following exposure to mercury-containing skin lightening cream. *Hong Kong Med J*, 2006. 12(4): p. 316-8.
 16. Tang, H.L., et al., Minimal change disease caused by exposure to mercury-containing skin lightening cream: a report of 4 cases. *Clin Nephrol*, 2013. 79(4): p. 326-9.
 17. Wu, S., B. Han, and X. Xiong, A Patient With Proteinuria, Myalgias, and Decreased Pigmentation of Facial Skin. *Jama*, 2024. 332(4): p. 329-330.
 18. Gao, H., et al., Nephrotic syndrome of minimal change disease following exposure to mercury-containing skin lightening cream: A case report and literature review. *Clin Nephrol*, 2022. 98(2): p. 107-112.
 19. Chan, T.Y., Inorganic mercury poisoning associated with skin-lightening cosmetic products. *Clin Toxicol (Phila)*, 2011. 49(10): p. 886-91.
 20. Benz, M.R., et al., Hyperintense lesions in brain MRI after exposure to a mercuric chloride-containing skin whitening cream. *Eur J Pediatr*, 2011. 170(6): p. 747-50.
 21. Böckers, M., R. Wagner, and O. Oster, [Nail dyschromia as the leading symptom in chronic mercury poisoning caused by a cosmetic bleaching preparation]. *Z Hautkr*, 1985. 60(10): p. 821-9.
 22. Dyall-Smith, D.J. and J.P. Scurry, Mercury pigmentation and high mercury levels from the use of a cosmetic cream. *Med J Aust*, 1990. 153(7): p. 409-10, 414-5.
 23. Hamada, R., K. Arimura, and M. Osame, Maternal-fetal mercury transport and fetal methylmercury poisoning. *Met Ions Biol Syst*, 1997. 34: p. 405-20.

24. Marsh, D.O., et al., Fetal methylmercury poisoning. Relationship between concentration in single strands of maternal hair and child effects. Arch Neurol, 1987. 44(10): p. 1017-22.
25. Marsh, D.O., et al., Fetal methylmercury poisoning: clinical and toxicological data on 29 cases. Ann Neurol, 1980. 7(4): p. 348-53.
26. Newland, M.C., E.M. Paletz, and M.N. Reed, Methylmercury and nutrition: adult effects of fetal exposure in experimental models. Neurotoxicology, 2008. 29(5): p. 783-801.
27. Wang, J., et al., Relation of prenatal low-level mercury exposure with early child neurobehavioral development and exploration of the effects of sex and DHA on it. Environ Int, 2019. 126: p. 14-23.
28. Davids, L.M., J.C. Van Wyk, and N.P. Khumalo, Intravenous glutathione for skin lightening: Inadequate safety data. S Afr Med J, 2016. 106(8): p. 782-6.
29. Gbandama, K.K.P., et al., Squamous Cell Carcinoma Associated with Cosmetic Use of Bleaching Agents: About a Case in Ivory Coast [Squamous cell carcinoma associated with use of skin-lightening cream]. Case Rep Dermatol, 2019. 11(3): p. 322-326.
30. Ly, F., et al., Cutaneous squamous cell carcinomas (SCC) associated with cosmetic skin whitening: 8 cases reported in Senegal. Ann Dermatol Venereol, 2018. 145(2): p. 83-88.
31. Ly, F., et al., [First cases of squamous cell carcinoma associated with cosmetic use of bleaching compounds]. Ann Dermatol Venereol, 2010. 137(2): p. 128-31.
32. Mouhari-Toure, A., et al., Multiple Squamous Cell Carcinoma in a Patient Using Skin Bleaching Products in Togo. Case Rep Dermatol Med, 2023. 2023: p. 8002896.
33. Heikkinen, S., et al., Does Hair Dye Use Increase the Risk of Breast Cancer? A Population-Based Case-Control Study of Finnish Women. PLoS One, 2015. 10(8): p. e0135190.
34. Gera, R., et al., Does the Use of Hair Dyes Increase the Risk of Developing Breast Cancer? A Meta-analysis and Review of the Literature. Anticancer Res, 2018. 38(2): p. 707-716.
35. Penninkilampi, R. and G.D. Eslick, Perineal Talc Use and Ovarian Cancer: A Systematic Review and Meta-Analysis. Epidemiology, 2018. 29(1): p. 41-49.
36. Taher, M.K., et al., Data on systematic review and meta-analysis of epidemiologic evidence on the association between perineal use of talc powder and risk of ovarian cancer. Data Brief, 2020. 29: p. 105277.
37. Woolen, S.A., A.A. Lazar, and R. Smith-Bindman, Association Between the Frequent Use of Perineal Talcum Powder Products and Ovarian Cancer: a Systematic Review and Meta-analysis. J Gen Intern Med, 2022. 37(10): p. 2526-2532.
38. Hangan, T., G. Bjorklund, and S. Chirila, Exploring the Potential Link between Aluminum-Containing Deodorants/Antiperspirants and Breast Cancer: A Comprehensive Review. Curr Med Chem, 2025. 32(3): p. 417-433.
39. Trinh, T.T.K., et al., Use of Antiperspirant Products and Risk of Breast Cancer: A Meta-Analysis of Case-Control Studies. Cancer Invest, 2024. 42(9): p. 782-792.



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