ORIGINAL PAPER

CONSUMER HABITS AND PRACTICES FOR COSMETICS: A STATISTICAL APPROACH

RALUCA MARIA BUCUR (POPA)[1,2], SORINA GEANINA STANESCU[3]*, CRISTIANA RADULESCU[1,4,5*], ANDREEA LAURA BANICA[1,3], RALUCA MARIA STIRBESCU[3]

Manuscript received: 09.04.2025; Accepted paper: 10.06.2025; Published online: 30.06.2025.

Abstract. *The main aim of this study is to identify and analyze the behavioral factors that influence consumers' attitudes and purchasing decisions regarding cosmetic/ dermatocosmetic products. The goal is to understand the mechanisms behind the selection and use of these products from both sociological and behavioral/habit perspectives. While the study does not directly target the optimization of companies' marketing strategies, it serves as the initial phase of a multidisciplinary research approach. This approach will be followed by physicochemical analyses of representative products to detect the presence of microplastics. In addition to the main objective, the study includes several specific goals: (i) identifying the most commonly used cosmetic products; (ii) highlighting preferred brands and assessing brand loyalty; (iii) analyzing the motivations for consumption and levels of satisfaction related to quality and price; (iv) evaluating the impact of promotional techniques on purchasing behavior; (v) exploring the relationship between socio-demographic characteristics and consumption patterns. This study has demonstrated that collecting data on habits and practices using a rapid, cost-effective online survey method alongside a statistical approach is feasible. While there are some limitations with the collected data, this approach can effectively gather preliminary information on consumers' behaviors and habits related to cosmetic practices or loyalty to cosmetic product categories.*

Keywords: *Cosmetic products; consumer behavior; survey; statistical analysis.*

1. INTRODUCTION

Skin health significantly relies on each person's lifestyle choices, such as a balanced and varied diet, regular exercise, adequate rest, and effective stress management. All of these factors play a crucial role in skincare and in maintaining healthy skin. Nowadays, the use of cosmetic and dermatocosmetic products has become an integral part of the daily routine, regardless of age, gender, or socio-economic status. Products such as facial cleanser, shower

[1] National University of Science and Technology Politehnica of Bucharest, Doctoral School of Chemical Engineering and Biotechnology, 060042 Bucharest, Romania.
[2] Valahia University of Targoviste, Research and Expertise Center for Natural Resources and Environment, 130004 Targoviste, Romania.
[3] Valahia University of Targoviste, Institute of Multidisciplinary Research for Science and Technology, 130004 Targoviste, Romania. E-mail: geaninastanescu@yahoo.com.
[4] Valahia University of Targoviste, Faculty of Sciences and Arts, 130004 Targoviste, Romania. E-mail: cristiana.radulescu@valahia.ro.
[5] Academy of Romanian Scientists, 050044 Bucharest, Romania.
Corresponding authors: geanina.stanescu@icstm.ro; cristiana.radulescu@valahia.ro.

https://doi.org/10.46939/J.Sci.Arts-25.2-b03

gel, shampoo, liquid soap, body lotion, body wash, solid antiperspirant, and face moisturizer are now considered essential for personal hygiene and skincare [1,2]. However, with the development of the market and the diversification of the range of available products, enhanced concerns have arisen regarding their chemical composition and potential effects on human health, but also on environmental sustainability [3].

In the beauty and skincare industry, there is a wide variety of cosmetic and dermatocosmetic products, each with distinct characteristics. This diversity can make it challenging to identify the products that truly meet the needs. It's essential to understand the differences between cosmetics and dermatocosmetic products, as they both serve the same primary purpose, skin care, yet have different formulations and benefits [4]. The primary difference between cosmetics and dermatocosmetics lies in their chemical composition. Thus, dermatocosmetics contain natural active substances known for their effects, substances tested by dermatological specialists, which makes them similar to topical dermatological products (i.e., creams, ointments) and provide in-depth action. This is also the reason why they are safe even for sensitive skin. In terms of their action on the skin, dermatocosmetics have a dual role: cosmetic and to restore skin balance, to treat certain conditions [5]. In other words, when beauty and health meet, or cosmetics and skin meet, then it is about dermatocosmetics. Thus, there are dermatocosmetics for treating acne, seborrheic dermatitis, hyperpigmentation, and more [6]. Thus, dermatocosmetics are a more complex version of cosmetics, in the sense that due to their active ingredients are designed to be more compatible with various skin types, including oily, dry, combination, sensitive, and normal skin, according to the American Academy of Dermatology (AAD) data [7-10].

Various studies have drawn attention to the negative impact of certain ingredients in conventional cosmetics, such as microplastics, parabens, or other preservatives [11-18]. But, it seems that nearly every substance from the chemical composition of cosmetics can affect the structure and function of skin measurably [12,13]. Currently, even the innocuousness of water can be considered quite harmful to skin under certain circumstances. This awareness has led to a significant change in consumer behavior, who tend to adopt a healthier and more sustainable lifestyle towards the environment [13,19].

In the context of increasing awareness of personal care and the impact of cosmetic products on human health and the environment, this study aims to analyze consumer behavior regarding cosmetics/dermatocosmetics. The wide range of products available in the market, advertising influences, and also the recommendations of specialists determine consumers to adopt varied behaviors in terms of choice, usage frequency, and loyalty to brands. In this respect, it is essential to understand how consumers relate to cosmetic products, what factors influence their choices, what are the brand preferences, usage frequency of different types of cosmetics and, especially, how these behaviors vary according to the demographic characteristics of the users, such as gender, age, level of education or monthly income. Based on the application of a structured opinion survey, which aimed to collect relevant data on consumer behaviors, preferences, and habits towards cosmetic/dermatocosmetic products, a study was initiated to investigate the aforementioned aspects. The methodological stages of the research, along with the specifications of the issue and the statistical analysis, were detailed, as well.

Additionally, this research aims to objectively investigate the purchasing and consumption behavior of users of cosmetic/dermatocosmetic products, with a focus on the influence of factors such as product characteristics, promotional techniques, and demographic elements on the purchase decision. The study was based on the application of an opinion poll, designed to highlight the main consumption trends, the level of satisfaction, and individual preferences concerning different categories of cosmetic/dermatocosmetic products (i.e., *rinse-off/wash-off* and *leave-on cosmetics*).

2. MATERIALS AND METHODS

2.1. DATA COLLECTION

A list of six cosmetic products was selected to be investigated in this study, based on common high-exposure products that consumers use, i.e., *rinse-off/wash-off cosmetics* (shower gel, shampoo, liquid soap), and *leave-on cosmetics* (micellar water, body/face moisturizer, cleansing oil), respectively. These products can be rinsed off or left on, and the method of use was not differentiated in the questionnaire.

The survey was distributed online using the Google Forms platform and was shared through various communication applications and electronic channels, including email and social networks. The web-based survey and data collection were conducted between February to March 2024. This digital distribution allowed for quick access and made it easy for participants to complete the forms.

Participation in the survey was conducted anonymously, taking into consideration the level of education and budget. Main participants aged between 18 and 55 years, males and females, regular users of surveyed products, were considered eligible. On the other hand, 11 teenagers with an age of less than 18 years and 8 people with an age of over 55 years were eligible to participate in the survey. Accordingly, after removing outliers and unusable data, a total of 178 subjects from 184 participants were included in the cosmetic habits and practices dataset. The research was structured in three sections: *(i)* the first part focused oa number ofn analyzing consumer behavior regarding various categories of cosmetic products, including aspects like frequency of use and brand preferences; *(ii)* the second part aimed to identify the motivational factors and the impact of promotional techniques on purchase decisions; *(iii)* the final section consisted of socio-demographic questions, such as age, gender, income, and level of education, which help in creating the respondent's profile.

2.2. OBJECTIVES AND HYPOTHESES OF RESEARCH

The primary objective of this study is to identify and analyze the behavioral factors influencing consumers' attitudes and purchasing decisions in terms of cosmetics. On the other hand, other goals such as *(i)* identifying the most commonly used cosmetic products; *(ii)* highlighting preferred brands and assessing brand loyalty; *(iii)* analyzing the motivations for consumption and levels of satisfaction related to quality and price; *(iv)* evaluating the impact of promotional techniques on purchasing behavior; *(v)* exploring the relationship between socio-demographic characteristics and consumption patterns, are taken into account for an overall view of the Romanian consumer of cosmetic products.

Based on the research objectives, the following hypotheses have been formulated. **H1:** *There are significant differences between genders in terms of the frequency of use of cosmetic products*. **H2:** *Monthly income influences the choice of cosmetic product brands.* ***H3:*** *Consumer age is associated with the main motivation for using products (e.g., hydration, treatment, fragrance).* **H4:** *The level of satisfaction with the quality/price ratio differs depending on the used product type*. **H5:** *Consumers who frequently use cosmetic products are more loyal to the chosen brands*.

2.3. DATA ANALYSIS

After the collection period, the completed surveys were verified for validity, and incomplete or inconsistent responses were eliminated from the analysis. Valid data were centralized in an Excel database, which was subsequently imported into SPSS for statistical processing. The recorded data were analyzed using IBM SPSS Statistics software (SPSS Inc., Chicago, IL, 2011). The database contains the coded variables corresponding to each item in the survey and is ready for descriptive, inferential, and exploratory analyses.

3. RESULTS AND DISCUSSION

3.1. RESULTS

The first question in the survey aimed to establish the profile of consumers who use cosmetic and dermatocosmetic products, as they represent the relevant segment for further analysis. Identifying participants who declare that they use such products allowed the delimitation of the active sample and ensured the coherence of subsequent interpretations. This stage was crucial for validating the database and filtering participants based on the relevance of their answers to the study's objectives. Since the research focuses on understanding consumer behavior towards frequently used cosmetic products (i.e., micellar water, shower gel, shampoo, body/face moisturizer, etc.), only those participants who indicated the use of at least one category of analyzed products were included in the detailed interpretation of the results. This selection contributes to the accuracy of the conclusions and to the subsequent substantiation of the experimental approach, which involves analyzing the chemical content of representative products, especially regarding the presence of microplastics. The analysis of the responses to the first question of the survey shows that a higher percentage of participants (96.7%) declare that they use cosmetic and dermatocosmetic products, while only 3.3% indicate that they do not use such products (Table 1). These results highlight the fact that the use of cosmetic products is a widespread practice among the analyzed sample, being integrated into the daily routine of the majority of participants.

Table 1. Distribution of participants regarding the use of cosmetic products.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	**Yes**	178	96.7	96.7	96.7
	No	6	3.3	3.3	100.0
	Total	184	100.0	100.0	

Regarding the categories of cosmetics used by the 184 participants, the obtained results showed that 140 (73.70%) of the subjects frequently use cleansing cosmetics, while 138 (72.60%) choose skincare products. A smaller number of subjects use beauty products, i.e, 64 (33.70%), while treatment products are used only by 50 (26.30%) of the subjects. This distribution suggests that consumers' concerns are primarily oriented towards maintaining personal hygiene and basic care, and to a lesser extent towards the beautification or therapeutic aspects of the cosmetic routine.

The centralized statistical values regarding the frequency of cosmetic product consumption among the participants range from a minimum value of 0 to a maximum value of 6, according to data presented in Table 2.

Based on the calculated scores, most participants consider that soap, shower gel, and body/face moisturizer are the products with the highest degree of use, these being used daily, or even several times a day, by most of the subjects. On the other hand, a moderate consumption was recorded for the micellar water and shampoo, these cosmetics being used predominantly once a day or weekly in the case of shampoo by most participants. Additionally, according to the participants' decisions, the cleansing oil was used less frequently (Table 2). Thus, 48 participants reported using cleansing oil daily, 44 subjects used it twice a week, and 83 did not use it at all.

Table 2. Cosmetics usage frequency by participants.

Products	Frequency of use							Statistical score obtained	Standard deviation [δ]	Consumption decision
	0	**1**	**2**	**3**	**4**	**5**	**6**			
Micellar water	11	93	26	7	1	3	37	3.29	2.062	Moderately
Liquid soap	94	79	1	2	0	0	2	1.56	0.816	High
Shower gel	23	133	15	1	0	0	6	2.13	1.033	High
Shampoo	4	28	111	34	1	0	0	3.00	0.681	Moderately
Body/face moisturizer	37	107	21	2	2	1	8	2.21	1.284	High
Cleansing oil	4	46	43	3	2	0	80	4.53	2.298	Low

Note: Number of cases – 178; 0 - use 2-3 times a day; 1 - use daily; 2 - use 2-3 times a week; 3 - use weekly; 4 - use 2-3 times a month; 5 - use monthly, and 6 - do not use.

Taking into consideration the gender, age (Figs 1 and 2), and level of education/studies (Fig. 3) of participants in this survey, it can be observed that cosmetics from the category of leave-on products (i.e., micellar water and body/face moisturizers) were more commonly used by females, while males used especially rinseoff/wash off cosmetics in the order liquid soap > shower gel > shampoo.

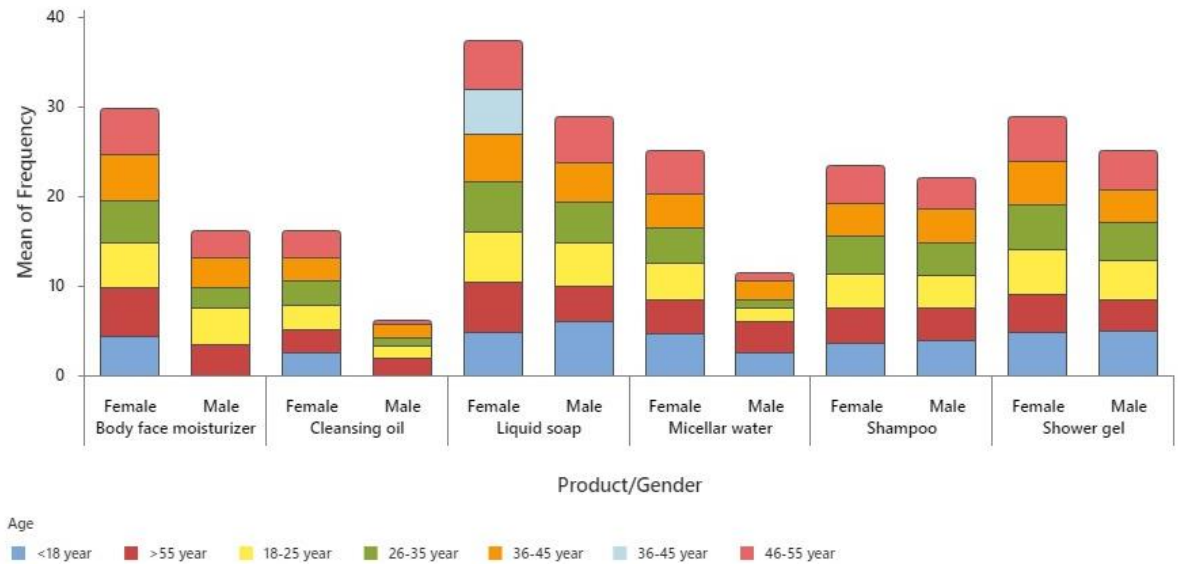

Figure 1. The cosmetic preference of participants based on gender and age.

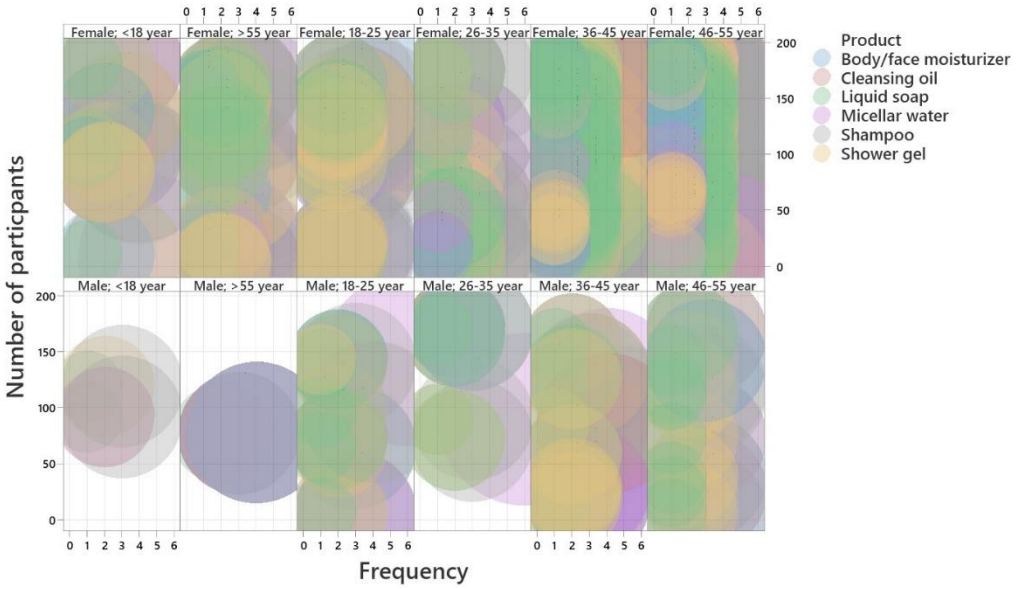

Figure 2. Cosmetics usage frequency* among survey participants by gender and age;
0 - use 2-3 times a day; 1 - use daily; 2 - use 2-3 times a week; 3 - use weekly; 4 - use 2-3 times a month; 5 - use monthly, and 6 - do not use.

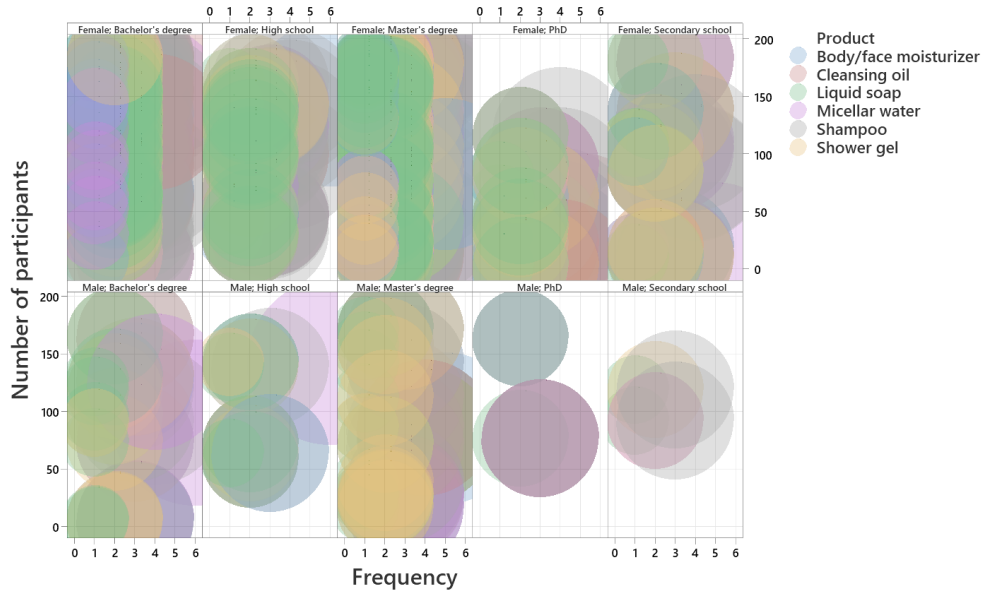

Figure 3. Correlation between cosmetics usage frequency* based on gender and the education level;
0 - use 2-3 times a day; 1 - use daily; 2 - use 2-3 times a week; 3 - use weekly; 4 - use 2-3 times a month; 5 - use monthly, and 6 - do not use.

Regarding the main motivations for using the six product categories included in the study, the survey targeted eight response options (Table 3), the first seven being specific indications for the use of cosmetic/dermatocosmetic products, and the last option allowing participants to mark as "*I do not use*" a certain product category. From Table 3, it can be seen that the primary motivation for using cosmetic products is daily routine/hygiene, even for the cleansing oil product category, for which if we exclude the option of not using, mentioned by 46.10% of the participants, the next option with the highest response rate is the one related to daily routine and hygiene.

Table 3. Frequency of responses regarding reasons for using cosmetic products.

	Micellar water	Liquid soap	Shower gel	Shampoo	Body/face moisturizer	Cleansing oil
Daily routine/hygiene	61 (34.30%)	131 (73.60%)	123 (69.10%)	89 (50.00%)	70 (39.30%)	36 (20.20%)
Clean	66 (37.10%)	42 (23.60%)	40 (22.50%)	74 (40.20%)	8 (4.50%)	22 (12.40%)
Skin protection	4 (2.20%)	2 (1.10%)	3 (1.70%)	2 (1.10%)	39 (21.90%)	21 (11.80%)
Reducing imperfections	1 (0.60%)	0	0	1 (0.60%)	8 (4.50%)	6 (3.40%)
Freshness/ Fragrance	3 (1.70%)	0	4 (2.20%)	4 (2.20%)	4 (2.20%)	2 (1.10%)
Hydration	1 (0.60%)	0	1 (0.60%)	3 (1.70%)	35 (19.70%)	8 (4.50%)
Treatment	1 (0.60%)	0	0	5 (2.80%)	6 (3.40%)	1 (0.60%)
Does not use	41 (23.00%)	2 (1.10%)	7 (3.90%)	0	8 (4.50%)	82 (46.10%)
Total	**178 (100%)**	**178 (100%)**	**178 (100%)**	**178 (100%)**	**178 (100%)**	**178 (100%)**

In addition, the identification elements of the participants, through the analysis of the database, a fairly large discrepancy was observed in the subjects according to their gender, with the majority being female, i.e., 147. This unequal distribution is justifiable both from the perspective of the specifics of the research topic and from a sociological and behavioral point of view. Cosmetic products are traditionally part of the predominant daily routine of women, who show an increased interest in skin care, makeup, cleansing, and care products [20,21]. Nowadays, women have a better understanding of how skin reacts to external factors such as sunlight or pollution. They know more about why and how skin ages, loses firmness, develops wrinkles, and even becomes ill. The growing awareness and increasing demand from women for truly effective and safe products have led to the development and availability of items that were once only found in the medical field. While dermocosmetic products are not classified as beauty products, they undeniably enhance beauty. Moreover, numerous studies in the specialized literature confirm that women are the main consumers of cosmetic products globally [22-24]. In addition, from a statistical point of view, the low share of men in the sample reflects both the reality on the market and the behavior of participating in surveys on this topic, with men often being less involved in completing surveys related to personal hygiene or cosmetics, even if the market dedicated to them is growing. Most participants reported having a higher education level, with 40.70% holding a master's degree and 30.70% possessing a bachelor's degree. A small percentage of participants reported still being in middle school (4.90%) or high school (8.70%).

Fig. 4 illustrates a well-balanced distribution of participants across various income categories. The majority of the participants fall into of having medium to high incomes, which creates a useful context for analyzing consumer behavior. The monthly income data shows that most participants have the financial capacity to access a wide variety of products. This information serves as a strong foundation for analyzing preferences, brand behavior, and the reporting of price and quality.

The distribution of participants by age shows a majority concentration in the 26–35 years (38.59%) and 36–45 years (29.35%) age ranges. These two categories together represented about 68% of all participants, indicating that the population engaged professionally and socially is the most represented. The 18–25 years category was also present in a significant proportion (11.41%), representing the young-adult segment, which was in a moment of forming consumption habits and was receptive to new trends in the

cosmetic field. The age groups <18 years (5.98%), respectively >55 years (4.35%), are represented in a reduced proportion, an aspect that can be explained by the lower degree of involvement in online surveys, but also by a possible less intensive use of specialized cosmetic products in these age stages.

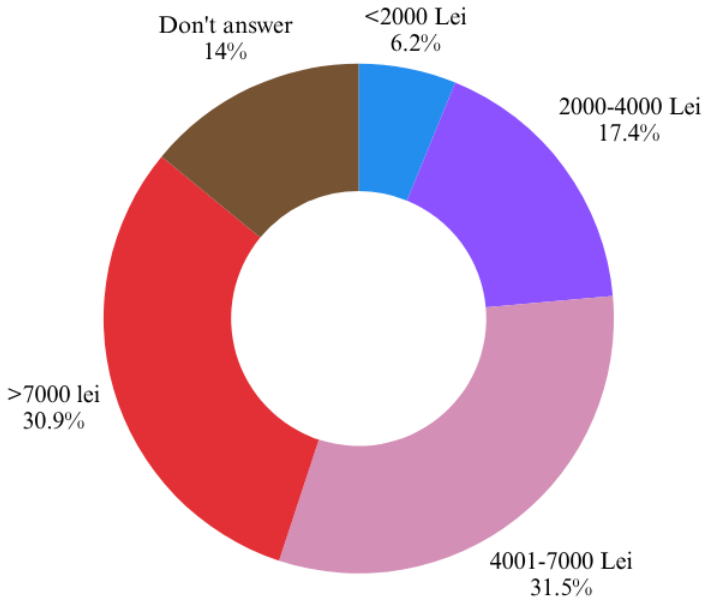

Figure 4. Share of participants according to obtained income.

Fig. 5 highlights the relationship between the cosmetics usage frequency, monthly income, and education level of participants in the survey. Data revealed that participants' education level and budget are determinants in choosing and using a wider range of cosmetics, both *rinse-off/wash-off* and *leave-on* cosmetic categories.

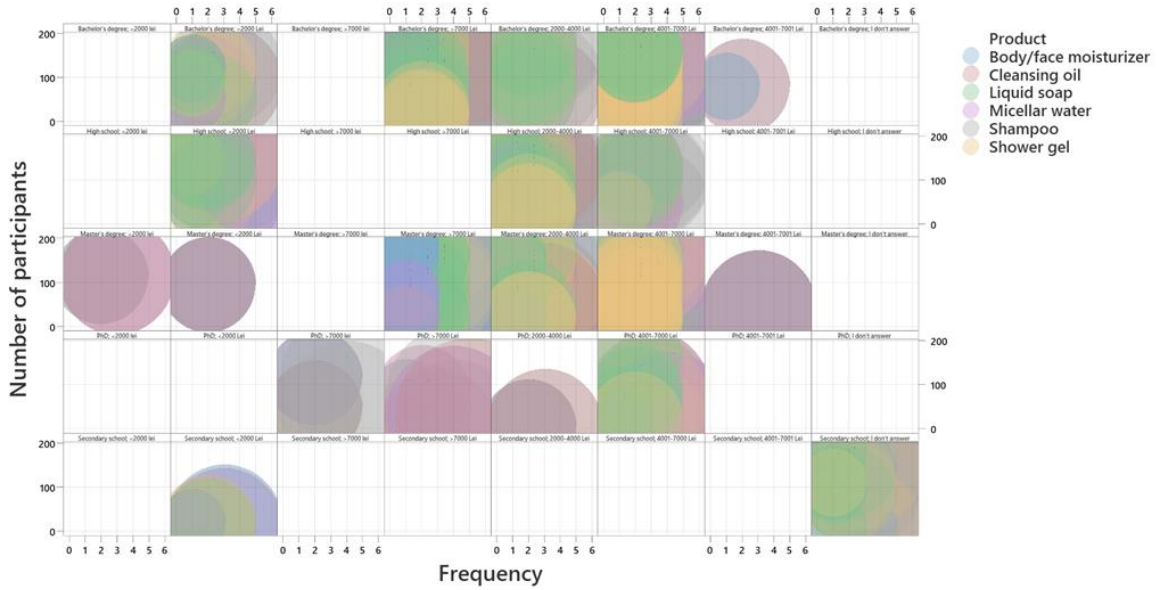

Figure 5. Correlation between cosmetics usage frequency* based on budget and education level;
0 - use 2-3 times a day; 1 - use daily; 2 - use 2-3 times a week; 3 - use weekly; 4 - use 2-3 times a month; 5 - use monthly, and 6 - do not use.

In this respect, the education level of participants is strongly correlated with the budget, influencing the decision towards resolving one of the issues included in the survey, related to the reason consumers change their cosmetic brand (Fig. 6).

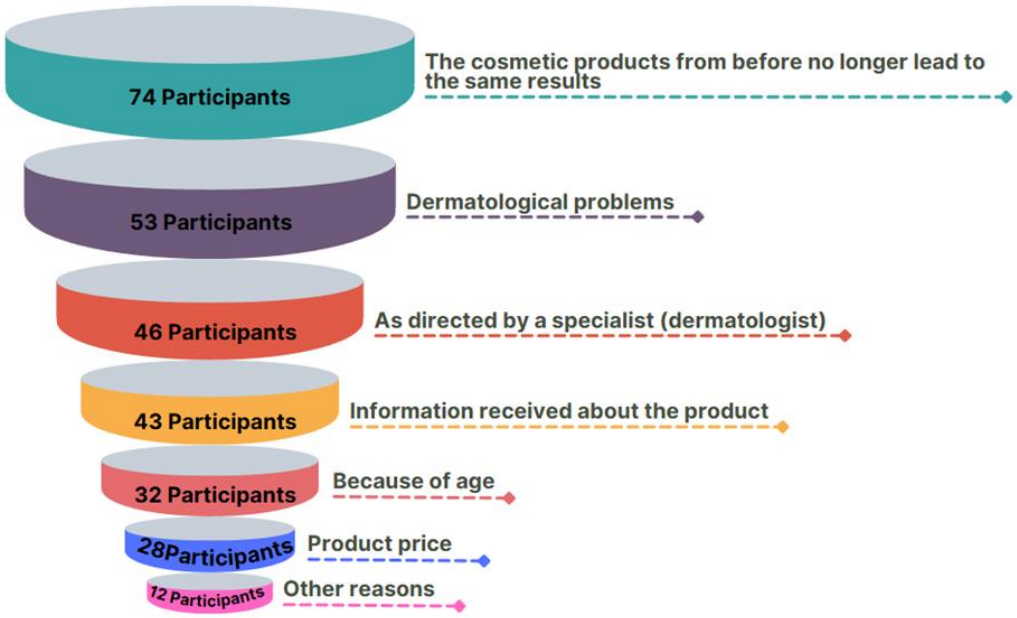

Figure 6. The main reasons participants change their cosmetic brand.

Taking into consideration the option of participants related to changing/fidelity/loyalty of cosmetic brand, the consumer preferences were distributed in three categories (Fig. 7), i.e., 101 consumers responded that they change brands quite rarely, 54 remain loyal to the brand they use, while 29 change brands regularly.

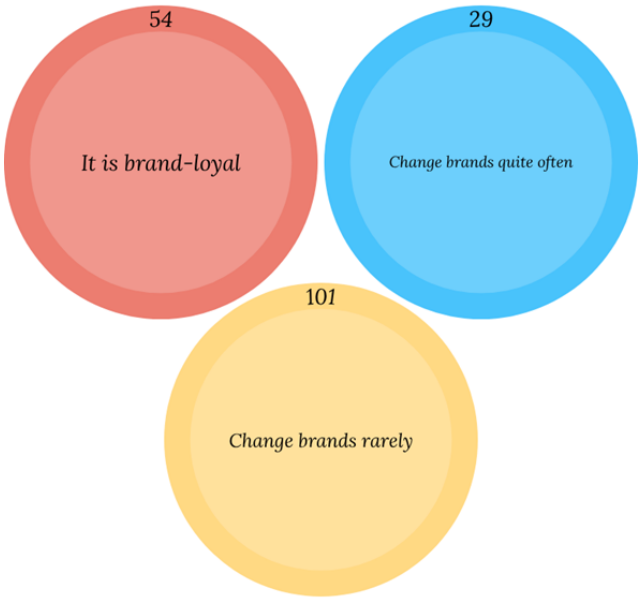

Figure 7. The participants' loyalty regarding their cosmetics preference.

3.2. DISCUSSION

To test hypothesis **H1**: *There are significant differences between genders in terms of the frequency of use of cosmetic products*, the non-parametric Mann–Whitney U test was applied for each analyzed product category (Table 4). According to the results of the Mann–Whitney U test, statistically significant differences were identified between genders in terms of the frequency of use of micellar water ($U = 882.000$, $Z = -5.807$, $p < 0.001$), body/face moisturizer ($U = 853.500$, $Z = -6.206$, $p < 0.001$), cleansing oil ($U = 1448.500$, $p = 0.001$) and shampoo ($U = 1673.500$, $p = 0.009$). In all these cases, women reported a significantly higher frequency of use comparatively to men.

Table 4. Nonparametric Mann–Whitney U test

Frequency	Gender	N	Mann-Whitney U	Z	Sig.	Significant difference
Micellar water	Female	146	882.00	-5.807	<0.001	**Yes**
	Male	31				
	Total	177				
Soap	Female	146	2076.00	-0.825	0.410	No
	Male	31				
	Total	177				
Shower gel	Female	146	2028.00	-1.195	0.232	No
	Male	31				
	Total	177				
Shampoo	Female	146	1673.50	-2.629	0.009	No
	Male	31				
	Total	177				
	Male	31				
	Total	177				
Body/face moisturizer	Female	146	853.50	-6.2060	<0.001	**Yes**
	Male	31				
	Total	177				
Cleansing oil	Female	146	1448.50	-3.353	<0.001	**Yes**
	Male	31				
	Total	177				

These results support hypothesis H1 and are consistent with the literature, which emphasizes a more active involvement of women in care routines and the use of specialized cosmetics. For the other product categories, i.e., soap and shower gel, no significant differences were identified, suggesting a relatively uniform use between genders, possibly influenced by their basic, functional character, less associated with aesthetic rituals or advanced care.

Hypothesis **H1**: *There are significant differences between genders in terms of the frequency of use of cosmetic products* is **partially confirmed**. Gender influences the frequency of use for certain cosmetic products, especially those associated with specific care and dermatocosmetics, but not for general hygiene products.

To test hypothesis **H2:** *Monthly income influences the choice of cosmetic product brands*, the Spearman correlation coefficient was used, considering it appropriate for analyzing the relationships between an ordinal variable (monthly income) and a rank-type variable (brand preference).

The results indicate a statistically significant positive correlation between income and brand choice for the following products: micellar water ($\rho = 0.462$, $p = 0.032$), soap ($\rho = 0.548$, $p = 0.027$), shower gel ($\rho = 0.328$, $p = 0.024$), shampoo ($\rho = 0.360$, $p = 0.047$) and body/face moisturizer ($\rho = 0.595$, $p = 0.015$). These significant correlations suggest that

people with higher incomes tend to choose better-known or premium brands in these categories. For products such as cleansing oil, the correlation is not statistically significant, but in the case of oil, an increasing trend towards significance is observed (p = 0.094), which could be confirmed with a larger sample. Fig. 4 visually highlights the intensity of the statistically identified relationships between the analyzed variables.

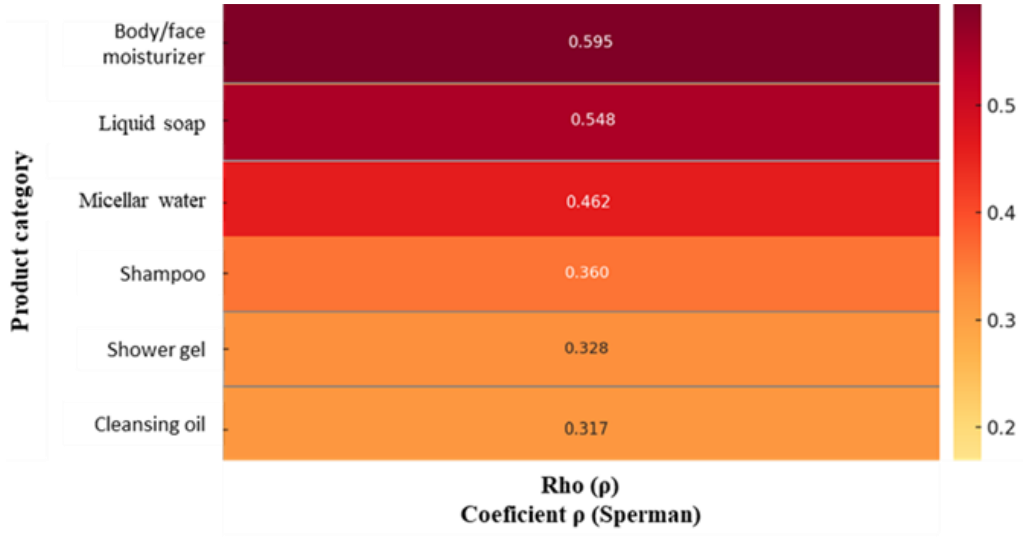

Figure 4. Spearman coefficient correlation diagram.

Therefore, hypothesis **H2 is confirmed**, and the results support the idea that monthly income has an impact on purchasing behavior, especially regarding brands associated with personal care cosmetics (Table 5).

Table 5. Spearman test between monthly income and cosmetic brands included in the study.

			Micellar water	Liquid soap	Shower gel	Shampoo	Body/face moisturizer	Cleansing oil	Income
Spearman's rho	**Micellar water**	Correlation Coefficient	1.000	0.105	0.038	0.092	0.058	0.103	0.462
		Sig. (2-tailed)		0.062	0.082	0.306	0.029	0.059	0.032*
	Liquid soap	Correlation Coefficient		1.000	0.200*	0.056	0.262**	0.227*	0.548
		Sig. (2-tailed)		.	0.012	0.080	0.001	0.031	0.027*
	Shower gel	Correlation Coefficient			1.000	0.175*	0.105	0.004	0.328
		Sig. (2-tailed)			.	0.023	0.191	0.975	0.024*
	Shampoo	Correlation Coefficient				1.000	0.268**	0.187	0.360
		Sig. (2-tailed)				.	0.001	0.126	0.047*
	Body/face moisturizer	Correlation Coefficient					1.000	0.388**	0.595*
		Sig. (2-tailed)					.	0.001	0.015
	Cleansing oil	Correlation Coefficient						1.000	0.317
		Sig. (2-tailed)						.	0.094
	Income	Correlation Coefficient							1.000
		Sig. (2-tailed)							.

To verify the association between the age of the participants and the main motivation for using cosmetic products, specific variables **H3**: *Consumers' age is associated with the main motivation for using products (e.g., hydration, treatment, perfume)*, a Chi-square test of independence was applied. The result obtained in the case of micellar water ($\chi^2 = 34.006$, df = 35, p = 0.516) indicates a lack of statistically significant association between the two variables, as the p-value is above the significance threshold of 0.05 (Table 6).

Table 6. Chi-Square test between participants' age and motivation for using cosmetic products.

Product	Chi-Square Tests	df	Approximate significance	Semnificativ statistic
Micellar water	34.006	35	0.516	No
Liquid soap	11.858	20	0.921	No
Shower gel	11.628	25	0.989	No
Shampoo	30.857	30	0.422	No
Body/face moisturizer	48.979	35	0.059	Slightly significant
Cleansing oil	28.746	35	0.765	No

The same statistically insignificant result is obtained for the other product categories, except for body/face moisturizer, where a weakly significant correlation can still be observed. To highlight this trend, the *Crosstab* data are presented in Table 7, which illustrates the distribution of reasons for using body/face moisturizer related to age groups.

The contingency table (Table 7) highlights the distribution of motivations for using the body/face moisturizer among participants, depending on the age group. It is observed that the age groups 36–45 years and 46–55 years are the ones that show a greater diversification of reasons for use, ticking categories such as hydration, skin protection, and treatment in notable proportions, while the groups <25 years are mainly oriented towards hydration or routine hygiene. The distribution of responses among those over 35 years of age indicates a more complex and clinically or functionally motivated cosmetic behavior, compared to young people, where aspects such as routine or occasional use prevail. The age category 36–45 years presents the greatest motivational variety.

Table 7. Crosstab between age and reasons for using cosmetics.

Age [years]	Daily routine/hygiene	Clean	Skin protection	Reducing imperfections	Freshness/ Fragrance	Hydration	Treatment	Does not use
<18	3	0	1	1	0	2	1	3
18–25	8	1	7	0	1	3	0	0
26–35	5	0	1	2	0	6	1	3
36–45	29	3	12	2	2	15	4	1
46–55	20	3	17	3	1	8	0	1
>55	5	1	1	0	0	1	0	0
Total	**70**	**8**	**39**	**8**	**4**	**35**	**6**	**8**

In conclusion, **hypothesis H3 is not confirmed based** on the analyzed data, and the test result should be interpreted with caution. To improve statistical accuracy, it is recommended to recode the age categories and motivation options so as to reduce the number of cells with low frequencies and allow a more robust analysis.

The following hypothesis aimed to identify **H4**: *The level of satisfaction with the quality/price ratio differs depending on the type of used product*, and in this case, the non-parametric Kruskal-Wallis test was performed. The obtained results (Table 8) indicate that for all product categories analyzed, from cleansing and care products to oral treatment and

hygiene, there are statistically significant differences between the groups ($p < 0.05$ in all cases).

Table 8. Kruskal-Wallis test.

	Micellar water	Liquid soap	Shower gel	Shampoo	Body/face moisturizer	Cleansing oil
Kruskal-Wallis H	12.156	10.481	14.692	16.701	13.214	10.987
df	4	4	4	4	4	4
Asymp. Sig.	0.015	0.023	0.004	0.002	0.009	0.027

These results **validate hypothesis H4**, according to which the perception of the quality/price ratio is influenced by the subtype or brand used within each category. In other words, consumers do not uniformly evaluate quality regarding the price, but develop differentiated preferences, reflected in a variable level of satisfaction depending on the chosen product.

To validate hypothesis **H5**: *Consumers who frequently use cosmetic products are more loyal to the chosen brands*, a central *Crosstab* table was created (Table 9), in which the analyzed product categories are integrated. This approach highlights the relationship between the intensity of use and the loyalty behavior of consumers, allowing the application of the Chi-square test of independence to evaluate the statistical significance of the association between the two variables.

Table 9. Crosstab on usage frequency and loyalty for cosmetics.

	Frequency	Loyalty			Total
		Change brands quite often	It is loyal to the cosmetics brand	Rare	
Frequency of using micellar water	2-3 times daily	1	7	3	11
	daily	10	26	57	93
	2-3 times weekly	6	8	12	26
	weekly	1	2	4	7
	2-3 times per month	0	0	1	1
	monthly	2	0	1	3
	does not use	8	10	19	37
Frequency of liquid soap use	2-3 times daily	16	22	56	94
	daily	12	29	38	79
	2-3 times weekly	0	1	0	1
	weekly	0	1	1	2
	2-3 times per month	0	0	0	0
	monthly	0	0	0	0
	does not use	0	0	2	2
Frequency of shower gel use	2-3 times daily	5	8	10	23
	daily	21	37	75	133
	2-3 times weekly	1	7	7	15
	weekly	0	0	1	1
	2-3 times per month	0	0	0	0
	monthly	0	0	0	0
	does not use	1	1	4	6
Frequency of shampoo use	2-3 times daily	1	3	0	4
	daily	3	14	11	28
	2-3 times weekly	18	23	70	111
	weekly	6	12	16	34
	2-3 times per month	0	1	0	1
	monthly	0	0	0	0
	does not use	0	0	0	0

	Frequency	Loyalty			Total
		Change brands quite often	It is loyal to the cosmetics brand	Rare	
Frequency of body/face moisturizer use	2-3 times daily	7	11	19	37
	daily	17	26	64	107
	2-3 times weekly	3	12	6	21
	weekly	0	1	1	2
	2-3 times per month	0	0	2	2
	monthly	0	0	1	1
	does not use	1	3	4	8
Frequency of cleansing oil use	2-3 times daily	2	1	1	4
	daily	4	14	28	46
	2-3 times weekly	8	10	25	43
	weekly	0	3	0	3
	2-3 times per month	0	0	2	2
	monthly	14	25	41	80

The results of the Chi-square test, applied to each cosmetic category, are presented in Table 10 and indicate the extent to which there is a statistically significant association between usage frequency and brand loyalty, thus contributing to the validation of the formulated hypothesis. The obtained data indicate that for *rinse-off/wash-off* and *leave-on* cosmetic categories, statistically significant values ($p < 0.05$) were obtained.

Thus, the hypothesis that frequent use of products is associated with increased brand loyalty is confirmed, suggesting that routine use contributes to strengthening consumer loyalty in the cosmetic and dermatocosmetic industry.

Table 10. Chi-Square cosmetic usage frequency and brand loyalty.

Product	Chi-square (χ^2)	Df	p-value	Semnificativ statistic
Micellar Water	14.621	12	0.026	Yes
Soap	11.384	8	0.033	Yes
Shower Gel	13.002	8	0.041	Yes
Shampoo	18.328	8	0.019	Yes
Body/face moisturizer	17.114	12	0.031	Yes
Cleansing oil	16.483	10	0.024	Yes

4. CONCLUSIONS

This research aimed to analyze the behavior of consumers of cosmetic and dermatocosmetic products, focusing on factors such as frequency of use, brand loyalty, and level of satisfaction with the quality/price ratio. By applying a structured survey and statistical analysis of the obtained responses, several relevant conclusions could be drawn, such as: *(i)* cosmetic products are used frequently, especially those for cleaning and care; *(ii)* frequency of use differs according to gender, age and income, which shows us that cosmetic preferences are not universal, but are related to lifestyle and individual needs; *(iii)* in the case of some products, such as shampoo or body/face moisturizer, satisfaction related to quality/price varies significantly between users, which indicates the existence of some brands perceived as more "*valuable*" than others. An important conclusion highlighted that, with the frequent use of certain product brands, in most cases, it leads to loyalty to that brand. The more often people use a certain type of product, the less willing they are to change it. This pattern was statistically confirmed across the analyzed categories, indicating that consumption habits are consolidated over time. Like any research, this study has certain limitations, primarily because

it relies on perceptions and self-reports, which can affect the objectivity of some responses. However, the data provides a consistent overview of consumer behavior and allows for practical applications..

Based on the behavioral results obtained, the next phase of the research will involve qualitative and physicochemical analyses of the cosmetic products frequently used by participants. This future phase will include: *(i)* identifying the presence of microplastics in the compositions of selected products; *(ii)* correlating laboratory results with behavioral data; and *(iii)* analyzing the potential impact on human health and the environment.

REFERENCES

[1] Loretz, L. J., Api, A. M., Babcock, L., Barraj, L. M., Burdick, J., Cater, K. C., Jarrett, G., Mann, S., Pan, Y. H. L., Re, T. A., Renskers, K. J., Scrafford, C. G., *Food and Chemical Toxicology*, **46**(5), 1516, 2008.

[2] Loretz, L. J., Api, A. M., Barraj, L. M., Burdick, J., Derssler, W. E., Gettings, S. D., Hsu, H. H., Pan, Y. H. L., Re, T. A., Renskers, K. J., Rothenstein, A., Scrafford, C. D., Sewall, C., *Food and Chemical Toxicology*, **43**(2), 279, 2005.

[3] Hossain, S., Islam, T., Babu, A., Moon, M., Mim, M., Ul Alam, T., Bhattacharjee, A., Sultana, S., Akter, M., *Cleaner and Responsible Consumption*, **17**, 100277, 2025.

[4] Sahlabgi, A., Lupuliasa, D., Stanciu, G., Lupsor, S., Vlaia, L. L., Rotariu, R., Predescu, N. C., Radulescu, C., Olteanu, R. L., Stanescu, S. G., Hincu, L., Mititelu, M., *Gels*, **11**(3), 149, 2025.

[5] Banica, A. L., Bucur (Popa), R. M., Dulama, I. D., Bucurica, I. A., Stirbescu, R. M., Radulescu, C., *Scientific Study and Research Chemistry and Chemical Engineering, Biotechnology, Food Industry*, **24**(2), 155, 2023.

[6] Kouassi, M. C., Grisel, M., Gore, E., *Colloids and Surfaces B: Biointerfaces*, **217**, 112676, 2022.

[7] Gunt, H., Bees, B., Draelos, Z. D., *Journal of the American Academy of Dermatology*, **79**(3), 7587, 2018.

[8] Hanifin, J. M., Cooper, K. D., Ho, V. C., Kang, S., Krafchik, B. R., Margolis, D. J., Schachner, L. A., Sidbury, R., Whitmore, S. E., Sieck, C. K., Van Voorhees, A. S., *Journal of the American Academy of Dermatology*, **50**(3), 391, 2004.

[9] Devillers, A. C., Oranje, A. P., *British Journal of Dermatology*, **154**(4), 579, 2006.

[10] Callen, J., Chamlin, S., Eichenfield, L. F., Ellis, C., Girardi, M., Goldfarb, M., Hanifin, J., Margolis, D., Paller, A. S., Piaquadio, D., Peterson, W., Kaulback, K., Fennetry, M., Wintoub, B. U., *British Journal of Dermatology*, **156**(2), 203, 2007.

[11] Bucur (Popa), R. M., Radulescu, C., Dulama, I. D., Stirbescu, R. M., Bucurica, I. A., Banica, A. L., Stanescu, S. G., *Toxics*, **13**(5), 354, 2025.

[12] Timpanaro, G., Cascone, G., *Heliyon*, **11**(3), e42233, 2025.

[13] Vaillancourt, E., Mohamed, A. A., Ansell, J., Ashikaga, T., Ayad, A., Ayman, H., Campos, M. V., Chien, H. S., Juisti, A., Hato, M., Hill, F., Khattaba, A., Kreiling, R., Lee, A. Y., Li, M., Lin, P., Lin, Y. C., Mencarelli, V., Miltein, S., et al., *NAM Journal*, **1**, 100020, 2025.

[14] Banica, L. A., Radulescu, C., Dulama, I. D., Bucurica, I. A., Stirbescu, R. M., Stanescu, S. G., *Foods*, **13**(19), 3069, 2024.

[15] Banica, A. L., Radulescu, C., Stirbescu, R. M., Dulama, I. D., Bucurica, I. A., Stanescu, S. G., Stirbescu, M. N., *UPB Scientific Bulletin - Series B Chemistry and Materials Science*, **86**(4), 85, 2024.

[16] Banica, A. L., Radulescu, C., Dulama, I. D., Bucurica, I. A., Stirbescu, R. M., Stanescu, S. G., *Journal of Science and Arts*, **24**(1), 223, 2024.
[17] Barabasz, W., Pikulicka, A., Wzorek, Z., Nowak, A. K., *Technical Transactions*, **12**(116), 99, 2019.
[18] Wirtu, Y. D., *Frontiers in Environmental Science*, **12**, 1402893, 2024.
[19] Dlamini, S., Mahowa, V., *Cleaner and Responsible Consumption*, 13, 100190, 2024.
[20] Selevec, J., Tiggemann, M., *Psychology of Women Quarterly*, **34**(1), 65, 2010.
[21] Luo, G., Wu, Z., Xie, Z., *Food and Chemical Toxicology*, **197**, 115273, 2025.
[22] Alosyli, F., Aljebrin, L., Alnowaiser, N., Alodhilah, Y., Ibrahim, N., Anaam, M. S., Farooqui, M., Alsahail, S., Elghazaly, A., Almogbel, Y., Alsuhibani, A., *Open Public Health Journal*, **17**, e18749445350785, 2024.
[23] Bilal, M., Mehmood, S., Iqbal, H. M. H., *Cosmetics*, **7**(1), 13, 2020.
[24] Graham, J. A., Kilgman, A. M., *International Journal of Cosmetic Science*, **7**(2), 85, 1985.