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UNVELLING THE DANGERS OF HARMFUL SKINCARE PRODUCTS: A COMPREHENSIVE REVIEW

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ABSTRACT

The word 'cosmetics' is taken from a Greek word "kosmeticos" which means to adorn. Since early days materials used for beautification or improvement of appearance comes under the category of cosmetics. People want to look beautiful and the concept of cosmetics is as old as mankind and civilization. The urge to beautify one's own body and look beautiful has been an urge in the human race since the tribal days. Assorted beauty products such as skincare products, hair products, fragrances, oral hygiene, and nail products, which may contain toxic chemicals that can be harmful to health are used especially by women. Since long time cosmetics have been known to enhance the appearance of the human body. In a society obsessed with beauty, people are lured to fake their appearance as a cure for their insecurities. The estimated value of cosmetic industry today is around 20 billion dollar globally. As a consumer, we are constantly attracted to using beauty and personal care products. But these products, which are supposed to make us feel healthy and look beautiful, have a deep dark side. Various toxic ingredients and hazardous chemicals used in cosmetics are incorporated in beyond acceptable limits. These chemicals may cause serious ill effects on skin and may also enter the skin and other organs causing carcinogenicity. Cosmetics have not only seeped into the fashion world but are also playing a prominent role in one's day-to-day life. Thus, it becomes a necessity to make people aware of the various harmful effects of cosmetics and chemicals used in cosmetics.

INTRODUCTION

The use of skin care products is becoming more popular in China because of increased attention to beauty and health, as well as improvements in economic conditions. Meanwhile, the incidence of adverse cutaneous reactions to skin care products is also increasing, particularly over the last five years. Moreover, recent studies indicate that even branded skin

care products can cause severe adverse cutaneous reactions. While eczematous reactions account for 90% of these adverse reactions, a link between skin care products and an increased risk of breast cancer has been observed. The types of adverse cutaneous reactions to skin care products vary with the products. For example, certain skin care products can cause stinging and erythema within 30 min after topical application Notably, evidence on adverse reactions to skin care products is from various case reports. Accordingly, the clinical characteristics of adverse cutaneous reactions to skin care products, particularly on the face, have not yet been systematically characterized. In addition, it is unknown whether adverse cutaneous reactions to skin care products vary with age and gender. In the present study, we characterize the clinical and demographic features of 223 Chinese patients with adverse skin facial cosmetics.

While long-term use of anti-aging products that contain retinol and ascorbic acid can induce facial xerosis. Use of skin whitening formulations, such as hydroquinone-containing products, can induce acne-like lesions, eczema and irritant contact dermatitis Moreover, hydroquinone–containing products can ind Notably, evidence on adverse reactions to skin care products is from various case reports. Accordingly, the clinical characteristics of adverse cutaneous reactions to skin care products, particularly on the face, have not yet been systematically characterized. In addition, it is unknown whether adverse cutaneous reactions to skin care products vary with age and gender. In the present study, we characterize the clinical and demographic features of 223 Chinese patients with adverse skin facial cosmetics. Uce ochronosis mostly in patients with dark skin. Likewise, induction of burning and erythema by other depigmenting agents, such as azelaic acid and kojic acid, has also been documented. Even skin care product-induced toxic epidermal necrolysis has been reported. Finally, recent studies have demonstrated that certain infant skin care products can compromise epidermal functions, including epidermal permeability barrier, stratum corneum hydration and stratum corneum pH in murine skin, while potentially inducing contact dermatitis in humans.

Notably, evidence on adverse reactions to skin care products is from various case reports. Accordingly, the clinical characteristics of adverse cutaneous reactions to skin care products, particularly on the face, have not yet been systematically characterized. In addition, it is unknown whether adverse cutaneous reactions to skin care products vary with age and

gender. In the present study, we characterize the clinical and demographic features of 223 Chinese patients with adverse skin facial cosmetics.

METHODS

A throught lilterature search was conducted using various Databases, & including PubMed Google Scholor, to identify relevant studies, Articles, and Reports.

The search terms included “Harmful skincare products” toxic ingredients in skincare” and adverse effects of cosmetics only peer-reviewed articles published within the last ten years were included to ensure up-to-date information.

1. **Harmful skincare products**

1) “**The dark side of skincare:** Harmful ingredients to avoids – This article provides on overview of common harmful ingredients fonud in skincare products, such as paraben, sulfates & synthetics fragrances. It discusses the potential health risks associated with these ingredients and offers tips on how to identify and avoid them.
2) **Toxic beauty:** The Hidden dangers of skincare product’ – This review delves into the hidden dangers of popular skincare products, highlighting the presence of toxic chemicals like phthalates and formaldehyde releasing preservatives ingridents label and opting for safer alternatives.
3) **The ugly truth:** Harmful effects of skincare products on the Envirnoment” This article sheds light on the environmental impact of certain skincare products particularly those containing microplastics and chemical sunscreens to polluation and damage marine ecosystems
4) "**Skincare ingredients to steer clear of**" - This comprehensive review provides an in-depth analysis of harmful skincare ingredients, including parabens, phthalates, and mineral oil. It explains the potential health risks associated with each ingredient and offers recommendations for safer alternatives.
5) **"The price of beauty:** The Health Risks of Common Skincare Products" - This review focuses on the health risks posed by common skincare products, such as skin irritation, allergic reactions, and long-term effects on hormone balance. It also provides insights into the lack of regulation in the skincare industry.
6) **"Clean beauty:** A Guide to Safer Skincare Products" - This article offers a guide to choosing safer skincare products by avoiding harmful ingredients like artificial colors,

synthetic fragrances, and formaldehyde-releasing preservatives. It highlights the importance of clean beauty and provides recommendations for natural alternatives.

7) **"Skincare ingredients that can damage your skin barrier**" - This review explores how certain skincare ingredients, such as alcohol, harsh exfoliants, and fragrances, can damage the skin barrier, leading to dryness, sensitivity, and inflammation. It suggests alternatives that promote a healthy skin barrier.
8) **"The dangers of skin whitening products**" - This article discusses the harmful effects of skin whitening products that often contain ingredients like hydroquinone and mercury. It highlights the potential risks to skin health and overall well-being and advocates for embracing natural skin tones.

2. *Toxic ingredients in skincare*

There are several toxic ingredients that are commonly found in skincare products. These ingredients can potentially harm your skin and overall health. Here are some of the most concerning toxic ingredients:

1) **Parabens:**
2) **Phthalates:**
3) **Sodium lauryl sulphate (SLS):**
4) **Formaldehyde:**
5) **Synthetic fragrances:**
6) **Mineral oil:**
7) **Triclosan:**
8) **Oxybenzone:**
9) **Coal tar:**
10) **Toluene**

Parabens

These are preservatives commonly used in skincare products to prevent the growth of bacteria and mold. However, they have been linked to hormone disruption and can mimic estrogen in the body.

Parabens are a group of chemicals commonly used as preservatives in skincare products, cosmetics, and personal care items. They have been widely studied and have raised concerns due to their potential health effects.

Research has shown that parabens can mimic estrogen in the body, leading to hormone disruption. Estrogen is a hormone that plays a crucial role in the development and function of reproductive organs. Studies have found that parabens can bind to estrogen receptors, potentially disrupting normal hormonal balance.

One study published in the Journal of Applied Toxicology in 2004 detected parabens in breast tumors, suggesting a possible link between paraben exposure and breast cancer. However, it is important to note that this study did not prove causation, and further research is needed to fully understand the relationship between parabens and cancer.

Another concern with parabens is their potential to cause skin irritation and allergies. Some individuals may experience allergic reactions or dermatitis when using products containing parabens.

Despite these concerns, regulatory bodies such as the U.S. Food and Drug Administration (FDA) and the European Union's Scientific Committee on Consumer Safety (SCCS) have deemed parabens safe for use in cosmetics at current levels. However, some countries have taken steps to restrict or ban certain types of parabens in cosmetic products.

Phthalates

Phthalates are a group of chemicals commonly used as plasticizers to make plastics more flexible and durable. They can be found in a variety of products, including cosmetics, personal care products, toys, and food packaging.

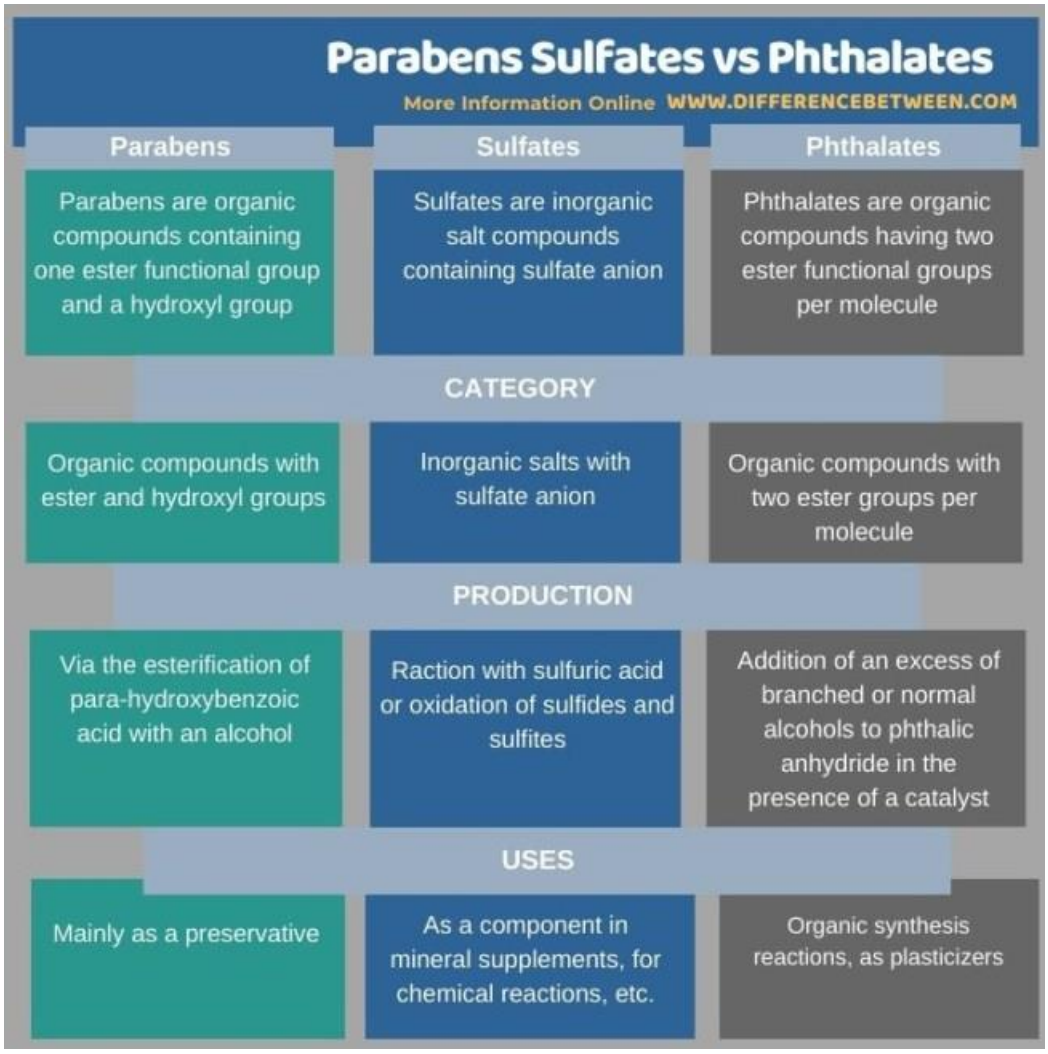
Similar to parabens, phthalates have raised concerns due to their potential health effects. Research has shown that phthalates can disrupt the endocrine system and interfere with hormone function. They have been linked to reproductive and developmental abnormalities, such as reduced sperm count, genital malformations, and early puberty in both males and females.

Phthalates can also be absorbed through the skin and have been detected in human urine, blood, and breast milk. Some studies have suggested a possible association between phthalate exposure and increased risk of certain health conditions, such as asthma, allergies, and obesity. However, more research is needed to fully understand the long-term effects of phthalate exposure on human health.

Regulatory bodies, such as the FDA and the European Chemicals Agency (ECHA), have implemented restrictions on the use of certain phthalates in certain products. For example, the use of certain phthalates in children's toys and childcare articles is banned in the European Union.

To reduce exposure to phthalates, individuals can choose products labeled as phthalate-free or opt for natural and organic alternatives. It is also advisable to avoid using plastic containers or bottles that may contain phthalates, especially when storing or heating food.

In conclusion, while phthalates have been associated with potential health risks, further research is needed to fully understand their impact on human health. It is important to stay informed about potential harmful ingredients in products and make informed choices to minimize exposure.



Paraben: Any of a group of compound used as preservatives in pharmaceutical and cosmetic products and in the food industry.

Phthalates: A group of chemicals used to make plastics more durable it's surprising that chemicals and plastic would translate to personal care products Phthalates also function as solvents and stabilizers in perfumes and other fragrance preparations. Cosmetics that may contain phthalates include nail polishes, hair sprays, aftershave lotions, cleansers, and shampoos.

Sodium Lauryl Sulphate (SLS)

Sodium lauryl sulfate (SLS) is a surfactant commonly used in many personal care and cleaning products. It is known for its ability to create foam and lather, which is why it is often found in products like shampoos, body washes, toothpastes, and dish soaps.

SLS works by reducing the surface tension of water, allowing it to mix more easily with oils and dirt. This helps to remove dirt, grease, and other impurities from the skin, hair, or surfaces being cleaned.

While SLS is effective at cleansing, it has also raised some concerns regarding its potential health effects. Some individuals may experience skin irritation or allergic reactions when using products containing SLS. This can include symptoms such as redness, itching, or dryness of the skin.

There have also been claims that SLS can cause more serious health issues, such as cancer. However, there is currently no scientific evidence to support these claims. Regulatory bodies, such as the FDA and the Cosmetic Ingredient Review (CIR) Expert Panel, have deemed SLS safe for use in cosmetics and personal care products when used in accordance with established guidelines.

It is important to note that individual sensitivities and allergies can vary, so some individuals may choose to avoid products containing SLS if they experience adverse reactions.

Formaldehyde

This is a known carcinogen and is commonly used as a preservative in skincare products. It can cause skin irritation, allergies, and respiratory issuIt certainly is not safe when it comes to its use in skincare. Aside from the fact that formaldehyde has some very dangerous side

effects (more on that in a minute), it's a known irritant. Easily absorbed through the skin and eyes, it can cause severe irritation and burns in skin and even loss of vision in the eyes. Make Sure You're Aware of Formaldehyde Releasers As we said above, finding formaldehyde releasers in your skincare can be trickier than finding formaldehyde, because most people don't know what they're called. Here is a short list of formaldehyde releasers you should be aware of (and keep in mind–these are just the formaldehyde releasers that appear in skincare and cosmetics. There are others that are used in industrial products, like plywood):

- Benzylhemiformal
- 2-bromo-2-nitropropane-1,3-diol
- 5-bromo-5-nitro-1,3-dioxane
- Diazolidinyl urea
- DMDM hydantoin
- Formaldehyde
- Glyoxal
- Imidazolidinyl urea
- Methenamine
- Paraformaldehyde
- Polyoxymethylene urea
- Sodium hydroxymethylglycinate
- Quaternium-15

Synthetic fragrances

Can contain numerous undisclosed chemicals, including phthalates, which can cause allergic reactions and skin irritation.

The increased Fragrances concentration of fragrances and fragranced-associated VOCs in the indoor air may cause adverse cutaneous, respiratory, and systemic effects such as headaches, asthma attacks, breathing difficulties, cardiovascular and neurological problems, mucosal irritation, and contact dermatitis, as well as distresses.

Mineral oil

Derived from petroleum, mineral oil forms a barrier on the skin's surface preventing moisture loss but also clogging pores it can lead to acne breakouts and other skin issues like acne or blackheads.

Most emollients can be used safely and effectively with no side effects however, burning, stinging, redness, or irritation may occurs.

Before using this product tell your docter or pharmacist if your allergics this product may contain inactive ingredients, which can cause allergic reactions or other problems.

Triclosan

This antibacterial agent is found in many skincare products, including soaps and cleancers It has been linked to hormone disruption, antibiotic resistance, and environmental concerns.

One study described the role that triclosan may have in developing allergics and sensitivities to certain products containing the ingredients cause skin irritation triclosan is an endocrine disrupting chemical that means it can harm your endocrine system leading to issues with proper hormone function.

Oxybenzone

This chemical is commonly found in sunscreens and can penetrate the skin potentially disrupting Oxybenzone is also known to cause allergic reactions in some people, although this is not common.

Even if you avoid sunscreens with oxybenzone, you may encounter it in other products, including plastic, hairspray, and nail polish hormones and causing allergic reactions.

Coal tar

Used in some anti -dandruff shampoos and psoriasis treatments coal tar contains carcinogenic compounds that can be harmful when absorbed through the skin.

Toluene

This solvent is often found in nail polishes and hair dyes it has been linked to reproductive harm developmental issues to reproductive harm developmental issues and respiratory problem.

Common cosmetics Products and Associated toxicities

Skin lightening angents

Hydroquinone (HQ) a skin lightening agent has been indentified as one of the most dangerous substances. Reports of ochronosis and possible mutagenicity have been discovered

ochronosis is a rate HQ side effect. Characterized by a gradual darkening of the region to which a cream containing high concentrations of HQ has been administered for many years. Hydroquinone is a hydroxyphenolic chemical that suppresses the manufacture of melanin by blocking the tyrosinase enzyme.

Sunscreen prodcuts

Sunscreens can induce irritating, allergic, phototoxic, or photoallergic responses in certain people. Benzophenones are the most prevalent sensitizers. Photoallergic dermatitis can be caused by debenzoyl methanes, paraaminobenzoic acid (PABA), and cinnamates. The scent or other chemicals are responsible for the majority of allergy responses associated with deodorants/antiperspirants and perfumes.

Shampoo

Shampoos and conditioners have relatively little contact time with the skin; they are solely administered to the hair and, as a result, have fewer side effects. The issue occurs, however, when they come into touch with the eyes when washing the hair. The most common side effect of shampoo is matting of the scalp hair, commonly known as hair tangling. Another aspect to consider is the shampoo's pH. The majority of shampoos have an alkaline pH, which promotes hair shaft swelling and potential damage. For chemically treated hair from permanent colouring or permanent waving, a shampoo with a neutral pH is the best option. A thorough analysis of verified data on the incidence of contact allergies to shampoo revealed that the danger was minimal.

The beginning of complications due to the use of cosmetics

Egyptians' use of coloured lead-based cosmetics has been described as the first indication of cosmetics usage and problems. Following that, rouges and lipsticks with a crimson tint were created, which were linked to mercury sulphide. When eaten by pregnant women, this chemical induced spontaneous miscarriage. Arsenic, which was employed by Greeks and Romans in chemical depilatory treatments, was another hazardous substance capable of inflicting harm to the organism.

The pharmaceutical companies began to invest in novel active principles and vehicles for the manufacturing of cosmetics as knowledge about the physiology of skin and its components advanced. As a result, new quality control tests in the manufacturing of such cosmetics must be updated in order to assure the safety of their usage.

The cosmetic Risk and Public health

The danger to one's appearance as well as the public's health as the usage of cosmetic goods grows, as does the population's exposure to the chemical components for longer periods of time and more often, the adverse effects of these products become more common. Women and men all around the globe use a lot of cosmetic items in the quest for eternal youth, despite the potential health hazards. Cosmetic compounds are also pollution precursors. Their environmental monitoring is still in its infancy. However, they are known to enter the environment through a variety of routes, including water, posing health hazards to marine and freshwater ecosystems as well as humans.

Possible health complications associated with the use of cosmetics

Cosmetic goods have the potential to produce side effects because to the inclusion of various components in their composition, and the consequences might range from a minor hypersensitivity reaction to an allergic reaction or even fatal overdose. Cosmetics can produce a wide range of negative responses. Type IV hypersensitivity, contact urticaria, photosensitization, pigmentary disorders, hair and nail damage, paronychia, acneiform eruptions, folliculitis, and aggravation of an existing dermatosis are all possible side effects. Cosmetic items can have negative side effects. the following are some of the health risks connected with the usage of cosmatics:

A) Allergic reactions to cosmetics:
B) Irritant contact dermatitis:
C) Photoallergic Dermatitis:
D) Facial stinging:
E) Redness

Chemicals in skin care products harmful for children

Personal care products may send one child to the hospital every two hours: US study Personal care products like shampoo, lotion, nail polish and cologne may send one child to the hospital every two hours due to poisoning and chemical burns, according to a US study published.

Researchers at the Nationwide Children's Hospital found that 64,686 children younger than five years of age were treated in US emergency departments for injuries related to personal care products from 2002 through 2016.

The study, published in the journal Clinical Pediatrics, found that most injuries from these products occurred when a child swallowed the product (75.7 per cent) or the product made contact with a child's skin or eyes (19.3 per cent).

These ingestions and exposures most often led to poisonings (86.2 per cent) or chemical burns (13.8 per cent), researchers said.

"When you think about what young children see when they look at these products, you start to understand how these injuries can happen," said Rebecca McAdams, a senior research associate at Nationwide Children's Hospital.

"Kids this age can't read, so they don't know what they are looking at. They see a bottle with a colourful label that looks or smells like something they are allowed to eat or drink, so they try to open it and take a swallow.

"When the bottle turns out to be nail polish remover instead of juice, or lotion instead of yogurt, serious injuries can occur," McAdams said.

The top three product categories leading to injuries were nail care products (28.3 per cent) hair care products (27.0 per cent), and skin care products (25.0 per cent), followed by fragrance products (12.7 per cent).

Nail polish remover was the individual product that led to the most number of visits to the emergency room (17.3 per cent of all injuries).

Of the more serious injuries that required hospitalisation, more than half were from hair care products (52.4 per cent) with hair relaxers and permanent solutions leading to more hospitalisations than all other products.

Keeping children safe around cosmetics

When we think about household products that need to be kept out of the reach of small children, we usually think about medications and cleaning products. We don't usually think about cosmetics. But a study published in the journal Clinical Pediateics shows that we need to think about cosmetics too.

How many childhood injuries are due to cosmetics?

Researchers used the National Electronic Injury Surveillance System to look at data about children younger than 5 who were treated in US emergency departments for cosmetics-related injuries between 2002 and 2016.

They found that in that time period, almost 65,000 children went to the emergency department because of a cosmetics-related injury. That's a little more than 4,000 every year. About 60% of children injured were younger than 2, and 40% were ages 2 to 4. The vast majority suffered minor injuries. Only 6.4% (about 1 in 15) needed to be hospitalized. Not surprisingly, children younger than 2 were most likely to be hospitalized. There were no fatalities.

MATERIALS AND METHODS

Different kinds of beauty and hygiene products were selected between October and November 2017 from various shops in Lecce (Italy), mainly supermarkets with nationwide coverage, beauty shops, and pharmacies as well as online shops. Ingredient information from

labels was collected by taking photos in the shops or downloading data sheets from webshops. Because of the lack of available data on sales rates of specific products to the public, as in other studies,[11] a crude selection of products estimated to be sold in large volume was made, on the basis of information from shop assistants and the authors' own perceptions.

All products were divided into 3 categories: rinse-off products (shower gel, shampoo, toothpaste, liquid soap, intimate soap, shaving foam) leave-on products (body cream, face cream, hand cream, deodorant, sunscreen, aftershave) and make-up ones (lipstick, lipbalm, foundation, nail polish). Such a classification was based on the time of skin application: rinse-off products stay a very short time on it, as they are usually rapidly washed away (even if it would also be appropriate to consider the frequency of application); leave-on and make-up products stay longer on the skin, but the former are more usually used for skin care, in order to protect it, perfume it and keep it in good conditions (moisturising, nourishing, tonifying, etc.), the latter have an aesthetic purpose and are intended to improve someone's look.

Every group included also organic and children's products. The first were identified on the basis of organic and natural certifications disclosed on the brand's website and indicated on the label (Cosmos, Ecolabel UE, Ecocert, Icea, Natrue, etc.); the latter showed on the label the word "baby" or "kids".

Subsequently, the label of every product was examined and chemicals which could possibly affect human health were detected. The selection of substances was based on scientific evidence: for fragrances the list of 26 allergens which have been identified as skin sensitizer by the Scientific Committee on Consumer Safety (SCCS) and whose names should be listed on the label[12] was considered; for the other substances a literature's review was conducted[13-15] and only those reporting possible harmful effects on human heath were selected.

A list with fragrances, preservatives and other chemicals of concern, including some UV filters, antioxidants, emulsifiers, surfactants and other synthetic compounds, was created. Data were recorded in Microsoft® Excel and analyzed by calculating rate, median and maximum of substances for every category. No chemical analyses were performed in the present study.

RESULTS

A total of 283 products were examined: 112 rinse-off, 103 leave-on and 68 make-up (Tab. I). Fragrances individuated on the labels were 19, preservatives were 16 and other chemicals of concern were 11.

Tab. I

Products divided into rinse-off, leave-on and make-up categories with frequency of occurrence and proportion of products containing fragrances, preservatives and other chemicals of concern and their distribution in term of median and maximum.

Fragrances

The 19 fragrances individuated (Tab. II) are all included in the list of 26 allergens redacted by SCCS, whereas the missing seven ones were: amylcinnamyl alcohol, anise alcohol, benzyl cinnamate, cinnamal, evernia furfuracea, evernia prunastri, methyl 2-octynoate. More than fifty-two per cent of the products contained at least one of the fragrances investigated, especially rinse-off products (61.6%). Generally, the most frequently identified fragrances were limonene (76.9%), linalool (64.6%), citronellol (34.1%), geraniol (31.5%), coumarin (30%) and hexyl cinnamal (29.2%). Moreover, limonene was more present in rinse-off (70.7%) and make-up products (73.3%), whereas linalool was more found in leave-on ones (87.7%).

Tab. II: Frequency of occurrence and percentage of fragrances identified on the label of selected products and referring to rinse-off, leave-on and make-up categories.

Fragrances	CAS no.	Rinse-off		Leave-on		Make-up		Total	
		(n)	(%)	(n)	(%)	(n)	(%)	(n)	(%)
Alpha-isomethyl ionone	127-51-5	6	10.3	22	38.6	4	26.7	32	24.2
Amyl cinnamal	122-40-7	3	3.2	3	5.3	1	6.7	7	5.4
Benzyl alcohol	100-51-6	25	29.4	25	32.5	5	17.2	55	28.8
Benzyl benzoate	120-51-4	3	3.2	9	15.8	4	26.7	16	12.1
Benzyl salicylate	118-58-1	12	20.7	20	35.1	1	6.7	33	25.4
Butylphenyl methylpropional	80-54-6	12	20.7	16	28.1	-	-	28	21.5
Cinnamyl alcohol	104-54-1	1	1.7	3	5.3	-	-	4	3.1
Citral	5392-40-5	2	3.4	26					

Preservatives

Sixty per cent of the selected products contained at least one of the preservatives investigated, above all among rinse-off products (75%). The most frequently identified preservatives (Tab.

IV) were phenoxyethanol (48.7%), sodium benzoate (35.6%), potassium sorbate (22%), methylparaben (15.2%) and methylisothiazolinone/methylchloroisothiazolinone (MI/MCI) (9.9%). Sodium benzoate was the most common preservative in rinse-off products (57.6%) and phenoxyethanol in leave-on (70.1%) and make-up ones (58.6%).

Tab. IV: Frequency of occurrence and percentage of preservatives identified on the label of selected products and referring to rinse-off, leave-on and make-up categories.

Preservatives	CAS no.	Rinse-off		Leave-on		Make-up		Total	
		(n)	(%)	(n)	(%)	(n)	(%)	(n)	(%)
Methylparaben	99-76-3	8	9.4	16	20.8	5	17.2	29	15.2
Ethylparaben	120-47-8	2	2.4	11	14.3	3	10.3	16	8.4
Propylparaben	94-13-3	3	3.5	8	10.4	4	13.8	15	7.9
Butylparaben	94-26-8	-	-	4	5.2	2	6.9	6	3.1
Triclosan	3380-34-5	4	4.7	2	2.6	-	-	6	3.1
Imidazolidinyl Urea	39236-46-9	2	2.4	8	10.4	1	3.4	11	5.8
Diazolidinyl Urea	7849-02-8	-	-	-	-	1	3.4	1	0.5
5-bromo-5-nitro-1, 3 dioxane	30007-47-7	1	1.2	-	-	-	-	1	0.5
2-bromo-2-nitropropane-1, 3-diol	52-51-7	1	1.2	-	-	-	-	1	0.5
DMDM Hydantoin	6440-58-0	12	14.1	4	5.2	-	-	16	8.4
Phenoxyethanol	122-99-6	22	25.9	54	70.1	17	58.6	93	48.7
Methylisothiazolinone/ Methylchloroisothiazolinone	2682-20-4, 26172-55-4, 55965-84-9	19	22.4	-	-	-	-	19	9.9
Chlorphenesin	104-29-0	1	1.2	2	2.6	2	6.9	5	2.6
Benzoic acid	65-85-0	5	5.9	9	11.7	1	3.4	15	7.9
Sodium benzoate	1-23-235	49	57.6	17	22.1	2	6.9	68	35.6

Four different parabens were identified (methylparaben, ethylparaben, propylparaben, butylparaben) and almost 15% of the products contained one or more parabens, mostly leave-on products (face and hand cream, sunscreen, aftershave). The most detected was methylparaben, found in all of those products containing at least one paraben, followed by ethylparaben (55.2%) and propylparaben (51.7%). All four parabens were contained in six products (foundation, face cream, lipstick, aftershave, two sunscreens) and three parabens in three products (aftershave, two face creams).

Formaldehyde-releasers (imidazolidinyl urea, diazolidinyl urea, 5-bromo-5-nitro-1, 3 dioxane, 2-bromo-2-nitropropane-1, 3-diol, DMDM hydantoin) showed almost the same rate of parabens (15%) but they were more present in rinse-off products. Among the five formaldehyde-releasers, the most common were DMDM hydantoin (53.6%) and imidazolidinyl urea (39.3%), which were both found also in two body lotions.

MI/MCI was found in 9.9% of the examined products, especially in rinse-off ones. Six products contained triclosan (3.1%) (two deodorants, two intimate soaps, a liquid soap, a shaving foam).

As far as children's products are concerned, more than seventy-two per cent contained at least one of the preservatives among those considered, in particular the most present was phenoxyethanol (43.8%), followed by sodium benzoate (37.5%). Formaldehyde-releasers were found into two products (shampoo, nail polish), parabens in a lipstick, chlorphenesin in a body cream and a shampoo, MI/MCI in two rinse-off products (shampoo, liquid soap) (Tab. III).

Almost fifty-four per cent of organic products showed on the label at least one of the preservatives investigated, in particular the most common was sodium benzoate (50%) followed by potassium sorbate (47.2%). It is notable the presence of triclosan in an organic deodorant.

Other chemicals of concern

Fifty-eight per cent of the examined products contained at least one of the other chemicals of concern, especially make-up ones (64.7%). The substances most frequently identified in this group (Tab. V) were PEGs (polyethylene glycols) (62.3%) and acrylate copolymer (34%). The first were more common in rinse-off (81.5%) and leave-on products (69.1%), while make-up ones showed a high presence of acrylates (45.2%) and petrolatum (33.3%).

Tab. V: Frequency of occurrence and percentage of other chemicals of concern identified on the label of selected products and referring to rinse-off, leave-on and make-up categories.

Other chemicals	CAS no.	Rinse-off		Leave-on		Make-up		Total	
		(n)	(%)	(n)	(%)	(n)	(%)	(n)	(%)
PEGs*	25322-68-3	53	81.5	38	69.1	10	23.8	101	62.3
Acrylate copolymer	25133-97-5	16	24.6	20	36.4	19	45.2	55	34
Petrolatum	8009-03-8	2	3.1	12	21.8	14	33.3	28	17.2
Polysorbate-80/-60/-20	9005-65-6, 9005-67-8, 9005-64-5	16	24.6	7	12.7	1	2.4	24	14.8
Ethylhextyl methoxycinnamate	5466-77-3	-	-	9	16.4	13	31	22	13.6
BHA	25013-16-5	1	1.2	-	-	2	6.9	3	1.6
BHT	128-37-0	3	3.5	14	18.2	11	37.9	28	4.7
Benzophenone-1	131-56-6	-	-	-	-	6	14.3	6	3.7

Benzophenone-3	131-57-7	-	-	3	5.5	5	11.9	8	4.9
Cocamide DEA	68603-42-9	2	3.1	-	-	-	-	2	1.2
Toluene	108-88-3	-	-	-	-	2	4.8	2	1.2

	Examined products	**Products containing fragrances**			**Products containing preservatives**			**Products containing other chemicals of concern**		
		N (%)	**Median**	**Max**	**N (%)**	**Median**	**Max**	**N (%)**	**Median**	**Max**
Rinse-off	112	69 (61.6)	2	10	84 (75)	2	6	65 (58)	2	5
Leave-on	103	61 (59.2)	6	15	64 (62.1)	2	7	55 (53.4)	2	7
Make-up	68	18 (26.5)	2.5	6	22 (32.4)	2	7	44 (64.7)	2	5
Total	283	148 (52.3)	3	15	170 (60)	2	7	164 (58)	2	7

DISCUSSION

The use of preservatives, surfactants, perfumes, stains, and other chemicals having preservative activity has risen as a result of today's innovation, research, and creation of new cosmetic goods. Such chemicals improve the quality, properties, and shelf life of cosmetic formulations; yet, frequent, prolonged, and indiscriminate exposure too many of these substances can be detrimental to human health. There are numerous agencies throughout the globe that govern the quality control, safety, and manufacture of cosmetic goods, and they are in charge of changing the standards and recommendations for the population's safe and healthy use of these products while reducing health hazards. However, there is no special institution that controls the costbenefit analysis and assurance of safety in the use of hazardous chemicals in cosmetic goods. Several aspects related to these side effects of cosmetics have been discussed in this paper.

CONCLUSION

The hazardous chemicals often found in cosmetic formulations may pose a health concern, and recurring adverse effects have been linked to them. Despite the fact that the different structures forthe regulation and quality control of cosmetics across the world are fairly complicated and extensive, they should be more stringent in the inclusion of new hazardous chemicals in the formulation of cosmetics to avoid harm to human health. It is important to apply an uniform cosmetovigilance throughout the world to stimulate improvements in the manufacturing, marketing, and usage of cosmetic goods by the general public. This public health approach is a legitimate way of getting information on the safety of cosmetic goods

and their components, avoiding the dangers connected with cosmetic use from becoming a major public health issue. According to scientific evidence, excessive levels of chemical preservatives, fragrances, and emulsifiers used in the production of cosmetic goods enhance side effects and health hazards via chemical and physical mechanisms. The health risks connected with cosmetic usage might range from a moderate hypersensitivity reaction to anaphylactic shock or even death from intoxication. In spite of clinical data presented in the literature, cancer is a problem linked with the use of cosmetics. Faced with the occurrence of side effects and the imminent occurrence of complications associated with the use of cosmetics, it is concluded that the quality control process in the manufacture of cosmetic products is ineffective in preventing health risks associated with the use of cosmetic products. There is more scope of future research in this field as there are large number of cosmetics products which are untouched from this perspective.

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