

*Review Article***Detrimental Effects of Perfumes, Aromas and Cosmetics*****Isha Gajbe, Maitreyee Ansingkar, Soumya Mathur, **Nikita Tomar******Assistant Professor, Department of Forensic Science, Sanjeev Agrawal Global Educational (sage) University, Bhopal (M.P.), Bhopal - 462026 (M.P.)****Article information****ABSTRACT****Volume: 1****Issue: 1****Page No: 32-48****Received: 02.04.2024****Accepted: 10.4.2024****Published: 26.05.2024****DOI No.:****Corresponding Author:**

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This research details the serious detrimental impacts of fragrances, aromatic chemicals, and cosmetics majorly associated with environmental and human health integrity. Despite being socially relevant and personal hygiene items, most of them comprise numerous synthetic substances, allergies, and endocrine disruptors that are highly hazardous to human health. Based on the in-depth analysis and review of studies showing the physical impact of volatile organic compounds and artificial fragrances with an association with respiratory problems, skin irritation, and hormonal imbalances, it also discusses mechanisms by which adverse health effects are caused, including sensitization pathways and long-term effects of cumulative exposure. In addition to health implications, this study also analyzes the effects of cosmetic products on the environment and the contribution that such cosmetic products make towards environmental pollution. The decomposition of microplastics and chemical run-off by cosmetics poses an important risk to aquatic life, biodiversity, and the quality of soil. The study thus attempts to clear up any risks that could be attached to ordinary cosmetic practices through information obtained both from toxicological evaluation and impact assessment studies on the environment. It highlights strong regulatory structures and the necessity for consumer awareness of such products' safety. Findings underpin both the urgent need to create and inspire a safer environment for cosmetics and promote greater holistic responsibility towards health and the environment.

INTRODUCTION

The appeal of perfumes, fragrances, and cosmetics in the last few years has captivated the world, promising not only beauty and confidence but also a way to express oneself. They have become an essential part of daily life and are embedded in cultural practices and social norms. However, beneath the fragrance and attractive packaging lies a complex web of chemical ingredients that pose a significant risk to human health and the environment. The fragrance industry operates with high opacity, and thus a great deal of synthetic compounds are imported into products; this may lead to various negative health effects, including allergic reactions, hormonal imbalances, and respiratory issues.

Most chemicals used in perfumes and cosmetics have been proved to be allergens, but they are also endocrine disruptors. Scientific studies have shown that chemicals affect the body's hormonal system. This means a serious impact on vulnerable populations such as children, pregnant individuals, and those with preexisting health conditions. The cumulative effect of exposure through daily use has long-lasting impacts on individual health, contributing to chronic diseases.

These are equally as disturbing as the environmental concerns of these products. Their production, packaging, and disposal into the environment also cause crucial environmental degradation; there is pollution of water, plastic, and biodiversity. Much of the chemicals applied have been proven not to degrade the environment but persist within such ecosystems to harm wildlife. The increasing consumer concern with the issue of sustainability has, in recent times, caused scrutiny within the beauty industry about the practices and the ecological footprint of these products.

The following research paper aims to highlight the harmful effects involved in the use of perfumes, fragrances, and cosmetics, with the ultimate message of an imperative revaluation of our consumerist behaviour and industrial requirements. We look at it from the health perspective and the ecological context while promoting awareness and advocating safer and more sustainable alternatives for the beauty and personal care industry. In conclusion, this work is to empower the consumer with knowledge that would enable informed choice while also demanding regulation and transparency from manufacturers. At a time when health and environmental sustainability are considered, the beauty industry has to change and innovate to meet

the conscious consumer demand for protecting individual well-being and the planet.^{[10][22][34][45][48]}

LITERATURE REVIEW

Perfumes, fragrances, and cosmetics seem to be widely used in today's culture, but there is growing evidence that suggests these products can have significant harmful impacts on human health as well as the environment. This consolidated review of recent literature aggregates research findings concerning their health implications, chemical composition, regulatory frameworks, and environmental effects.

The ill effects of synthetic fragrances and cosmetic components on health have been reported by many researchers. Michaels et al. (2020) presented a systematic review that has shown how VOCs, the primary organic compounds in most fragrance products, are associated with respiratory diseases such as asthma and COPD. The most vulnerable group is those with pre-existing respiratory diseases, and thus, there is a crying need for better formulation of the product and greater awareness amongst consumers. Sharma *et al.* (2021) while studying this in India mentioned the alarming incidence of skin problems, including contact dermatitis and allergic reactions, linked to commonly used cosmetic ingredients. Their study has identified allergens such as parabens and synthetic fragrances commonly employed in Indian

products, indicating that insufficient regulation and consumer knowledge contribute to the rising incidence of these conditions.

The presence of endocrine disruptors in cosmetics is another serious health concern. Gonzalez et al. (2021) explain the effects of endocrine disruptors, which can interfere with hormonal function and have been linked to reproductive health problems and certain cancers. Rao et al. (2022) specifically highlights the widespread use of products containing endocrine disruptors among women of reproductive age in India, emphasizing the urgent need for stricter regulatory oversight and public health interventions. Furthermore, a study by Desai et al. (2023) identified risks associated with long-term exposure to these chemicals, calling for comprehensive toxicological assessments to better understand their cumulative effects.

The complex chemical composition of personal care products often includes a myriad of synthetic compounds, raising safety concerns.

A study by Sharma *et al.* (2022) highlighted the prevalence of chemicals such as phthalates, parabens, and synthetic fragrances in cosmetic formulations. While many of these compounds are banned or restricted in countries with strict regulatory frameworks, Indian regulations, as outlined by the Bureau of Indian Standards (BIS), often lag behind global standards. This gap allows for the continued use of potentially

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harmful substances, necessitating a reassessment of existing safety regulations.

Kumar et al (2021) provide a comparative analysis of the regulatory framework in India, revealing challenges related to compliance and enforcement, particularly in labeling of allergens and hazardous substances. Lack of comprehensive labeling practices leads to consumer ignorance, exacerbating health risks. The environmental impact of cosmetic products is receiving increasing attention. Thompson et al.(2020) highlighted the ecological ramifications of microplastics derived from personal care products, which accumulate in aquatic environments, posing risks to marine biodiversity.

Singh et al (2023) found significant levels of microplastics in urban waterways in India, which were partly caused by cosmetics and personal care products. Furthermore, Pérez et al (2023) studied the contribution of chemical runoff from cosmetics to water pollution, focusing on rivers in India. Their results showed that ingredients such as parabens and sulfates can have significant impacts on aquatic organisms, leading to bioaccumulation and toxicity, highlighting the urgent need for sustainable practices in the cosmetics industry. Consumer awareness of the potential risks associated with the use of perfumes and cosmetics is important, especially in a rapidly urbanizing context like India.

Johnson and Lee (2023) found that many Indian consumers remain largely misinformed about the harmful effects of certain ingredients in their personal care products. This lack of understanding highlights the importance of educational initiatives to improve consumer understanding of ingredient safety.

Furthermore, a survey conducted by Gupta et al(2023) indicated that awareness campaigns targeting young consumers can significantly influence purchase behavior toward safer and more sustainable products.

To meet the growing demand for safer and more sustainable products, several Indian brands have begun to adopt green chemistry principles and eco-friendly formulations.

Martinez et al (2022) highlight the emergence of natural and Ayurvedic cosmetic products in India, which use traditional knowledge and locally sourced ingredients. These alternatives not only reduce health risks but also promote environmental sustainability, attracting a growing number of health-conscious consumers.

A recent study by Nair et al (2024) found that brands using natural ingredients experienced a marked increase in consumer trust and loyalty, reinforcing the market potential for safer cosmetics. The regulatory landscape for cosmetics in India poses a complex challenge as it differs significantly from other regions, such as the European Union, which imposes stricter controls on chemical safety.

Kumar et al (2021) argue for the harmonization of regulatory measures to prioritize consumer safety and environmental protection. This would involve a collaborative effort between manufacturers, policymakers, and public health agencies to address pressing issues related to the use of cosmetics. Future research should focus on longitudinal studies to assess the long-term health and environmental impacts of cosmetic use, especially in the Indian context. Further research on consumer behavior and the effectiveness of educational interventions could provide valuable insights into effective strategies for building public awareness.

The current literature highlights the complex relationship between the use of fragrances, flavors, and cosmetics and their potential adverse impacts on human health and the environment. A comprehensive approach that includes strengthened regulatory frameworks, increased consumer awareness, and the development of sustainable alternatives is required to effectively address these concerns.

The findings presented in this review highlight the need for a collaborative effort between researchers, policymakers, industry stakeholders, and consumers to promote safer practices in the cosmetics industry while protecting public health and environmental integrity, especially in the Indian context. Future research should continue to explore these aspects, ultimately promoting a more

sustainable and informed approach to the use of personal care products.

METHODOLOGY

Literature Search Strategy:

A methodical review of the literature was conducted to gather crucial studies on the dangerous goods of spices, aromas, and cosmetics on mortal health and the terrain. The following ways were enforced:

- Database Selection

Comprehensive quests were performed using academic databases similar to PubMed, Scopus, Web of Science, and Google Scholar to ensure a wide range of applicable studies.

- Keyword Identification

Important keywords included “synthetic spices”, “endocrine disruptors” “ornamental safety”, “respiratory health”, “skin responses”, “environmental impact of cosmetics”, “microplastics” and “toxicology”. Boolean drivers (AND, OR) were used to enhance hunt perfection.

- Hunt Pollutants

Pollutants were applied to limit results to peer-reviewed papers, clinical studies, and meta-analyses published in English between 2013 and 2023, landing the most recent exploration trends^{[1][3][6][14][17][22][28][40]}

Addition and Rejection Criteria

The following criteria guided the selection of papers

- Addition Criteria
- Peer-reviewed studies fastening on health impacts, environmental goods, or nonsupervisory fabrics related to beauty products.
- Exploration addressing specific dangerous constituents, similar to synthetic spices and hormone disruptors.
- Papers furnishing quantitative or qualitative data on health pitfalls or environmental consequences.
- Exclusion Criteria
- Non-peer-reviewed papers, studies, and opinion pieces.
- Studies that didn't specifically address health or environmental issues.
- Unpublished accouterments not available in English^{[6][9][12][18][20][31]}

Data birth and conflation

named papers were anatomized, and applicable information was uprooted using a standardized data birth form, which included

- Study Information: Authors, publication time, and journal.
- Study Design: Type of study(e.g., experimental, experimental, review).
- Key Findings: linked health goods, concerning substances, and environmental impacts.

- Regulatory perceptivity: Discussion on current regulations and linked gaps in oversight.

The uprooted information was thematically organized to identify patterns, participated findings, and disagreements in the literature. This categorization included health goods (e.g., respiratory problems, skin responses) and environmental enterprises (e.g., microplastics, chemical runoff). ^{[5][10][17][29][34][41]}

Critical Evaluation

Each study passed a thorough assessment for methodological quality and applicability

- Quality Assessment

A frame was employed to estimate the strength of included studies, considering factors like sample size, methodology, and implicit impulses. A roster, similar to the PRISMA guidelines, assured a comprehensive evaluation.

-Results Analysis

The significance of findings was assessed concerning their counteraccusations for public health and environmental programs. This involved comparing results across studies and relating areas where exploration is lacking.

Recommendations

Grounded on the synthesized findings and critical evaluation, the paper proposes

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-Regulatory Advancements:
Recommendations for enhancing
regulations governing ornamental safety.

- Consumer mindfulness enterprise:
Strategies to educate the public about the
dangerous goods of specific constituents in
cosmetics.

- Unborn exploration Directions:
Identification of crucial areas for further
discourse, particularly concerning long-
term health goods and environmental
impacts.

Summary

The methodology concludes with a recap of
the crucial findings, emphasizing the
critical need for advanced safety practices
in beauty assiduity and the significance of
collaboration among experimenters,
policymakers, and consumers to foster
healthier and further sustainable
ornamental products. This methodology
outlines a structured approach to reviewing
the literature on the negative goods of
spices, aromas, and cosmetics, aiming to
consolidate understanding and emphasize
the need for better regulations and
increased consumer
mindfulness.^{[3][5][13][18][24][29][31][33][36][42][44][48][50]}

**DATABASE REGARDING THE
STUDY OF EFFECTS OF
FRAGRANCES**

Recent exploration highlights significant
health enterprises associated with using

scents and scented products. roughly 30 of
individuals report passing antipathetic
responses, including skin vexation and
respiratory issues, due to exposure to
spices. In a check, 20 women indicated they
suffer from headaches and skin problems
directly linked to their use of scented
products. These responses are frequently
attributed to the complex blend of
chemicals set up in these particulars,
numerous of which aren't easily bared on
product markers likewise, a near
examination of scent factors reveals
intimidating statistics. Up to 60 of
conventional spices contain phthalates, a
class of chemicals that have raised
enterprises for their part in endocrine
dislocation and implicit reproductive health
issues.^{[2][3][5][19][25][33][34]}

These substances can intrude with hormone
function, leading to a variety of health
problems, including matters experimental
to children and dropped fertility in grown-
ups. Given that numerous consumers may
not be apprehensive of these pitfalls, the
frequency of phthalates in everyday
products poses a significant public health
concern.

Makeup products aren't pure from scrutiny
moreover. The Environmental Working
Group (EWG) estimates that over 75 of
makeup, particulars contain dangerous
constituents similar to parabens, which

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have been linked to hormone dislocation and increased cancer threat. Also, formaldehyde-releasing agents, known carcinogens, are constantly set up in cosmetics. Amazingly, 95 of the spices used in these products are deduced from synthetic sources, which may include poisonous composites that can accumulate in the body over time, raising further health enterprises. [6][7][8][17][23][24]

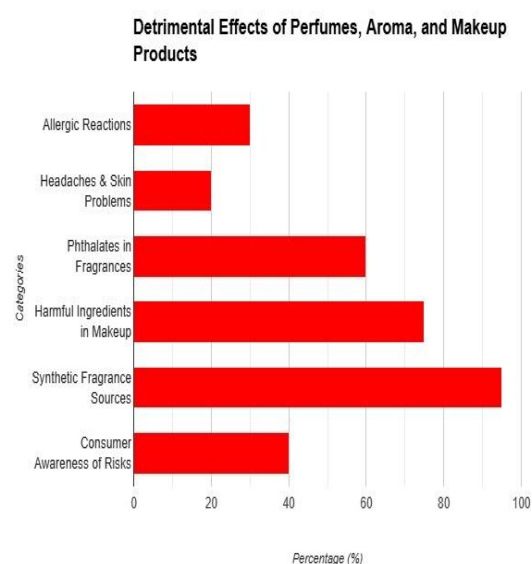
Despite these pitfalls, about 40 of consumers remain ignorant of the implicit troubles associated with diurnal exposure to scents, aromas, and makeup products. This gap in knowledge underscores the significance of educating consumers about component translucency and the health counteraccusations of using these generally accepted beauty products. As mindfulness grows, consumers can make informed choices about their particular care routines, prioritizing safer druthers and reducing their exposure to dangerous chemicals. [12][13][24]

Data Analysis Insights

- Synthetic Fragrance Sources (95%) have the highest percentage, indicating a widespread presence of artificial fragrances in products.
- Harmful Ingredients in Makeup (75%) is concerning, highlighting potential health risks associated with makeup use.

- Phthalates in Fragrances (60%) are significant, suggesting the presence of potentially endocrine-disrupting chemicals in fragrances.

- Consumer Awareness of Risks (40%) is relatively low, indicating a need for increased education about the potential downsides of these products.



- Allergic Reactions (30%) and Headaches & Skin Problems (20%) are still noteworthy, showcasing potential health consequences for consumers.

Overall, the data suggests potential health concerns associated with perfumes, aromas, and makeup products. It emphasizes the importance of consumer awareness and potentially opting for fragrance-free or natural alternatives.

[1][2][4][6][23][24][27][34][35][37][40][42]

HARMFUL CHEMICALS USED IN PRODUCTS

In the realm of specialized care products, various noxious chemicals pose critical health risks to users. One class of prominent members is phthalates, which include diethyl phthalate(DEP), dibutyl phthalate(DBP), and diethylhexyl phthalate(DEHP). These chemicals, primarily utilized as plasticizers that give flexibility to plastics, are introduced in spices, poultices, and cosmetics. Known endocrine disruptors, phthalates interfere with hormonal activities, which may cause reproductive problems, experimental delays, and an increased risk of certain cancers.

Another concerning order is parabens, similar to methylparaben and propylparaben, which serve as preservatives to help microbial growth in cosmetics. Parabens can mimic estrogen in the body, dismembering hormonal balance, and have been detected in mortal bone cancer napkins, raising intimidating questions about their link to bone cancer and reproductive toxins. also, formaldehyde-releasing agents like DMDM hydantoin and quaternion- 15 release formaldehyde, an honored carcinogen, when they break down. Exposure to these agents can affect skin vexation, antipathetic responses, and respiratory problems, with habitual

exposure associated with an elevated threat of cancers, particularly nasopharyngeal cancer. ^{[11][13][15][19][20][21][26][33][32][45][46][47]}

Toluene, a solvent generally set up in nail polishes and spices, presents fresh hazards. This chemical can negatively impact the nervous system, causing symptoms similar to headaches and dizziness, while habitual exposure may lead to liver and order damage. likewise, synthetic scent composites, including linalool and limonene, can beget antipathetic responses and skin sensitization in sensitive individualities. Synthetic musks, similar to musk ketone, are known to bioaccumulate in mortal napkins, raising enterprises about their implicit hormonal dislocation.

Benzophenones, similar to benzophenone-3- 3(oxybenzone), are employed in sunscreens and cosmetics to absorb UV light. While they give sun protection, they've also been linked to hormone dislocation and skin disinclinations. The antibacterial agent triclosan, set up in some detergents and particular care products, poses its pitfalls, potentially dismembering endocrine function and contributing to antibiotic resistance. Also, heavy essences like lead and mercury, frequently present in powders and certain colors, can lead to neurological damage and colorful habitual health conditions

[1][2][3][5][16][17][19][22][24][36][38][39][41][45][49][50]

Initially, aliphatic amines like ethanolamine and triethanolamine are utilized in cosmetics as emulsifiers in formulations but can irritate the skin and eyes. They also contribute to the formation of nitrosamines which are known carcinogens. The prevalence of these hazardous agents in fragrances, perfumes, and cosmetics highlights the necessity for greater consumer awareness and non-regulatory regulation. Continued exploration is essential to understand the long-term goods of these chemicals, championing safer druthers in the cosmetics assiduity.

TYPES OF PRODUCTS WITH HARMFUL CHEMICALS FOUND IN THEM

Certain personal care products are known to contain higher concentrations of harmful chemicals due to their specific formulation needs, preservation methods, and the inclusion of fragrance components. Below are some products that typically have elevated levels of these chemicals, along with explanations for their use:

1. Fragrances and Perfumes

Fragrances often comprise a complex blend of synthetic chemicals, including phthalates and synthetic musk compounds. These substances are utilized to enhance scent duration and create appealing aromas. Unfortunately, regulatory gaps can allow

manufacturers to include potentially harmful ingredients without complete transparency, exposing consumers to allergens and endocrine disruptors.

2. Makeup Products

a. Foundations and Concealers: These items frequently contain parabens and heavy metals, such as lead, which act as preservatives and colorants. Parabens help to inhibit microbial growth, extending the product's shelf life. However, their potential hormonal effects raise health concerns.

b. Lipsticks: Many lipsticks may contain lead and other heavy metals due to the pigments used. Regular use of these products can result in the leaching of these metals into the body, posing significant health risks.

c. Mascaras: Some mascaras may contain formaldehyde-releasing agents and synthetic fragrances to enhance texture and durability. These ingredients can lead to eye irritation and allergic reactions.

Chemical sunscreens, especially those containing benzophenones like oxybenzone, are designed to absorb UV radiation effectively. While they provide essential sun protection, these compounds may disrupt hormonal functions and have been associated with reproductive health concerns. The need for effective sun protection contributes to the inclusion of these chemicals despite their risks.

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Nail polishes and removers frequently contain toluene and formaldehyde, which are used as solvents and hardeners. While these chemicals enhance the performance and longevity of the products, they can also cause headaches, dizziness, and long-term health issues, particularly with repeated exposure in poorly ventilated areas.

Shampoos, conditioners, and styling products often include sulfates, silicones, and parabens. Sulfates serve as effective cleansers but can strip away natural oils and irritate the scalp. Parabens are used as preservatives. The demand for products that provide volume, shine, and pleasant scents can lead to higher concentrations of potentially harmful ingredients.

Many body washes and liquid soaps contain synthetic fragrances and preservatives, including phthalates and parabens, to enhance the scent and prevent spoilage. The formulation for an appealing sensory experience often results in elevated levels of these chemicals, which can irritate sensitive skin and contribute to allergic reactions.

The high levels of harmful chemicals in these products are largely driven by consumer demands for effectiveness, longevity, and sensory appeal. Manufacturers frequently prioritize product performance and aesthetic qualities, leading to formulations that may contain

significant amounts of harmful substances.

This situation underscores the need for enhanced regulation, better transparency, and increased consumer education to promote safer alternatives and improve labeling practices in the personal care industry.^{[3][4][5][7][9][12][13][14][16][21][23][27][28][29][30][32][38][44][47][48][49]}

FORENSIC PERSPECTIVE OF PERFUMES, AROMAS AND COSMETICS

From a forensic perspective, the mischievous goods of scents, aroma, and makeup products raise significant enterprises, particularly regarding the identification and analysis of dangerous substances. Forensic scientists frequently probe the chemical composition of these products to assess their safety and implicit health impacts.^{[23][24][27][39]}

Chemical Analysis

numerous scents and ornamental products contain a wide range of synthetic and natural composites. Forensic druggists employ ways similar to gas chromatography-mass spectrometry (GC-MS) to dissect these substances. This enables the discovery of potentially dangerous chemicals, similar to phthalates, parabens, and formaldehyde-releasing agents, which can be linked to colorful health issues. relating these composites is

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pivotal for understanding their goods on mortal health and the terrain.

Toxicology

Forensic toxicology plays a vital part in assessing the impact of chemical exposure on particular care products. Toxicologists study how these substances interact with the mortal body, assessing their immersion, metabolism, and implicit for causing antipathetic responses or habitual health conditions. For case, long-term exposure to endocrine disruptors like phthalates may lead to reproductive issues, leading to forensic examinations into the sources of exposure.

Antipathetic Responses and Health Records

Forensic analysis can also include examining medical records and reports of antipathetic responses linked to specific products. This data can help establish patterns of adverse goods associated with particular brands or phrasings. Investigators may collect case studies to understand the frequency of responses among druggies, contributing to broader public health conversations.

Regulatory Counteraccusations

From a forensic perspective, the analysis of dangerous constituents in cosmetics has counteraccusations from nonsupervisory

bodies. Forensic scientists may give expert evidence in cases where product safety is questioned, supporting regulations that dictate clearer labelling and safety testing of cosmetics. This can lead to increased scrutiny of constituents that pose health pitfalls, impacting product expression and marketing practices.

Environmental Considerations

Also, the forensic disquisition extends to the environmental impact of these products. Chemicals in scents and cosmetics can accumulate in ecosystems, leading to enterprises about bioaccumulation and toxins in wildlife. Forensic ecologists may dissect environmental samples to trace adulterants back to their sources, pressing the broader counteraccusations of particular care product operations.

In summary, a forensic view of the naughty goods of perfumes and fragrances, perfume, and cosmetics material includes chemical analysis, toxicology, health records review, non-supervisory counteraccusations, and environmental concerns. A forensic practitioner plays an important role in looking out for the consumers and recommending transparency in the cosmetics industry by using scientific analysis to study these products. This interdisciplinary approach draws attention to the need for smart consumer decision-

making and nonsupervisory reforms toward health hazards caused by widely consumed products^{[1][3][5][6][7][8][11][14][17][20][21][23][26][28][30][36][37][40][42][44][45][48][49]}.

CONCLUSION

W It is multifaceted because perfumes, fragrances, and cosmetics may pose negative effects to health as well as to the environment. The more understanding there is about the chemicals that exist in such products, the clearer it is about many ingredients being dangerous health-wise, causing allergic reactions, disrupting the endocrine systems, and even cancerogenic. Such lack of knowledge leaves consumers with vulnerabilities to substances within everyday commodities, mostly in the form of perfumes, lotions, and makeup.

There is also the environmental consequence of personal care. Many fragrance compounds and cosmetic ingredients are toxic not only to humans but also to marine life and ecosystems. The discharge of these chemicals into the water bodies has increased pollution and bioaccumulation, which threatens the wildlife and ecological balance. Such issues result from non-existent regulations, which allow questionable substances to be in consumer products without good safety assessments.

[4][5][8][11][14][19][20][21][22][26][27][35][38][48][50]

It makes it even more challenging for the cosmetic industry to embrace sustainability while developing awareness amongst consumers about ingredient transparency and safety. The present need is creating effective comprehensive rules that focus on public safety and environmental sustainability. Stakeholders such as manufacturers, regulators, and consumers must come together to speak about safer alternatives and proper guidelines.

In addition, further research should be conducted on safer alternatives for harmful ingredients and the development of new formulations that have a lesser impact on the environment. Educating consumers about potential risks associated with cosmetic products and encouraging them to make informed choices can empower individuals to seek safer options. Increased investment in green chemistry and sustainable practices within the cosmetic industry can lead to significant improvements in both product safety and environmental stewardship.

A cosmetic industry that aligns with sustainability and responsibility in both directions of fulfilling the demand of consumers while also ensuring safety for public health and the environment would be achieved through a collaborative effort by different industries to address the negative

impacts of perfumes, aromas, and cosmetics. [7][12][27][34][44][45][49]

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CONFLICT OF INTEREST

The authors declare no conflicts of interest

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