

Knowledge and attitude of Lebanese women about cosmetics: a cross-sectional survey

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ABSTRACT

Background: The Middle East and North Africa region, including Lebanon, is well known for its excessive cosmetics expenditure. While the use of beauty products is increasing, it is unclear if customers are aware of the products' safety and proper use.

Objective: To explore Lebanese women's knowledge and attitudes toward cosmetics use.

Methods: A cross-sectional study was conducted from January to May 2021 among a sample of adult Lebanese women. Data were collected using an electronic questionnaire divided into 3 sections (sociodemographic characteristics, cosmetics knowledge, and attitude) and shared via social media platforms. Knowledge and attitude scores were then calculated. Descriptive and regression analysis was performed using Statistical Package for the Social Sciences. *P* value < .05 was considered statistically significant.

Results: A total of 1,051 females completed the survey, and the age range of the majority 744 (70.8%) was between 18 and 20 years. The mean score of participants' knowledge was 7.54 ± 2.7 (range 0–14) with 658 (62.6%) of the respondents being knowledgeable about cosmetics. The study sample exhibited an overall positive attitude toward cosmetics. A significant association was observed between the area of residency and monthly income of respondents and their knowledge toward cosmetic products (*P* < .001).

Limitations: The self-administered questionnaire may have resulted in information bias and it targeted only those having internet access, and the age group 18 to 20 years was overrepresented.

Conclusion: The study sample demonstrated a good level of knowledge as well as a positive attitude toward cosmetics. However, raising awareness on the acute and chronic side effects of cosmetics is warranted.

Keywords: attitude, cosmetic products, knowledge, Lebanon, women

Introduction

For the last 10,000 years, people have utilized various products to enhance their appearance.¹ As a consequence of modernization and increasing beauty concerns, cosmetic products have become a daily life necessity for men and women, leading to a booming of the beauty market at a rate of 5.3% each year around the globe.² Cosmetic products, according to the Federal Food, Drug, and Cosmetic Act, are defined as "articles intended to be rubbed, poured, sprinkled, sprayed on, introduced into, or applied to the human body or any part thereof for cleansing, beautifying, promoting attractiveness, or altering the appearance" without affecting structure or function, encompassing skincare, makeup and camouflage, nail, hair, and body products.³

Typically, cosmetic products are synthetic, natural compounds, or a combination of both.⁴ Their use varies depending on the population's background; younger generations typically use them for aesthetic reasons, whereas older generations typically use them for antiaging.⁵ With the increasing use of cosmetics, Arab countries in the Middle East and North Africa (MENA) region today have one of the fastest-growing beauty marketplaces, which was valued at 33 billion United States dollars (USD) in 2021 and is forecasted to reach 39 billion USD by 2025.^{6,7} The top 3 highly used cosmetics among the variety of other products include perfumes, makeup, and skincare.⁸

Cosmetics are typically used to enhance the appearance and improve the user's quality of life, but their use has been linked

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What is known about this subject in regard to women and their families?

- Cosmetics are widely used, especially in the Middle East and North Africa, including Lebanon.
- Cosmetic use can result in a variety of adverse effects, ranging from mild local reactions to systemic reactions.

What is new from this article as messages for women and their families?

- Knowledge about cosmetic products was significantly associated with the area of residency and monthly income of respondents.
- There is a need to raise women's knowledge in Lebanon about the possible adverse effects of cosmetics and the correct skincare routine.

to several adverse effects ranging from local responses, such as irritation, erythema, burning sensation, and urticarial rash to systemic reactions.^{9–11}

Moreover, many studies have proved that some cosmetics were contaminated with toxic heavy metals, such as lead and cadmium, that pose a serious danger on human health, ranging from neurotoxicity to carcinogenicity.¹² Furthermore, there is growing scientific concern about the composition and safety of chemicals used in the cosmetics industry because of their potential to disrupt the endocrine system.^{13,14} Many compounds, including parabens, phthalates, and ultraviolet filters, have been shown to have the potential to disrupt the endocrine system and affect the reproductive health of users.^{15,16}

According to previous studies, certain cosmetics users are willing to deal with a minor negative effect as long as it improves appearance, such as experiencing tingling in the lips after applying lipstick that temporarily makes the lips larger.^{17,18} In a survey conducted in 2006 in Italy, 25% of cosmetic users reported negative cosmetic-related effects; more than half of those women did not seek medical attention, and only a limited number consulted a pharmacist.^{11,19}

Following the COVID-19 pandemic and the current Lebanese economic crisis, the cosmetics market has shifted dramatically away from internationally recognized brands with high-quality standards toward lower-quality products, raising the risk of additional health concerns. In Saudi Arabia, an inadequate level of knowledge about the adverse effects of cosmetics has been recently reported.¹⁷ Moreover, Lebanese women were found to be poorly knowledgeable about nail cosmetics' hazardous effects, despite the fact that they are heavy consumers.²⁰ We, therefore, conducted this study to evaluate Lebanese women's knowledge and attitudes toward cosmetics in light of the unexpected results reported earlier.

Methods

Study design and population

A cross-sectional online-based study was conducted from January to May 2021 among adult women across all the Lebanese districts (Beirut, Mount Lebanon, Bekaa, North Lebanon, and South Lebanon) using the snowball technique to explore their attitudes and knowledge toward cosmetics.

Procedure

An online questionnaire was created using Google Forms and distributed via different social media platforms, including Facebook, Instagram, and WhatsApp. All participants were asked to read an explanatory statement outlining the survey's goals and objectives, ensuring that all information provided would be kept strictly confidential, and they provided electronic consent before completing the survey. The study was conducted anonymously and voluntarily, and women received no compensation for their participation. The respondents completed the questionnaire in an average of 10 minutes.

Sample size

A recent ruling recommends the use of a simple formula: $n = 100 + 50 (i)$, where i refers to the number of independent variables in the logistic regression model.²¹ We estimated that a sample size of more than 500 would be sufficient for the statistical analyses because we assumed that the current study would include 10 covariates.

Questionnaire

The questionnaire comprised 3 sections with a total of 28 questions (Supplementary questionnaire, <http://links.lww.com/IJWD/A19>).

In the first section of the survey, participants' sociodemographic details, such as age, area of residency, highest educational attainment, social status, occupation, and monthly income, were retrieved. The second section assessed the participants' knowledge of cosmetics. It included 14 multiple-choice questions related to cosmetics such as routine skin care, sunscreens, hair dyeing, and side effects of cosmetics; its reliability was reported as 0.76 using Cronbach's alpha. Correct answers were coded as 1 and incorrect answers as zero; participants who scored $\geq 8/14$ were classified as knowledgeable. The third section identified the participants' attitudes toward cosmetics through 8 attitudinal statements using a 5-point Likert scale (1: strongly disagree, 5: strongly agree); its reliability was reported as 0.69 using Cronbach's alpha. The knowledge and attitude questions were adapted from a previous study.¹⁰ The questionnaire was translated from English into Arabic by certified translators in Lebanon, and a forward-backward-forward translation method was used to ensure accuracy and clarity.

Statistical analysis

The collected data was converted and analyzed using Statistical Package for the Social Sciences version 26 (IBM). The Kolmogorov-Smirnov test was used to determine the normality of the data distribution. In the descriptive analysis, counts and percentages were used for categorical variables and means and standard deviations for continuous variables. The variables in the bivariate analysis that showed a P value < 0.2 were included in the regression model taking the dichotomized level of knowledge as the dependent variable. A P value $< .05$ was considered statistically significant.

Results

A total of 1,051 women agreed to participate, and their demographic characteristics are presented in Table 1. The age range of the majority of the participants 744 (70.8%) was between 18 and 20, and 919 (87.4%) were single. Similarly, the majority had a high school degree, as the highest education earned 656 (62.4%), and 806 (76.7%) were unemployed. Moreover, 317 (30.2%) earned a monthly income between 1.5 and 3 million Lebanese pounds.

Table 1
Participants' demographic characteristics [N = 1,051]

Characteristics	n (%)	
Age range (years)	18–20	744 (70.8)
	21–30	225 (21.4)
	>30	82 (7.8)
Area of residency	Bekaa	567 (53.9)
	North Lebanon	244 (23.2)
	South Lebanon	161 (15.3)
	Mount Lebanon	56 (5.3)
Marital status	Beirut	23 (2.2)
	Single	919 (87.4)
Highest education earned	Married	132 (12.6)
	High school	656 (62.4)
	Bachelor degree	248 (23.6)
	Postgraduate	101 (9.6)
	Elementary	30 (2.9)
Employment status	Grade 9	16 (1.5)
	Unemployed	806 (76.7)
	Employed	245 (23.3)
Monthly income (million Lebanese pounds)	Unemployed	806 (76.7)
	Employed	245 (23.3)
	<1.5	225 (21.4)
	1.5–3	317 (30.2)
Monthly income (million Lebanese pounds)	3–5	244 (23.2)
	>5	265 (25.2)

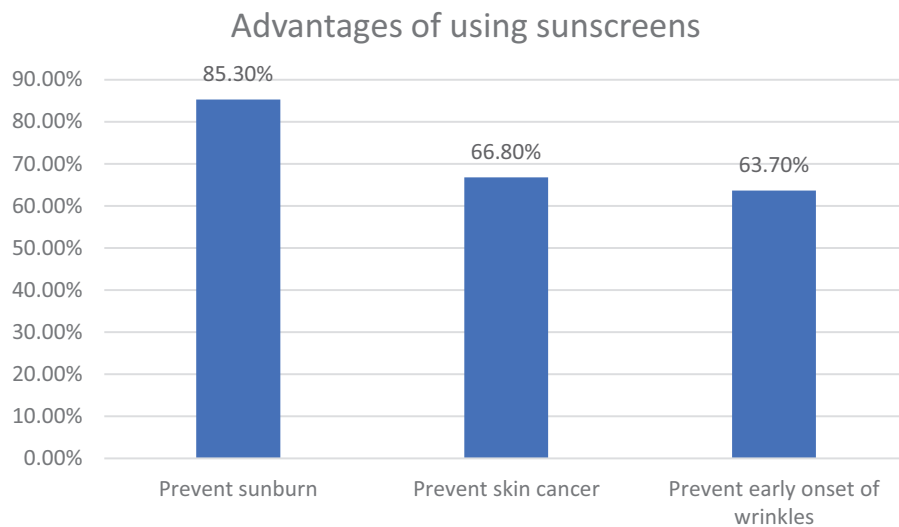


Fig. 1. Participants' responses to the benefits of using sunscreen question.

Figure 1 shows the response of participants toward the benefits of using sunscreen. The majority of the participants 897 (85.3%) believed that the primary advantage was to prevent sunburn. Table 2 depicts the knowledge of participants toward cosmetics. The majority of the participants 862 (82.6%) knew that the correct first step for cleansing the skin is by using the cleanser, 531 (50.5%) realized that perfume is the ingredient responsible for causing skin allergy, similarly, 539 (51.3%) knew that waterproof mascara is among the most harmful mascaras for eyelashes. Moreover, the majority 820 (78%) knew the appropriate time to apply sunscreen, which is 15–30 minutes before sun exposure. While 123 (11.7%) participants knew that dandruff is the most prevalent side effect of hair dye, 453 (43.1%) knew that color-depositing shampoo is the appropriate shampoo to be used after hair dyeing, and 415 (39.5%) knew that oily skin is the most appropriate skin type for cosmetic powders. The mean score of participants' knowledge was 7.54 ± SD 2.70 (95% confidence interval [CI] [7.38–7.71]), and 658 (62.6%) of the participants were classified as knowledgeable.

Table 3 shows the frequency distribution of participants' responses to the attitudinal items. Almost all of the participants 862 (82.1%) agreed that inappropriate use of cosmetics causes rashes, skin darkening, and wrinkles. Moreover, 839 (79.9%) were confident that herbal ingredients are safer and healthier to be used in cosmetics. On the other hand, only 429 (40.8%)

believed that tattoos cause cancer, whereas 569 (54.1%) considered using hair dyes during pregnancy and breastfeeding to be harmful, and 789 (75.1%) confirmed that using sunscreen as a daily routine should begin at a young age.

Table 4 shows the results of the bivariate analysis, where age, area of residency, marital status, and monthly income influenced the participants' knowledge with *P* value < .05. The logistic regression analysis model showed that the area of residency and monthly income influenced the participants' knowledge about cosmetics (5.31, 95% CI [2.06–13.70]; *P* = .001, and (2.11, 95% CI [1.42–3.13]; *P* < .001, respectively).

Discussion

This study is the first of its type to thoroughly examine the knowledge and attitudes of Lebanese women toward cosmetics. Knowing that a previous study conducted by Lteif et al.²⁰ concluded that Lebanese women are poorly knowledgeable about nail cosmetics hazardous effects, despite the fact they are heavy consumers. This unexpected finding prompted us to conduct this research.

In this survey, more than half of the women successfully answered 9 out of 14 knowledge questions. As a result, the participants may be regarded to be knowledgeable, comparable to a study conducted in Korea, where the majority of the

Table 2
Participants' responses to knowledge questions

Questions	Correct	Incorrect/do not know	Correct answer
First step for cleansing the skin	868 (82.6)	183 (17.4)	Cleanser
The most prevalent cause of skin allergy	531 (50.5)	520 (49.5)	Perfume
The most harmful mascaras for eyelashes	539 (51.3)	512 (48.7)	Waterproof
Mascaras should be discarded after	654 (62.2)	397 (37.8)	3–6 months
Advantages of using sunscreen in cosmetics	702 (66.8)	349 (33.2)	Skin cancer prevention
Sunscreen should be applied before sun exposure by	820 (78)	231 (22)	15–30 min
The most prevalent side effect of hair dyes	123 (11.7)	989 (88.3)	Dandruff
Appropriate shampoo after hair dyeing	453 (43.1)	598 (56.9)	Color deposit
Appropriate conditioner after hair dyeing	587 (55.9)	464 (44.1)	Deep mask
The most common side effect of cosmetics and pharmaceuticals on the skin	609 (57.9)	442 (42.1)	Skin irritation and sensitivity
Appropriate skin for using cosmetic powders	415 (39.5)	636 (60.5)	Oily
Cosmetics that have the most side effects on skin	748 (71.2)	303 (28.8)	Oil based
Side effects of nail polish	341 (32.4)	710 (67.6)	Yellow discoloration
Cosmetics harm the endocrine system	489 (46.5)	565 (53.5)	Yes

Table 3
Frequency distribution of participants' responses to attitude items

Item	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Inappropriate use of cosmetics causes rashes, skin darkening, and wrinkles	524 (49.9)	338 (32.2)	134 (12.7)	45 (4.3)	10 (1)
The quality of cosmetics is more important than the price	689 (65.6)	216 (20.6)	95 (9)	32 (3)	19 (1.8)
Herbal ingredients are safer and healthier	499 (47.5)	340 (32.4)	157 (14.9)	50 (4.8)	5 (0.5)
Tattoos cause cancer	224 (21.3)	205 (19.5)	429 (40.8)	126 (12)	67 (6.4)
Using hair dyes during pregnancy and breastfeeding is harmful	302 (28.7)	267 (25.4)	319 (30.4)	104 (9.9)	59 (5.6)
Using dye and decolorization may cause hair graying	282 (26.8)	363 (34.5)	291 (27.7)	91 (8.7)	24 (2.3)
Using sunscreen should begin at a young age	534 (50.8)	255 (24.3)	151 (14.4)	73 (6.9)	38 (3.6)
Water removes makeup	135 (12.8)	155 (14.7)	175 (16.7)	239 (22.7)	347 (33)

participants were aware of cosmetics use.²² In contrast, research findings from South Africa and Saudi Arabia revealed that women lacked knowledge about cosmetics.^{18,23}

Similar to the findings of Gupta's study²⁴, the vast majority of women in this study (88.7%) were unaware that dandruff is the most common side effect of hair dyes. Saudi women, in contrast, were aware of the negative effects of hair dyeing, but nevertheless, this has not deterred their high consumption patterns.²⁵ More than 60% of participants were unfamiliar with the side effects of nail polish; this percentage was higher, as previously reported by Lteif et al.²⁰

Conversely to the results of Upadhyay et al.²⁶, the majority of our participants demonstrated that they are fully aware of the first step in skincare, "cleansing the skin," the best time to apply sunscreen, and the most common adverse effects of cosmetics.

Furthermore, a substantial percentage of participants answered that the primary benefit of applying sunscreen is to prevent sunburns, and they were aware that the best time to apply it is 15–30 minutes before sun exposure. In a Malaysian study, however, 80.1% of respondents answered wrong about the optimal time to apply sunscreen.²⁷ Wang et al.²⁸ pilot survey in New Jersey discovered that a considerable percentage of the population knew all the benefits of sunscreen, from preventing sunburn to skin cancer, yet, contrary to our findings, the

majority of them did not know when to use sunscreen. In the present study, the majority of participants (86.2%) believed that cosmetic quality was important. Likewise, a study conducted in Nepal showed that consumers consider quality before price while buying cosmetics.²⁹

Contrary to previous findings, which found that consumers had a neutral attitude toward green cosmetics and believed that price and performance are the most important factors when choosing the best cosmetics, the majority of our participants (79.9%) claimed to trust cosmetics made from herbal components more than chemical-based ones.^{30–32}

Our research found no association between participants' educational attainment and their knowledge about cosmetics, which is consistent with studies from Iran and India.^{10,31}

Women in Lebanon rely primarily on friends, doctors, social media platforms, and beauty experts for information because subjects like these are not covered in the Lebanese educational system.

Additionally, it was found that the participants' degree of knowledge was directly influenced by their place of residence, with participants in rural areas showing lower levels of knowledge than those in urban areas. This demonstrates the value of having access to several sources of information. These findings were concordant with recent research that indicated there are no significant knowledge differences between rural and urban consumers.³²

Table 4
Association between the knowledge score and sociodemographic characteristics of the participants

Characteristics	Knowledgeable (n = 658) (n,%)	Un-knowledgeable (n = 393) (n,%)	P value	Logistic regression		
				β (SE)	OR (95% CI)	P value
Age	18–20	486 (73.9)	.001*	0.05 (0.17)	1.05 [0.74–1.49]	.74
	21–30	135 (20.5)				
	>30	37 (5.6)				
Residency	Beirut	9 (1.4)	<.001*	1.67 (0.48)	5.31 [2.06–13.70]	.001*
	North Lebanon	130 (19.8)				
	South Lebanon	125 (19)				
	Beqaa	357 (54.3)				
	Mount Lebanon	37 (5.6)				
Marital status	Single	593 (90.1)	.001*	–0.18 (0.29)	0.83 [0.47–1.47]	.53
	Married	65 (9.9)				
Education	Elementary	16 (2.4)	0.21	–	–	–
	Grade 9	6 (0.9)				
	High school	418 (63.5)				
	BS	154 (23.4)				
	Postgraduate	64 (9.7)				
Occupation	Unemployed	523 (79.5)	.006*	–	0.77 [0.55–1.07]	.122
	Employed	135 (20.5)				
Income (Lebanese pounds)	<1.5	128 (19.5)	.003*	0.74 (0.20)	2.11 [1.42–3.13]	<.001*
	1.5–3	197 (29.9)				
	3–5	143 (21.7)				
	>5	190 (28.9)				

BS, Bachelor of Science; CI, confidence interval; OR, odds ratio; SE, side effects.

*Statistically significant ($P < .05$).

Furthermore, those with higher income levels also showed to be more knowledgeable about cosmetics, which is consistent with earlier findings, suggesting better affordability and a tendency to spend more on cosmetics.³³ This finding can be attributed to the increasing attention of high-income consumers to laboratory testing and greater willingness to pay higher price for cosmetics and skincare products certified by the laboratory compared to those with lower income, as concluded by a recent study in Thailand.³⁴

Using a representative random sample, this study was the first to give insight into the Lebanese community's knowledge and attitude regarding cosmetics. However, there are certain limitations to this study. First, it is a cross-sectional survey, which does not allow us to establish causation between knowledge and other factors. Second, the fact that the data collecting form was performed online via a self-reported questionnaire may have resulted in information bias and it targeted only those having internet access, but this could not be avoided because of the COVID-19 pandemic. Third, the age group 18 to 20 years was overrepresented in this study. Fourth, despite the fact that men have recently become as good cosmetics consumers as women, this survey did not evaluate men's knowledge or attitudes regarding cosmetics.

Conclusion

Cosmetics are now an important part of every woman's daily needs, and they have become a life necessity as a result of their positive impact on consumer quality of life. The study sample demonstrated a high level of knowledge as well as a positive attitude toward cosmetics, and because social media platforms are a major source of information, more control over advertisements should be provided to reduce any unnecessary harm. Our findings emphasize the importance of educating Lebanese women about the acute and chronic side effects of cosmetics, as well as implementing the best skincare routine. It is important to recognize that women may have all of the necessary information and knowledge about appropriate cosmetics, but they may not have enough money to make the best choice for them, which is why more research is needed to study the economic crisis's impact on Lebanese cosmetics markets.

Conflicts of interest

None.

Funding

None.

Study approval

Ethical approval was provided by the institutional review board of the Lebanese International University, School of Pharmacy, Lebanon (Ref: 2021RC-004-LIUSOP).

Author contributions

BC contributed to the study conception and design. Data collection was performed by BC and LF. Data analysis was performed by VH and IG. The first draft of the manuscript was written by VH, SH, and IG, and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

Patient consent

Informed consent was obtained from all individual participants in the study, and participants signed an electronic consent regarding publishing their de-identified data.

Data availability

Data and other materials are available upon request from the corresponding author.

Supplementary data

Supplementary material associated with this article can be found at <http://links.lww.com/IJWD/A28>.

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