

Personal-Care Cosmetic Practices in Pakistan: Current Perspectives and Management

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Abstract: To look superior and acceptable in society, people from all over the world use various types of cosmetic products to enhance or alter their facial appearance and body texture. In recent times, an exponential surge in cosmetic use has been observed in Pakistan, and hence spending money on personal-care products is high. However, there are many reported facts about high loads of lead, mercury, copper, and others hazardous and cancerous elements in local Pakistani cosmetic brands. Consumers of these brands are at high risk of many clinical issues, including cancer. As such, it is a necessity to make people aware of the devastating harmful effects related to cosmetic use. The aim of this study was to provide information for stakeholders and raise awareness in the general public about the use of these local unauthorized personal-care cosmetic products, along with government strategies to stop this cosmetic blight on human health.

Keywords: cosmetics, cancer, health issues, mercury, Pakistan

Introduction

Cosmetics are products that are applied on external parts of the body to clean and protect, thus altering one's appearance or keeping those parts in good condition. Our external look plays a significant role in our daily social interactions, as a white complexion in many cultures is considered a mark of beauty in both men and women. General ingredients of cosmetics are formaldehyde, quaternium-15, heavy metals, methylchloroisothiazolinone, methylisothiazolinone, parabens, lanolin, colophonium, and p-phenylenediamine (PPD). Many of these ingredients are recognized as being safe or having a low toxicological contour, but others have concentrations of noxious chemicals that pose a significant risk of causing adverse reactions.¹ Adverse effects of cosmetics are mostly reactions of the skin, such as contact dermatitis (allergic and irritant), phototoxic and photoallergic reactions, contact urticaria, and hypo/hyperpigmentation. However, possible adverse systemic effects have also been reported, eg, intoxication, lung dysfunction, and carcinogenic effects.² For example, cosmetics with high level of lead and aluminum harm can result in juvenile delinquency and behavioral problems in children, while adulthood exposure to aluminum induces cholinotoxicity.^{3,4} Researchers have also confirmed that excessive use of these cosmetic items can disturb the hormones and lead to risks in pregnancy, with short gestational time in women and low sperm count in men.⁵⁻⁷ Due to greater practice, women are at more risk of acquiring hypersensitivity to ingredients of cosmetics than men. Whitening products used by women to keep their skin toned and beautiful contain hazardous substances for bleaching

purposes, ie, hydroquinone, mercury, kojic acid, and vitamin C, which can affect their health, and more dangerously these products are easily available in markets.^{8,9}

Nowadays, toiletries and skin lightening (bleaching) are widely used all over the world especially in African and Asian countries, but there is a lack of public awareness about the right use of cutaneous creams in recommended quantities and their adverse effects on skin.¹⁰ Many quality-oriented cosmetic brands are positively regarded and favored by customers, but at the same time due to financial issues, most of the population is unable to afford those costly branded cosmetics. As such, they depend on local markets selling cheap, low-quality cosmetic items with such active ingredients as mercury, corticosteroids, and hydroquinone, which pose serious risks.¹¹ It has been reported that impaired wound healing, fish-odor syndrome, steroid-addiction syndrome (exogenous), a broad spectrum of cutaneous wound infections, and endocrinological issues with corticosteroids (suppression of hypothalamic–pituitary–adrenal axis) are associated with the use of these products.¹² Although the skin provides a protective barrier, but certain ingredients and contaminants have the ability to penetrate the face, lips, or eyes and produce adverse local or systemic effects.^{13,14} Recently in Pakistan, an exponential surge in cosmetic products has been observed, where a person wears cosmetics to look superior and to be acceptable in society. Cosmetic-manufacturing units in Pakistan prompt the public to buy their products through electronic and print media. Pakistani women spend much money on purchasing personal-care grooming products and support the industry to grow more.^{15,16} According to one survey, Pakistanis spend Rs101 billion per year on personal-care products, ie, 4% of all household expenditure in the country.¹⁷ Unfortunately, in Pakistan these products are easily available at local stores, instead of only at pharmacies or at regular medical stores.

The majority of manufacturing units are unauthorized and working illegally on a large scale. According to a 2018 reports by a joint effort of the Ministry of Climate Change and the Sustainable Development Policy Institute, Islamabad, Pakistan, assessment of the quality of 59 local and international brand products revealed only three manufacturers were using standard mercury quantities, while the remaining 56 included excessive amounts (0.74–44,292ppm) in their products compared to the permissible 1ppm limit.^{18–21} A report by the European Environmental Bureau indicated that Pakistan exports many mercury-loaded toxic skin-whitening creams to countries like Bangladesh and the Philippines.²² According to a published report by the BBC, trading centers had recently cracked on down many Pakistan brands, especially beauty

creams, containing chemicals (hydroquinone, mercury, or corticosteroids) as core ingredients.²³ In this study, we highlight the use of these cheaper and locally manufactured nonstandard cosmetics and the associated health risks by summarizing the available data from different sources, including scientific and government publications, newspaper articles, and other comparison studies on the commonest-used cosmetic items. We also report on some international brands that exceed hazard levels of noxious ingredients.

Skin-Whitening Creams and Lotions

Pakistan has been named among countries with high levels of mercury (third–most hazardous chemical) in various cosmetic products, in which skin-whitening creams come out on top of famous brands with highest sales.¹⁹ The use of skin-whitening creams for fair complexion was considered effective by a majority of women (59%) in one study conducted in Pakistan, and they also agreed that a lighter skin tone was more beautiful and the use of skin-lightening products strongly associated with achieving a fair complexion.²⁴ A Sustainable Development Policy Institute report has revealed the presence of high quantities of mercury and other heavy metals in skin-whitening creams found in Karachi, Lahore, Islamabad, Peshawar and other big cities of Pakistan.²⁵ Most Pakistani cosmetic companies have high levels of mercury in their creams, facial lotions, and other skin-whitening products, which may pose a serious health risk to innocent customers. Tables 1 and 2 list both national and international brands of skin-whitening creams in Pakistan with high loads of deadly toxic chemicals.²⁰

Mehndi (Henna) and Black Mehndi Pakistani Brands

Henna and black *mehndi* are widely used Pakistani products. There are 30–40 *mehndi* brands in Pakistani markets for which the details of the contained ingredients are totally absent. According to research from Karachi University, these products contain toxic chemicals (such as oxalic acid, sodium picramate, and titanium dioxide), textile dyes, carcinogenic substances, highly volatile organic solvents (camphor and terpineol), and other heavy metals, including PPD, lead, chromium, and nickel which not only cause allergic reactions but also penetrate blood vessels and damage body organs.²⁶ Figure 1 illustrates PPD action on skin.

Table I List of local skin-whitening creams containing high doses of mercury in Pakistan

| Number | Cream name | Sample ID | Hg (ppm) | Hg more than standard (ppm) |
|--------|-------------------------------------------------|-----------|----------|-----------------------------|
| 1 | Skin White milk and haldi cream | IC-35 | 0.8 | < 20 |
| 2 | Hemani Advance herbal whitening cream | C0017 | 2.59 | 159 |
| 3 | Goree beauty cream | C0012 | 4.39 | 339 |
| 4 | Fair & Lovely advanced multivitamin (Pakistani) | C001 | 5.02 | 402 |
| 5 | Current Fairness cream | C0015 | 8.45 | 745 |
| 6 | Hitone whitening cream | C0023 | 9.11 | 811 |
| 7 | Skin White gold beauty cream | LC-21 | 13.49 | 1.249×10 ³ |
| 8 | Face Fresh cleanser cream | LC-28 | 19 | 1.8×10 ³ |
| 9 | Skin Clear whitening cream | C008 | 21 | 2×10 ⁴ |
| 10 | Gipsy with jojoba oil | P-45 | 36.29 | 3.5×10 ³ |
| 11 | Blush On beauty cream | C002 | 65 | 6.4×10 ³ |
| 12 | Permanent whitening cream | X-46 | 128 | 1.2×10 ⁴ |
| 13 | Whiteface whitening cream | IC-34 | 324.7 | 3.2×10 ⁴ |
| 14 | White Touch whitening cream | C0013 | 1257 | 1.2×10 ⁵ |
| 15 | Face Tonic whitening formula | P-42 | 1,405 | 1.4×10 ⁵ |
| 16 | CinciBrido whitening cream | KC-37 | 1,479 | 1.479×10 ⁵ |
| 17 | Nine Herbs whitening cream | C006 | 2,420 | 2.41×10 ⁵ |
| 18 | Era beauty cream | C007 | 2,458 | 2.458×10 ⁵ |

(Continued)

Table I (Continued).

| Number | Cream name | Sample ID | Hg (ppm) | Hg more than standard (ppm) |
|--------|-----------------------------------------------------|-----------|----------|-----------------------------|
| 19 | Alpha white beauty cream | C0016 | 3,923 | 3.922×10 ⁵ |
| 20 | Biocos emergency whitening cream | C0021 | 5,129 | 5.128×10 ⁵ |
| 21 | Dermolite whitening cream | C0019 | 6,035 | 6.03×10 ⁵ |
| 22 | Pure White beauty whitening cream | I.C-23 | 7,862 | 7.861×10 ⁵ |
| 23 | Look Fresh beauty cream | IC-41 | 7,912 | 7.911×10 ⁵ |
| 24 | Forever skin-whitening cream | C0014 | 8,181 | 8.18×10 ⁵ |
| 25 | Denso beauty cream | C009 | 9,681 | 9.68×10 ⁵ |
| 26 | White Secret beauty cream | C004 | 10,369 | 1.03×10 ⁶ |
| 27 | Sandal whitening Beauty Cream | LC-27 | 12,044 | 1.2043×10 ⁶ |
| 28 | Lead whitening cream | X-47 | 13,658 | 1.3657×10 ⁶ |
| 29 | Infocus pearl beauty cream | C0020 | 14,493 | 1.4492×10 ⁶ |
| 30 | White Face whitening cream | LC-29 | 14,895 | 1.4895×10 ⁶ |
| 31 | Sandal whitening beauty cream | C0018 | 15,566 | 1.55×10 ⁶ |
| 32 | Cherry skin-whitening cream | C005 | 15,710 | 1.579×10 ⁶ |
| 33 | White Gold whitening cream with blackberry extracts | LC-22 | 15,795 | 1.5794×10 ⁶ |
| 34 | Zuni beauty cream (female) | C0010 | 15,973 | 1.5972×10 ⁶ |
| 35 | Maxdif skin-brightening cream | C0022 | 16,004 | 1.6×10 ⁶ |

(Continued)

Table 1 (Continued).

| Number | Cream name | Sample ID | Hg (ppm) | Hg more than standard (ppm) |
|--------|---------------------------------|-----------|----------|-----------------------------|
| 36 | Due whitening cream | KC-50 | 16,805 | 1.6804×10 ⁶ |
| 37 | Winsome whitening beauty cream | P-44 | 18,173 | 1.8172×10 ⁶ |
| 38 | Zuni beauty cream for men | C0011 | 18,177 | 1.8176×10 ⁶ |
| 39 | White Gold whitening cream | C003 | 19,069 | 1.9068×10 ⁶ |
| 40 | Delicate whitening beauty cream | IC-39 | 23,780 | 2.3779×10 ⁶ |
| 41 | Parley herbal whitening cream | LC-29 | 40,131 | 4.013×10 ⁶ |

Notes: From a joint project of the Ministry of Climate Change and Sustainable Development Policy Institute, Islamabad, Pakistan. Results showed that most SWC brands had the potential to cause mercury toxicity affecting the general public health. Techniques used for mercury analysis were HGASS and ICP.^{19,25}

Black Stone (*Kala Pathar*)

Due to low cost and easy availability, many Pakistani women opt to color their hair with black stone. Black stone's ingredients are very harmful and used as a poison for suicide. Major components of its composition are PPD, sodium, EDTA, and propylene glycol, which contribute to multiorgan failure.²⁷ Excessive use of black stone may cause liver, respiratory system, and kidney problems.²⁸

Surma/*Kajal*

Eye make-up in various cultures is favored by many, particularly women. In Pakistan, surma/*kajal* is a very popular eye cosmetic and widely used all over the country. It is a fine powder of heavy crystal or lead sulfides. Pakistani surma contains 0.03%–81.37% lead and it is highly toxic to the eyes. Lead penetrates into blood vessels and accumulates in the liver, thereby causing harmful diseases, including cancer.²⁹ Applications of surma on umbilical stumps of newborns also plays an important role in increasing blood-lead levels in children from developing countries.^{30,34} Lining the eyes with surma/*kajal*, rubbing, and then licking the fingers enhances the absorption of lead, causing elevated blood-lead levels.^{31,32} The highest concentration of lead (1,071 µg/g) detected in surma was at Kohat market, Khyber Pakhtunkhwa, Pakistan.³³ In various eye-make-up procedures, cosmetic products

Table 2 International skin-whitening creams in Pakistan with high volumes of mercury

| Number | Name of cream | Sample ID | Hg (ppm) |
|--------|------------------------------------------------------|-----------|----------|
| 1 | Co Natural whitening cream | C0034 | 1.88 |
| 2 | Palmer's Skin Success | C0035 | 1.94 |
| 3 | Garnier Skin Naturals Speed White | IC-38 | 1.98 |
| 4 | Garnier Light Complete White Speed | C0033 | 2.11 |
| 5 | Nivea Natural Fairness | C0030 | 4.2 |
| 6 | Ponds white beauty cream | LC-25 | 5.01 |
| 7 | Olay Natural White | C0029 | 5.41 |
| 8 | Olive whitening cream | C0024 | 8.31 |
| 9 | Garnier Skin Naturals White Complete | LC-24 | 15.52 |
| 10 | Eveline Cosmetics White Extreme, 3D | C0032 | 9.27 |
| 11 | Stillman's skin bleach cream | IC-36 | 44,292 |
| 12 | Fair and Lovely | P-43 | 40 |
| 13 | Vince skin lightening night cream | C0028 | 21.35 |
| 14 | Fair and Lovely Max Fairness Multi Expert face cream | IC-40 | 21 |
| 15 | Ponds Flawless White | C0031 | 0.74 |
| 16 | YC whitening pearl cream | C0025 | 0.93 |
| 17 | Fair & Lovely advanced multivitamin | C0026 | 1.43 |
| 19 | Janssen Cosmetics brightening night restore | C0027 | 1.82 |

Notes: From a joint project of the Ministry of Climate Change and Sustainable Development Policy Institute, Islamabad, Pakistan. The results showed that most SWC brands had the potential to cause mercury toxicity, affecting both the skin and general public health. Techniques used for mercury analysis were HGASS and ICP. OES.^{19,25}

can slip into the eyes and produce adverse effects on the ocular surface, ranging from mild discomfort to vision-threatening conditions.³⁴

Pakistani Nail-Polish Brands

Nail polish contains toxic aromatic chemicals, such as formaldehyde, toluene, and dibutyl phthalate. Formaldehyde is considered carcinogenic, and causes skin, eye, nose and throat irritation. Nail polish in Pakistan contains high

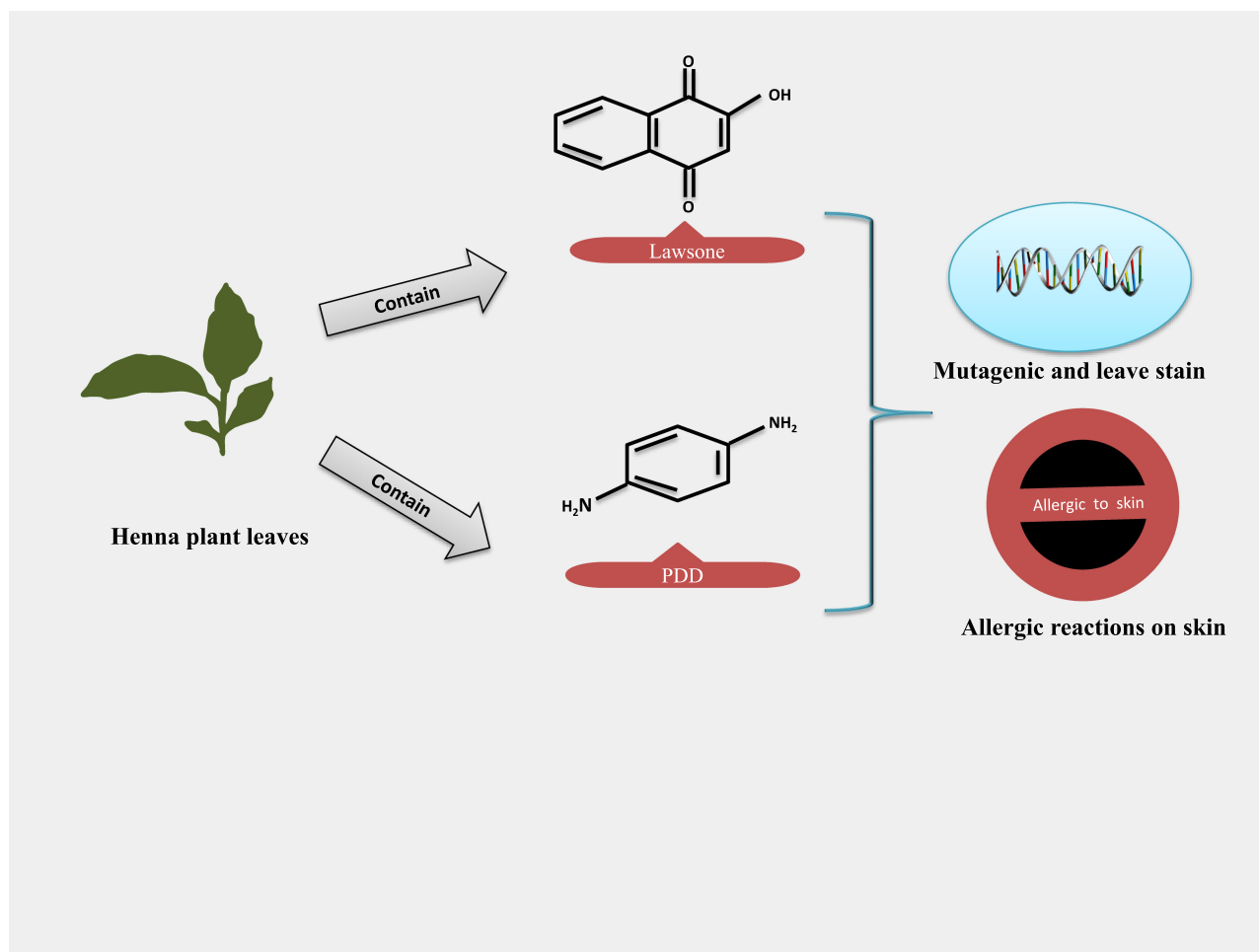


Figure 1 Mutagenic effects of the henna plant and PPD action on skin. Leaves of the henna plant contain a red-orange dye (lawsone, also known as hennotannic acid) and PPD, which causes allergic and inflammatory reactions that develop carcinogenic effects.^{92,93}

quantity of toluene, which can be adsorbed into the skin through the nail beds, resulting in dizziness, headache, and fatigue.³⁵ Arterial oxygen saturation level (SpO_2) in the blood is important for normal body physiology. Different nail polishes of different colors decrease SpO_2 in the body and cause respiratory disorders, hypothermia, and other dysfunction.³⁶ A Pakistani hair and skin cancer expert said that excessive use of nail polish can lead to dryness and weakening of nails, even discoloration.³⁷

Facial Hair and Cosmetics

Having facial hair is a common and distressing problem for women. Laser therapy is a permanent solution to this. This treatment demands well-qualified, experienced, and skillful electrolgists, but unfortunately unqualified and unscrupulous people in the country are using this methodology only for the sake of money.³⁸ Many side effects have been reported with local facial creams to remove facial hair. Calcium hydroxide and potassium

thioglycolate are present in hair-removal products. Such cosmetic items contain heavy metals that make the skin red and cause rashes on sensitive parts of the body, sexual and allergic problems, bed smell, and increase the risk of cancer.³⁹

Lipsticks

A commonly cited aphorism is that “women accidentally eat about 4 lb of lipsticks in a lifetime”. Other than skin-whitening creams and lotions, lip cosmetics are more dangerous, as lips are more susceptible to absorption and present an oral route of exposure to chemicals. During drinking, eating, and kissing, one can ingest harmful ingredients of lipsticks. These products also increase levels of heavy metals, eg, lead, in the body. Lipsticks that contain high amounts of lead are very dangerous for pregnant women, because it can simply pass through the placenta.⁴⁰ It has been found that some cosmetics markets in Khyber Pakhtunkhwa, Pakistan are selling lipsticks with high concentrations of Fe, Zn, Pb, and Cu. Prolonged use of such

Table 3 Commonly used cosmetic items and their adverse consequences on consumer health

| Number | Cosmetics | Ingredients | Use | Side effects |
|--------|-------------------------------------------------------------|------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| 1 | Lipsticks | Manganese, lead, cadmium, titanium dioxide, aluminum, formaldehyde, and parabens | Volatile white and yellow colors | Carcinogenic, renal failure, coughing, and hazards in pregnancy ^{40,41,43-45} |
| 2 | Kohl (surma) | Lead sulfide | Darkening of eyelids | Increased lead levels in blood and damage to the liver ^{30-34,46} |
| 3 | Nail polish | Formaldehyde, nitrocellulose, plasticizers, iron oxides, manganese, benzophenone I | Ticking agent, coloring agent, and nonbrittle film to stop bacterial or fungal infections in cosmetics | Nausea, respiratory problems, cognitive and neurological symptoms, uncontrollable muscle contraction. ^{35-37,47,48} |
| 4 | Eye and facial makeup, baby wipes, and household detergents | Diazolidinyl urea, DMDM, methylisothiazolinone, phenoxyethanol, mercury, copper, titanium, tretinoin | Cleanser, killing bacteria, slowing and preventing spoilage, facial expression | Headaches, allergic reactions, burning of skin, carcinogenic ⁴⁹⁻⁵¹ |
| 5 | Hair care, moisturizers, shaving products | Parabens, salicylate, coloring agents | Preventing bacterial growth, ultraviolet-light absorbance | Skin irritation, blotches, blemishes ^{39,52} |
| 8 | Shampoo, body soap, toothpaste | Sodium sulfate and laureth sulfate, fluoride, triclosan, diethanolamine, triethanolamine | Cleansing and emulsifying agent | Hair loss, breast cancer, skin irritation, possible impurity contamination ⁵³ |
| 9 | Aging and skin-care products | Beta-hydroxy-acids, dihydroxyacetone, phthalates, salicylic acid | Improving skin texture, reducing signs of aging, stopping harmful ultraviolet radiation | Effects in pregnancy, skin burning, allergic reactions ⁵⁴ |
| 10 | Face makeup, hair products | Diethanolamine, polyethylene glycol | pH adjuster, foaming agent | Skin irritation, contamination concerns ⁵² |

products containing these elements may pose a threat to human health and the environment.³³ Lipsticks containing toxic heavy metals can be ingested along with other cosmetics containing heavy metals through the oral pathway.⁴¹

Skin-Whitening Soaps: Pakistani Brands

Soaps and creams are skin-lightening products. Pakistan has many brands producing low quality soaps containing about 31 mg/kg and 33,000 mg/kg mercury and ammonium, respectively, that have serious effects on skin.⁴² There have been many reports about the lack of rules and regulation for manufacturers of cosmetic items in Pakistan, yet the public continues to expose themselves to carcinogenic ingredients in personal-care products like shampoo, soaps, surma, and lipstick. Table 3 summarizes commonly used cosmetic items and their adverse consequence on consumer health.

Topical Steroids and Bleaching Creams

In Pakistan, different strategies and cosmetic materials are used for treatment and prevention of aging and to keep the skin toned. Most cosmetic items contain hydroquinone, mercury, and vitamin C as functional ingredients for bleaching and antiaging purposes.⁸ According to a study on the magnitude of both topical steroid and whitening-cream abuse in steroidal rosacea patients, 33% were using potent topical steroids and 17% patients whitening creams exclusively, while the other 50% were using topical steroids in combination with various whitening creams that base the steroidal dermatitis.⁵⁵

Cosmetics and Cancer

Cosmetic products and increased cancer risk are subjects of controversy nowadays, eg, associations between parabens and breast cancer, hair dyes and hematologic malignancies, and talc powders and ovarian cancer. According

to the Center for Food Safety and Applied Nutrition Adverse Event Reporting System database, there are nine unique cancers associated with hair products, of which only chronic lymphocytic leukemia, lung cancer, and breast cancer have been reported in the literature.⁵⁶ Due to their chemical similarity to asbestos, talc products cause ovarian cancer in occupational settings and through migration of talc to the ovaries through the vagina. It is estimated that 14% of women with ovarian cancer have some talc exposure, while skin moisturizers make up only 10.5% of total cancer cases.⁵⁷ Many studies have proved the role of parabens, used as preservatives in cosmetics, in breast cancer.^{58–60} Exposure to hair dyes increases the chances of leukemia, non-Hodgkin's lymphomas, and bladder cancer.^{60–63} In another study, it has been reported that personal use of darker hair dyes and relaxants are involved in estrogen receptor-positive and estrogen-receptor breast cancer.⁶⁴ Moreover, the use of other hair products has a significant correlation with cancer risk factors. In 2011, the FDA issued warning letters to designers of a certain heated hair treatment, Brazilian Blowout, due to the release of formaldehyde with heat. Formaldehyde is a known carcinogen associated with lung and hematologic

malignancies.^{65–67} Figure 2 shows the association of hair-coloring products with different cancers.

Research has revealed that there is an increased chance of cancer after exposure to genotoxic metals, such as chromium VI, cobalt, and nickel, in cosmetic products.^{68–73} In other studies, heavy metals, such as lead, cadmium, and chromium, in pigments of lipstick, eye shadow, lip makeup, and face powder may lead to cancerous and noncancerous effects on human health.^{70,74} Use of commercially available moisturizing creams increases the chances of tumor formation when applied topically to UVB-pretreated high-risk mice.⁷⁵ It has been found that cosmetic and fragranced products pose high risks of breast cancer and other illnesses.⁷⁶ Due to body-care cosmetics' role in breast cancer incidence, consumers should adopt precautionary principles about these products (including moisturizers, creams, sprays, or lotions applied to axilla, chest, or breast areas). Oncologists have great concern for consumers of such toxin-contaminated personal-care items, and they are trying to uncover possible mechanisms involved in the carcinogenic effects of cosmetics. To deal with this association of cancer risks and personal-care products, there must be better and broader

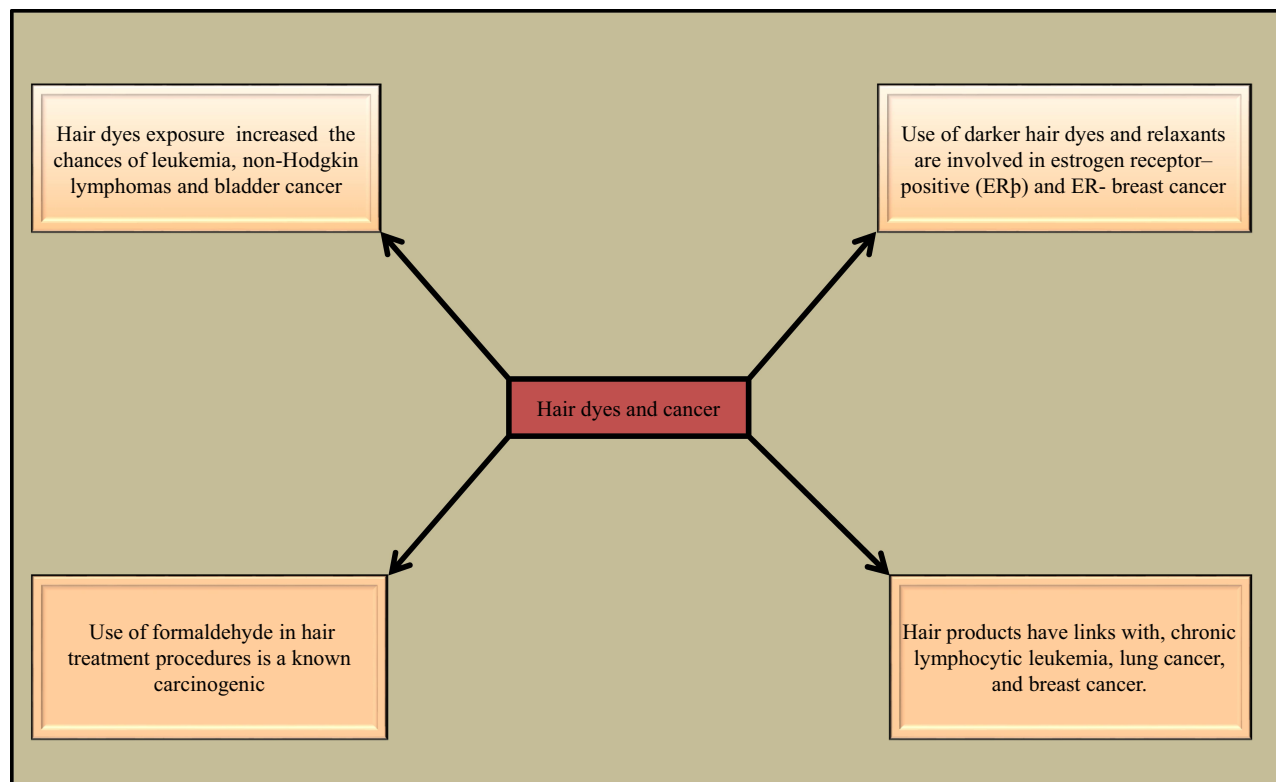


Figure 2 Associations between hair-coloring products and cancer risks. The Hair-dye ingredients increase the risks of different cancer types, such as leukemia, lung, breast, and skin.

data collection that can highlight the emerging concerns and direct scarce regulatory resources toward promoting public safety and relieving consumer fears.

Cosmetics and the Environment

Detrimental ingredients in cosmetics not only affect consumer health but are also a burden on the environment and consequently all life. Most lethal ingredients, ie, parabens are used to increase the shelf life and quality of cosmetics. There is great concern about the presence of these parabens released from cosmetic vials in the open environment and their postuse processing by the plastics industry into drinking water and the air (dust).^{77–79} The major source of this ubiquitous occurrence of parabens in the environment is wastewater-treatment plants.⁸⁰ This postuse mixing of cosmetic ingredients is very alarming, as they pose potential problems to aquatic life and human after being deposited in bodies of water.⁸¹ Cosmetics with high mercury content are eventually discharged into wastewater after usage, and mercury becomes methylated and enters the food chain in the form of methylmercury, which is highly toxic to fish. Pregnant woman who consume fish containing methylmercury transfer the mercury to their fetuses, which leads to neurodevelopmental and other illnesses in the children.^{82,83} Due to its undegradable nature, plastic packaging of cosmetics also plays a substantial role in poisoning our ecosystem. According to recent estimates, 600 million plastic bags, including cosmetic plastics, are used each hour in the world.⁸⁴ According to research from Karachi University, commonly used nonstandard cosmetic products comprise such chemicals as oxalic acid, sodium picramate, and titanium dioxide, textile dyes, carcinogenic substances, highly volatile organic solvents (camphor and terpineol) and other heavy metals, eg, lead, chromium and nickel. Excessive use of these products has the potential to damage consumer health and cause accretion of toxic metals in the environment.⁸⁵

Cosmetic Regulation in Pakistan

Pakistan is one of several countries that needs to modernizing its drugs and cosmetic products in this climate of global change. Presently, there do not seem to be effective checks and balances in place, and specific regulations on standards for chemicals (like mercury) in consumer products, including cosmetics and skin-whitening creams, are much needed. Many official government-institute reports and scientific papers have appealed to the government of Pakistan to take the

necessary steps toward regulation of cosmetic products in the country. As a signatory to the Minamata Convention on Mercury and with a growing network of unauthorized, illegally marketed cosmetic products, the government of Pakistan is working hard to achieve objectives to streamline authorization of a pure-cosmetic supply chain in the market. Pakistan is trying to strengthen relevant institutes like the Pakistan National Accreditation Council, Pakistan Standards and Quality Control Authority (PSQCA), Drug Regulatory Authority of Pakistan to implement a quality-management system for regulation of the manufacture, import, sale, and distribution of all cosmetic products. The Ministry of Science and Technology has issued a law to regulate skin creams all over Pakistan through the PSQCA, whereby a special task force will check manufacturing units, markets, and stores to highlight substandard cosmetics and take strict legal action.⁸⁶ Authorities have started the cancellation of licenses and sealing manufacturing unit whose products do not meet the standards of the PSQCA.⁸⁷ Furthermore, the Punjab government has approved a Drug and Cosmetics Amendment Act by which all cosmetic-sale points will need to be licensed for the provision of genuine products through the original supply chain.⁸⁸

With some amendments as necessary to take account of regulations as per the requirements of the country, Pakistan is in urgent need of adopting the most reliable model on regulation — that of Cosmetics Europe. This represents the European cosmetic industry, and has developed new requirements and guidelines to promote consistent procedures for the management of reporting serious undesirable effects from the use of personal-care cosmetic products to competent authorities.^{89,90} These guidelines are mutual outcomes of discussions with international competent authorities, industry, and other interested parties in the market-surveillance sector.⁹¹ Following these guidelines, an appropriate management system will be set up to phase out all illegal brands from the market and thus fulfill legal obligations under cosmetics regulations, take responsibility for cosmetic products, and ensure that appropriate action can be taken. At present, these guidelines are an evolution of earlier industry guidelines on the management of cosmetic-industry products to become free of harmful ingredients.

Recommendations

There is a dire need for combined action by all relevant and responsible stakeholders, including the government, to monitor and keep strict checks and balances on manufacturers of local and imported cosmetic products in the country. The lethality of these toxic cosmetic products is a public problem, and there is a need to raise awareness among all consumers. There is an effective and broad role to be played by all electronic and print media in changing misleading and outdated concepts of attractiveness, appeal, and, beauty.

All consumer products need to be have proper labels (mandatory), clearly indicating the amount of chemicals added to the products, with updated contact information for the manufacturers. Consumer products containing excessive amounts of chemicals need to be banned for use/sale/manufacturing, and strict rules should be there to discourage manufactureres from playing with lives. There

should be strong decisions by consumer courts to regulate ingredient labeling on each product. People should avoid purchasing foreign brands if the ingredients are not printed in English. To improve the appearance of aged skin, products of good brands recommended by dermatologists should be used, and dermatologists must analyze anatomical variants and hormonal and genetic factors related to aging. There must be rules for advertising approved cosmetic products. Environmental protection agencies may also be involved, in view of environmental pollution caused by chemical use and resulting release/waste. It is also recommended that the Higher Education Commission looks into MBBS syllabi/curricula for needed additional information about cosmetics, especially skin-whitening creams, to be included for dermatology specialization. [Figure 3](#) shows directions to protect consumers from the effects of hazardous, unauthorized personal-care cosmetic products.

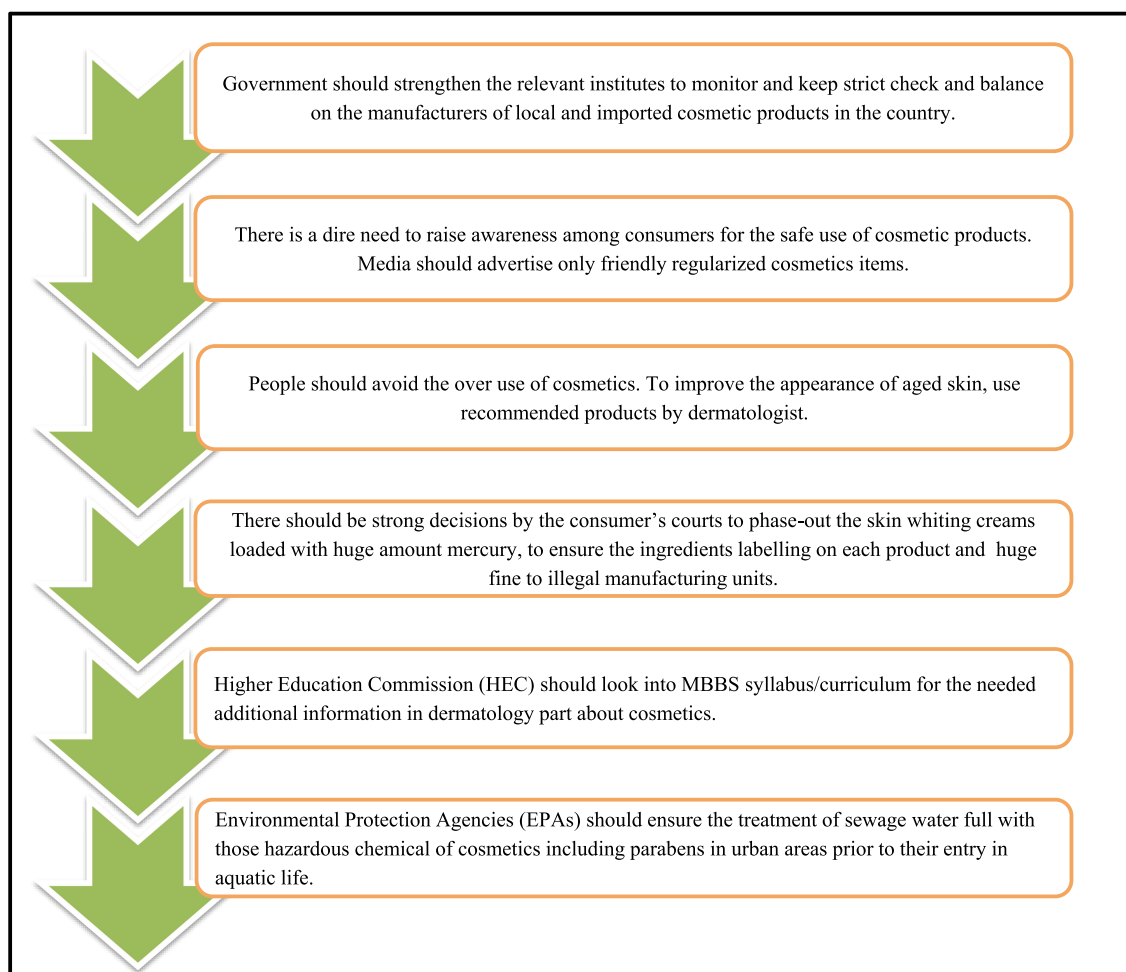


Figure 3 Directions to save cosmetic consumers from the effects of hazardous, unauthorized personal-care cosmetic products.

Conclusion

Low-quality, unauthorized cosmetic products have adverse effects on consumer health and cause serious medical complications. Due to the open availability of illegally manufactured cosmetic items at local stores, a large portion of the Pakistani population — both men and women, urban and rural — has been severely affected with facial skin damage and other clinical health issues. People have no knowledge about associations of ingredients with skin rupture, carcinogenesis, or multiorgan failure. They are exposing themselves to toxic chemicals continuously and unknowingly in the pursuit of beauty. There is an urgent need to address the problems highlighted and employ checks and balances in the country to thoroughly evaluate and regulate all personal-care cosmetic products prior to their marketing. The general public must be aware of the consequences of buying unauthorized, toxic cosmetics, and the government should ensure a standard supply chain into markets with safety data for all local and imported items.

Data-Sharing Statement

All the data used in this review have been presented in the main text as either tables or figures. Additional requests for the data can be made electronically. Please email kakakhan3514@gmail.com

Ethics Approval

Not applicable.

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Disclosure

The authors declare that they have no conflicts of interest for this work.

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