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Use Pattern of Personal Care Products: A Cross-Sectional National Survey

Zahra Karimi Majd[a], Mohammad Peikanpour[a*], Seyed Mostafa Ghasemi[a], Sajjad Esmaeili[a], Hamid Reza Rasekh[a], Rasoul Sadeghi[b], Mehdi Moeini[c], Alireza Salmanzadeh Aghdam[d]

a. Department of Pharmacoeconomics and Pharma Management, School of Pharmacy, Shahid Beheshti University of Medical Sciences, Tehran, Iran.
b. Department of Demography, University of Tehran, Tehran, Iran.
c. Department of Social sciences, university of Sistan and Baluchestan, Zahedan, Iran.
d. Department of pharmaceutical and food control, School of Pharmacy, Tabriz University of Medical Sciences, Tabriz, Iran.

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* **Corresponding Author:**
Mohammad Peikanpour
Email:
m_peikanpour@yahoo.com
and
m.peikanpour@sbmu.ac.ir

Abstract:

Personal care products are amongst the most consistently used goods in every population. To evaluate the market trends of these products in Iran, this study considers their use frequency, use prevalence, cross-sectional perceptions of retail brand loyalty, purchase location preferences, and sources, be them domestic or foreign.

Usage patterns of 125 types of personal care products were collected in over 2021 households in 8 cities of Iran by means of a checklist fill out. The strength of the study were the separation of data by socio-demographic factors such as gender, education level, economic status, occupational status, and level of religiosity.

Daily shampoo, bath soap, toothpaste, and face and hand moisturizer were the most frequent products used while the use of face and eye care products was less prevalent. The most repeatedly use-pattern was once-daily for sunscreens, moisturizers, lightnings, deodorants, toothpastes, mouth-washes, eye-care, anti-acne, and anti-chap products. Men and women with a higher economic status were more likely to use eye moisturizer, intense anti-acne-peeling, nourishing antiaging, cream soap, and body lotion/oil. Moreover, in all products studied, respondents prefer domestic over foreign ones except in deodorants and anti-perspirants. In addition, 42% and 29.8% of respondents prefer to purchase their personal care products from pharmacies and beauty shops, respectively.

Given the immense popularity of such products ,their impact on community health an consumers' preferences, results of this study can have far-reaching implications for manufacturing companies and health authorities in terms of developing strategies and regulations to optimize the use pattern of these products.

Keywords: Personal care products; Household survey; Use pattern

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1. Introduction

Personal care products are amongst the most commonly used products both by men and women often on a daily basis like tooth paste, deodorant, and soap. These products account for a considerable share of the household health expenditure. Development of a broad amount of manufactured products in the last decades and the progress in the personal care product industry have resulted in an increase in personal care products consumption. therefore the personal care industry recently become one of the most attractive industries in the world [1].

According to Beauty world middle east journal, The Middle East and African (MEA) beauty and personal

care market is estimated to be worth US$34.5 billion by 2021, with Iran being the seventh country in the world to record the consumption of personal care products and cosmetics with a market size of US$2.2 billion. The per capita consumption of personal cares in Iran is almost 3 times more than the global average. Overall, personal care products and cosmetics account for 4.5 percent of Iranian household expenditure, while the global average is 2.6 percent of household spending on personal cares [2,3].

Despite this, the lack of sufficient studies on the use patterns of personal care products can be seen and their use patterns have been examined for only a few countries (namely France, Switzerland, the USA, the Netherlands, and EU-15). Little wonder, then, our knowledge of the use of personal care products and customers' behavior in most countries is very scant [4,5]. Quantifying the variability of personal care product usage among individuals requires data collection in a population [6]. On the other hand, due to the expanding market of these products and increasing exposure to the ingredients of products through several ways such as dermal absorption, inhalation, and ingestion, reliable consumer data are needed to determine the health risks, proportionate with standards, and society budget impacts. To this end, it is necessary to know the relevant use pattern scenarios, including use prevalence, use frequency [7], purchase preferences, and consumer behavior .For more clarity, the difference between prevalence and frequency of use is that the first one means the consumer's use or non-use of the desired product, and the second one means the number of times of use. For instance, accurate data on the tendency to consume domestic or imported products and on the choice of the purchase location are inadequate, at best, and unavailable, at worst. Therefore, programs and plans in this area are inevitably based on limited valid information. According to this backdrop, a clear understanding of consumer behavior cannot be overemphasized. The personal care products market consists of several sectors which are complementary and satisfy all consumer needs and expectations regarding personal care, including hair care, skincare, body care, oral care, and hygiene products [8].

The aim of this study is to examine the use pattern of 125 types of commonly used personal care products amongst Iranian adults and probe the relationship among various demographic factors on the use pattern, cross-sectional perceptions of retail brand loyalty, purchase place, and choice of domestic or foreign products. The contributions of this study can be as follows. First of all, although Iran reportedly has the second-largest market in personal care products in the Middle East, the use pattern of these products are yet to be examined on a large scale so it could be fairly representative of the entire population. This study is the first of its kind embarking on this task. Secondly, unlike previous studies, a wider range of personal care products, as listed above, have been considered in this study. Finally, to achieve a more accurate market analysis, more comprehensive variables such as economic status, level of religiosity, and brand preferences have been examined for the purposes of this study.

2. Materials & Methods

2.1. Measurement instrument development

Besides the demographic profile of the respondents, 125 personal care products used by Iranians over 15 years of age have been taken into account in this survey. These number of products were chosen because they were commonly used by Iranian population according to market reports and online store's observations. The survey's structured paper-questionnaire with closed questions consists of several segments such as hair care, face and hand care, body care, general hygiene products (e.g., hand soaps and bath products), cleansers, and oral care products. Each page contained one sub-category with 4 to 16 different products and respondents answered questions regarding use prevalence (the percentage of study subjects using each product on any given day), the amount used per application, use frequency, brand name, purchase location, and domestic/foreign sources of each product they use, as dependent variables. The size or proportion of product consumption per application was visually investigated through a picture demonstration – the respondents were shown four pictures of an open hand with a circle on the palm indicating the amount of product consumption and asked which picture best represented their consumption amount. This information was used to transform the categorical respondent answers to numerical data. Regarding the expert opinion, the content validity of the used scale in the questionnaire was confirmed [9]. Based on this, experts in the hygienic product industry and academia were questioned about the comprehensiveness, clarity, and relativity of the instrument. Based on the data collected in the pilot study, the Cronbach's alpha was calculated to confirm the reliability of used scale in the questionnaire [10].

2.2. Sampling and data collection

The research population includes residents of eight provincial capitals. Trained interviewers collected the cross-sectional data of this country-wide studyfrom a total of 2021 households based on random sampling, from April to December ۲۰۱۹. For this purpose, clustered sampling method was employed; three regions in each city were selected; consequently, three main streets were randomly selected in any regions. According to the sample size, participants had been recruited randomly from each cluster and data were randomly collected from a number of homes. Considering the WHO sampling guidelines and Cochrane principles (11–13), the number of questionnaires distributed in Tehran, Mashhad, Shiraz, Ahvaz, Tabriz, Rasht, Zahedan, and Sanandaj was 695, 309, 245, 225, 198, 138, 112, and 100, respectively. Based on three cluster samplings, namely geographic area, ethnic distribution, and income levels of the population, the variability of use patterns across the country was examined.

2.3. Data analysis

According to the study design, differences in use prevalence, purchase location, and product sources were examined in terms of independent variables, including gender (male/female), age (in three groups, including younger adults [15-35], adults [35-55], and older adults [55 or above]), education (with/without a college degree), economic level and level of religiosity (both in high/medium/low levels), and occupational status (in six groups), using the Chi-square, Mann-Whitney, and Kruskal-Wallis tests based on statistical logic. Considering this is a cross-sectional survey, the authors described cross-sectional perceptions of retail brand loyalty by using the same brand in different products in a cross-sectional perception. Therefore, Pearson correlation coefficients were calculated among product categories to test brand loyalty (Biesterbos *et al.*, 2013). Based on use prevalence and frequency data, the correlations among independent and dependent variables were reported for selected products that consumers widely used. For a systematic error analysis, control variables were investigated to determine their effects on the correlations (15,16). In most cases, outliers were excluded in the data cleaning step. For statistically significant differences, a p-value less than 0.05 was considered, unless otherwise noted. All analyses were performed using SPSS 24.

3. Results & Discussion

3.1. Demographics

Once the contradictory, illegible, and incomplete answers were left out, the cleaned data base were whittled down to 1701 households from an initial 2021 potential participants, corresponding to a response rate of 84.2%. In the sample population, females were overrepresented (n=1160; 68.2%), this can be rooted in that women in households chose to answer the questionnaire. The mean age was 35; moreover, 57.3%, 37.5%, and 5.2% of the respondents were younger adults, adults, and older adults, respectively. Also, 51.2% of the respondents had a college degree. There were six different occupational statuses among the respondents, with 32.2%, 16.8%, 26.6%, 17.6%, 4%, and 2.9% of them being homemakers, students, full-time employees, part-time employees, jobless, and retired, respectively. Regarding the three levels of religiosity, 24.9%, 46.5%, and 28.7% of the respondents ranked low, medium, and high, respectively. Furthermore, 31.3%, 52.1%, and 16.6% of the population ranked low, medium, and high economically, respectively. There was no response bias due to geographical location, ethnicity, and income level.

3.2. Personal care product use patterns

The use frequency and the proportion of the population using personal care products were found to be different in each product category on a scale of eleven from “completely not used” to “used more than 4 times per day”. Consumption proportions were visually investigated for all 125 products through a picture demonstration; this was done for those products whose volume of consumption could be practically measured, and the time it took for those products to run out was considered. Of these, the 42 most used products were further analyzed. The use prevalence generally ranged from 2.5% (men’s hygienic gel) to 79.2% (bath soap) (Fig 1). As expected, several personal care products, e.g. shampoo, bath soap, toothpaste, and face and hand moisturizer, were widely used by adult participants, and the use of face and eye care products was less prevalent.

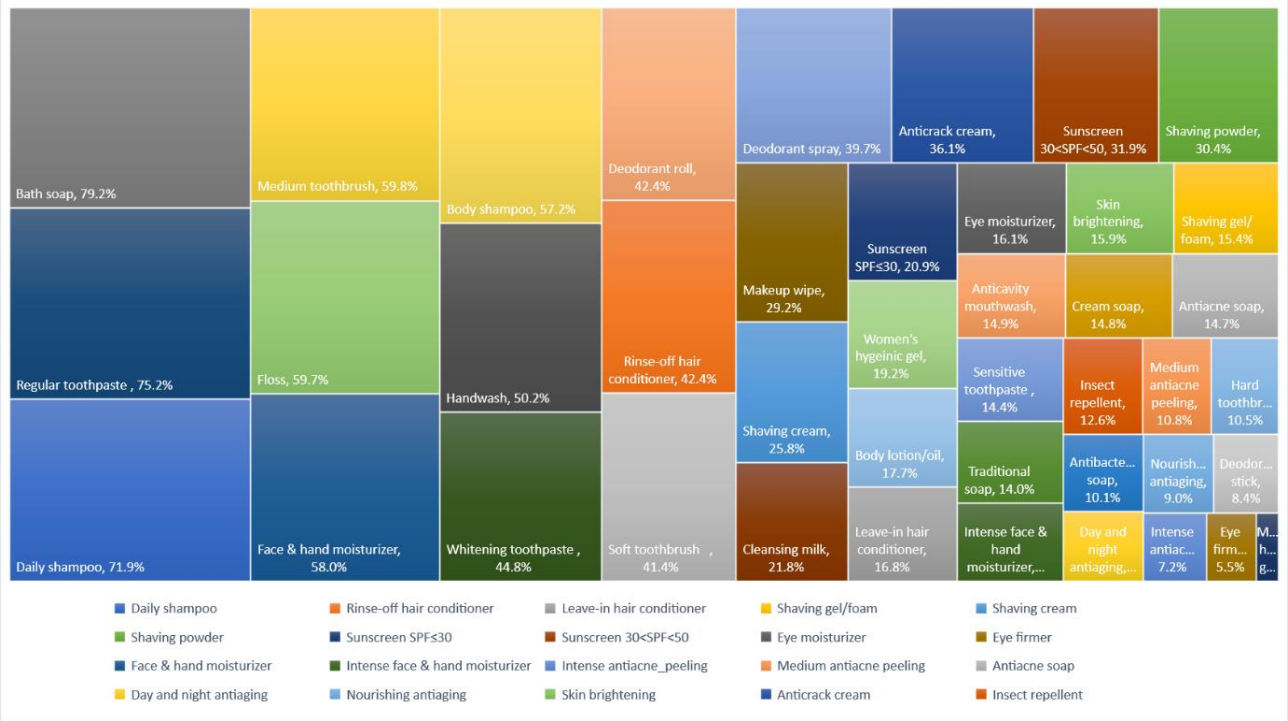

Figure 1. The use prevalence of personal care products.
P-value <0.05.

According to the results, the average amount of use per application for eye care cream, hand and face cream, hair conditioner, hair cream/serum/oil, hair shampoo, body lotion, toothpaste, and cold wax was 0.9, 3.3, 4.7, 4, 5.2, 5.4, 1.4, and 5.5 grams, respectively. Other body care products including brighteners, scrubs, body oils, and tanners were used at about 4.4 grams per application. Products such as armpit and groin lighteners, anti-stretch mark creams, face cleansers, and insect repellent creams averaged 4.1 grams each time. Hand and foot anti-crack creams, liquid hand wash, and hand disinfectant were each used at 4.3 grams per application. More than half the population (55.5%) used 10-20 cm of dental floss each time, with 31% of them using 20-30 cm. On the other hand, for products such as face and body soap, shaving powder, body splash, and antiperspirant rolls, the number of months it took them to run out was less than two months. Hair sprays, hair and eyebrow growing products, lip balm, biphasic eye cleansers, denture adhesive, sunscreen spray, and cold wax lasted less than three months.

The percentage of the population who used each product relative to the total number of the respondents in the same age group was evaluated. Younger adults were found more likely to use anti-acne and antibacterial soaps, whereas adults were more likely to use floss, deodorant spray, and day and night antiaging products. Older adults used hygienic products such as regular hand wash and traditional soap more; on the other hand, they used floss, shaving cream, body lotion/oil, and intense face and hand moisturizer less than the other age groups.

To further examine the use pattern variability, use prevalence was compared across independent variables. The distribution of the use pattern of most frequent personal care products is given in Table 1. The use prevalence in some personal care products among men and women was significantly associated with age, education level, occupational status, level of religiosity, and economic status, which are presented below.

Table 1. Use-pattern distribution of most frequent personal care products

	Product category	Product	Percentage of population who use this product	Most frequent use-pattern	Percentage of this use-pattern in user population	SD
1 & 2	Hair shampoo and conditioner	Daily shampoo	71.8	2-3 times weekly	43.0	3.3
		Anti-hair loss shampoo	23.1	2-3 times weekly	35.9	2.6
		Shampoo & conditioner	46.8	2-3 times weekly	42.9	3.2
		Rinse-off hair conditioner	43	2-3 times weekly	41.9	3.3
		Leave-in hair conditioner	17.3	2-3 times weekly	38.2	2.4
3	Shaving products	Shaving cream	26.3	Once a month	26.2	2.0
		Shaving powder	29	1-2 times a month	26.9	2.0
4	Solar products	Sunscreen SPF ≤30	21	Once a day	43.8	3.0
		Sunscreen SPF 30-50	31.5	Once a day	48.3	3.6
5	Eye care products	Eye moisturizer	16.7	Once a day	46.1	2.7
		Anti-wrinkle eye cream	16	Once a day	48.8	2.7
		Eye firmer	5.7	Once a day	33.3	1.6
6	Facial and hand moisturizing products	Face & hand moisturizer	58	Once a day	38.8	4.1
		Intense face & hand moisturizer	14.1	Once a day	32.6	2.7
7	Anti-acne products for face and body	Intense anti-acne peeling	7.4	2-3 times weekly	18.9	1.6
		Medium anti-acne peeling	11.2	2-3 times weekly	20.5	1.9
		Anti-acne soap	15.1	Once a day	31.1	2.5
8	Anti-aging and other facial, hand and foot care products	Day and night antiaging	9.1	Once a day	48.4	2.1
		Nourishing antiaging	9.5	Once a day	36.8	2.0
		Skin brightener	16.3	Once a day	36.2	2.6
9	Soaps	Bath soap	79.6	2-3 times weekly	41.7	3.0
		Cream soap	15.4	2-3 times weekly	27.9	2.5
		Antibacterial soap	10.5	Once a day	28.6	2.1
		Traditional soap	13.2	2-3 times weekly	25.8	2.2
10	Antiperspirants and deodorants	Deodorant spray	40.8	Once a day	38.2	3.9
		Deodorant roll	43.2	Once a day	42.1	3.9
		Deodorant stick	9	Once a day	32.2	2.0
		Body splash	54.4	Once a day	39.0	4.1
11	Body care products	Body shampoo	58.6	2-3 times weekly	45.2	3.4
		Body lotion/oil	18.4	2-3 times weekly	34.2	2.5
		Anti-crack cream	36.6	Once a day	31.4	3.3
		Insect repellent	12.8	Less than 5 times a year	20.3	1.7
12	Hygienic and skin cleanser products	Women's hygienic gel	19.8	2-3 times weekly	28.8	2.5
		Men's hygienic gel	2.4	Once a week	25.0	0.9
		Cleansing milk	22.2	Once a day	33.3	2.8
		Hand-wash	50.4	More than 4 times a day	48.8	4.7
		Makeup wipe	29.5	Once a day	37.6	3.3
13	Toothpastes	Regular toothpaste	75.6	Once a day	43.7	3.7
		Whitening toothpaste	45.5	Once a day	38.2	3.9
		Sensitive toothpaste	15.2	Once a day	36.8	2.7
14	Mouthwashes and other oral care products	Anti-cavity mouthwash	15.8	Once a day	36.7	2.4
		Soft toothbrush	42.5	Once a day	44.7	4.1
		Medium toothbrush	59.7	Once a day	41.7	4.2
		Hard toothbrush	10.8	Once a day	44.4	2.4
		Floss	60	Once a day	43.2	4.0

3.2.1. Use patterns vis-à-vis economic status

Men and women with a higher economic status were more likely to use eye moisturizer, intense anti-acne peeling, nourishing antiaging products, cream soap, and body lotion/oil. Men and women with a lower economic status were more likely to use face and hand moisturizer and regular toothpaste.

3.2.2. Use patterns vis-à-vis occupational status

People with different occupational status might use some personal care products more or less frequently; for example, respondents with full-time jobs tend to use shaving gel/foam, body shampoo, and floss more, and rinse-off hair conditioner less. Students were more likely to use leave-in hair conditioner, anti-acne soap, nourishing antiaging creams, deodorant rolls, body lotion/oil, whitening toothpaste, and medium toothbrushes, and less likely to use anti-crack cream. The homemakers used more of face and hand moisturizer and less of floss, while the retired respondents used more of shaving powder, anti-crack cream, bath soap, traditional soap, and soft toothbrushes and less of sunscreen, face and hand moisturizer, and anti-acne soap. Figure 2 gives a summary of all participants by their occupational status.

3.3. Use patterns vis-à-vis levels of religiosity

The use of personal care products moderately varied among men and women with different levels of religiosity. Men with a low level of religiosity were more likely to use leave-in hair conditioner, shaving cream, skin brightener, cream soap, deodorant spray, men's hygienic gel, cream soap, hand wash, and whitening toothpaste, while men with a higher level of religiosity were more likely to use daily shampoo, day and night antiaging, anti-crack cream, traditional soap, and soft toothbrushes. On the other hand, women with a low level of religiosity seemed to use more of rinse-off hair conditioner, sunscreen, anti-acne peeling, cream soap, deodorant spray, body shampoo, women's hygienic gel, cleansing milk, hand wash, medium toothbrush, and floss. Women with a high level of religiosity seemed to use more of products like shaving powder and skin brightener.

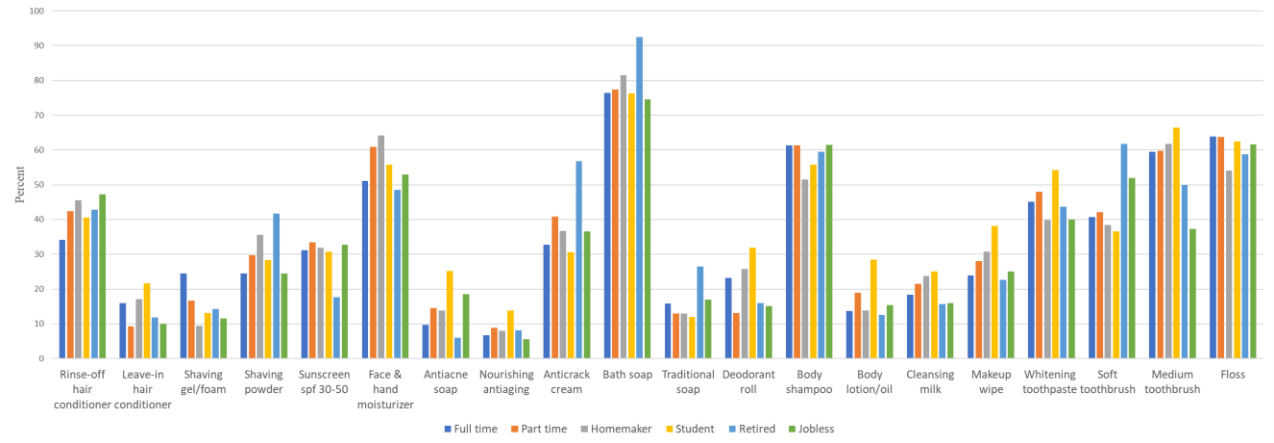

Figure 2. The comparison of usage by occupational status.
P-value <0.05.

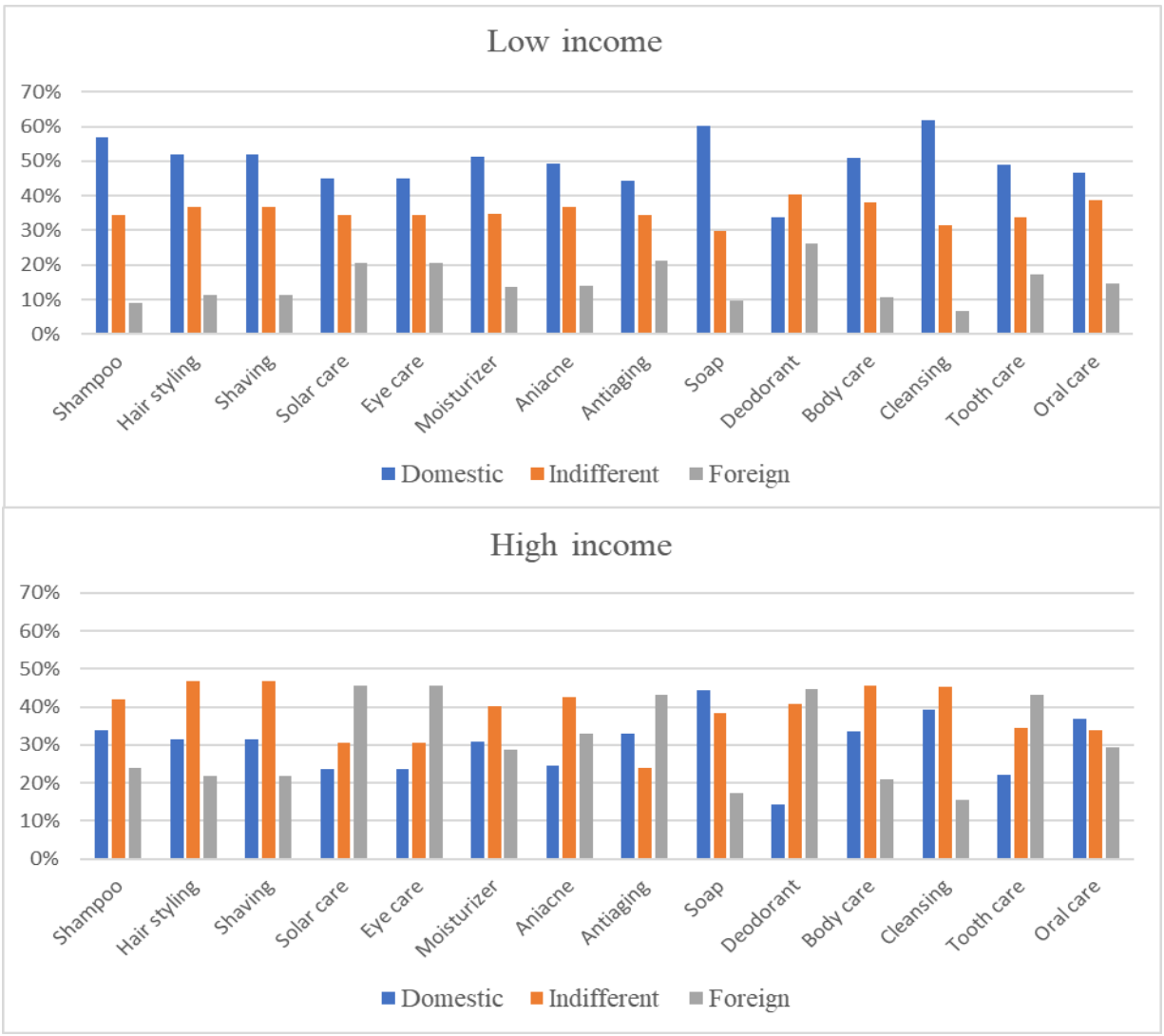

Figure 3. Domestic/foreign source preferences by economic status

3.4. Preference for domestic/foreign products vis-à-vis economic status

As shown in Figure 3, individuals' level of economic status plays a pivotal role in their preference for a domestic or foreign personal care product. Respondents with a lower level of economic status seemed to buy more domestically manufactured products, while those with a higher level of economic status seemed to be indifferent to the source of the products, and even in some cases of some products like solar products, eye care, antiaging, deodorants, and oral care products, they preferred imported products.

3.5. Preference for domestic/foreign products vis-à-vis education level

Having a college degree often gives the holder a competitive edge in earnings terms; hence, the respondents without a college degree were more likely to buy domestically produced products, while those with a college degree seemed to prefer foreign products like solar products, eye care, body care, and oral care products (Fig 4).

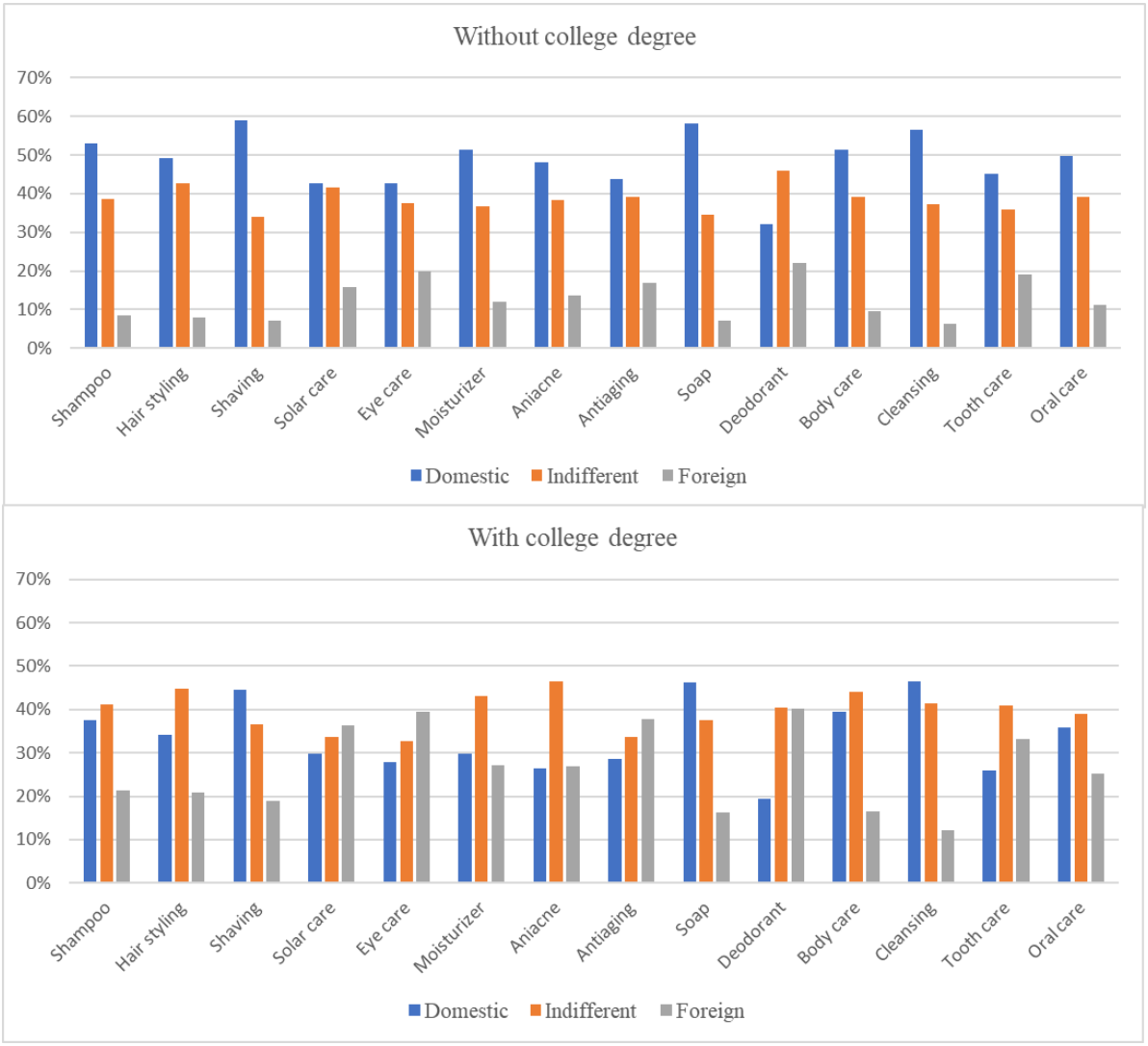

Figure 4. Domestic/foreign source preferences by education level.

3.6. Preference for domestic/foreign products vis-à-vis levels of religiosity

From a sociological perspective, religiosity provides marketers a basis for selecting their target markets and marketing strategies as it reflects people's behaviors, beliefs, and value systems to a large extent. The respondents with a lower level of religiosity seemed to be indifferent to the source of their products, and in some categories (namely shaving products and soaps) they seem to prefer domestic products, while the respondents with a higher level of religiosity seemed to prefer domestic personal care products in all categories except deodorants.

3.7. Preference for a purchase location vis-à-vis gender

Given fundamentally different shopping habits between men and women, differences could be seen in their favorite purchase locations. Figure 5 indicates that the women were more likely to buy most of their personal care products from beauty shops and pharmacies, while the men were more likely to buy them from pharmacies and hypermarkets. Online shopping was also found to be more popular with women than men.

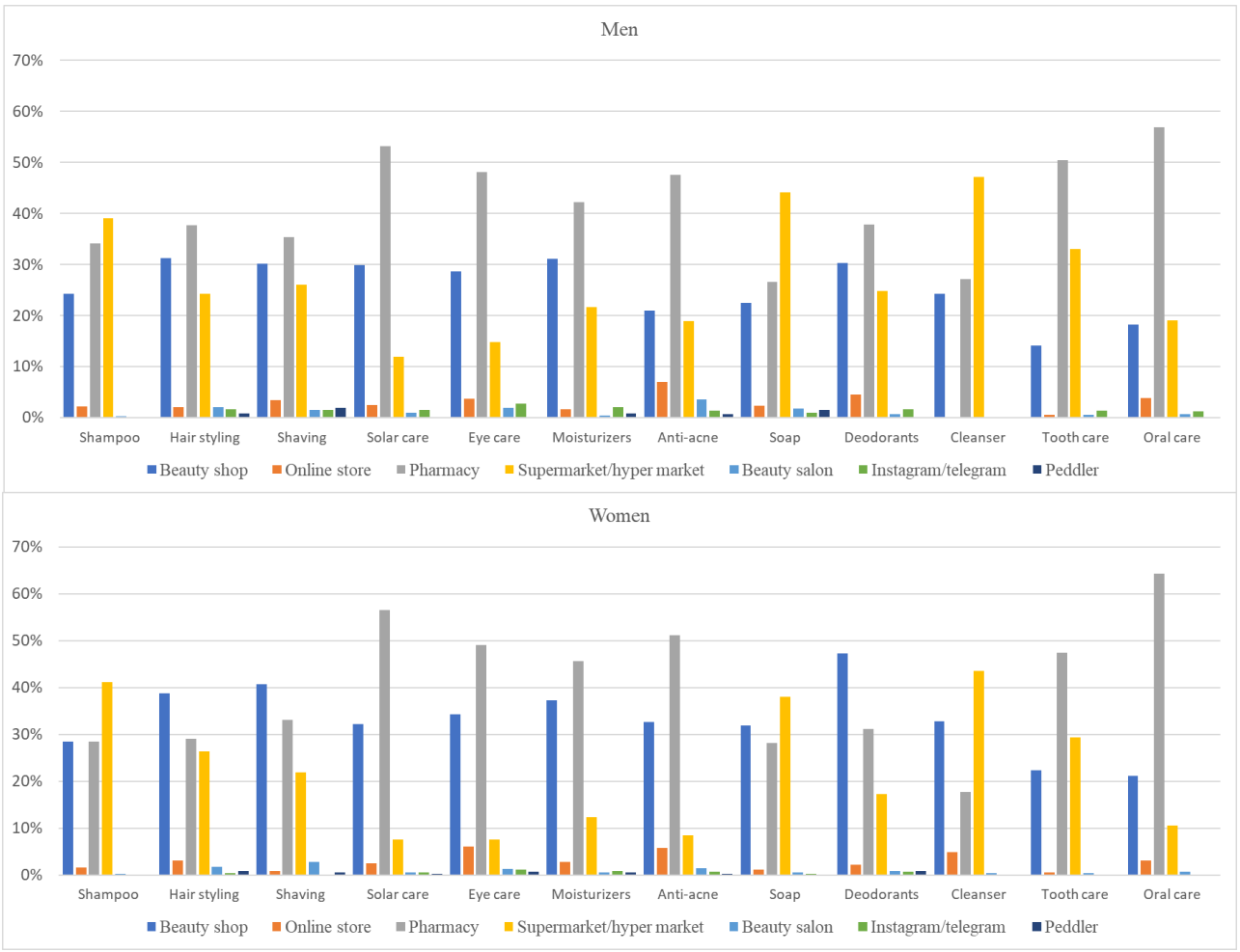

Figure 5. Comparison of place of purchase preferences by gender.
P-value <0.05

3.8. Product preference vis-à-vis cross-sectional perceptions of retail brand loyalty

Cross-sectional perceptions of retail brand loyalty were examined using the same brand of products in each product group, e.g. skincare, hair care, oral care, and hygienic products. Table 2 shows the correlations of similar brands in adults for 24 personal care products. Brands used in skincare products were correlated with each other (r = 0.41–1) with p-values less than 0.01, such as eye moisturizer, sunscreen SPF ≤30, and normal as well as intense face and hand moisturizer. Brands used in oral care products were correlated with each other (r=0.34-0.97) too, e.g., whitening toothpaste with regular toothpaste (r=0.34, $p < 0.01$) and sensitive toothpaste with both regular and whitening toothpaste (r=0.41 and 0.52, respectively, $p < 0.01$). Likewise, brands used in many hair care products were moderately correlated with each other (r = 0.17–0.4). Finally, a moderate correlation was seen in some skincare and hygienic product brands, e.g. body and hand lotion and face moisturizer.

Table 2. Product preferences regarding brand loyalty.

	Daily shampoo	Rinse-off hair conditioner	Leave-in hair conditioner	Shaving gel/foam	Shaving cream	Sunscreen SPF≤30	Sunscreen SPF 30-50	Eye moisturizer	Face & hand moisturizer	Intense face & hand moisturizer	Intense anti-acne peeling	Medium anti-acne peeling
Rinse-off hair conditioner	**0.178****											
Leave-in hair conditioner	0.147	**0.403****										
Shaving gel/foam	0.034	**0.359***	-0.252									
Shaving powder	-0.010	-0.105	0.172	-0.071	**0.353***							
Sunscreen SPF 30-50	-0.076	-0.015	0.111	0.286	-0.026	**0.926****						
Eye moisturizer	0.082	0.225	-0.105	0.308	0.178	**0.576****	**0.314***					
Eye firmer	0.323	-0.415	-0.100	-0.400	-0.200	**0.866***	0.144	**0.867****				
Intense face & hand moisturizer	0.263	0.286	0.157	-0.333	-0.174	0.075	-0.027	0.093	**0.419****			
Medium anti-acne peeling	0.096	0.030	-0.009	0.564	-0.469	0.434	-0.140	0.022	0.312	0.130	**0.921****	
Anti-acne soap	-0.131	0.297	**0.651***	-0.130	-0.198	0.505	-0.114	0.386	0.180	0.319	0.203	0.528
Nourishing antiaging	0.257	-0.287	-0.030	0.500			0.077	-0.302	0.057	0.330		0.598
Skin brightening		-0.024	-0.078	0.164	-0.118	**0.418***	0.060	**0.370***	0.136	-0.061	0.477	0.241
Cream soap	-0.016	-0.116	-0.085	**0.571***	0.052	-0.096	0.092	-0.108	0.003	0.220	0.493	**0.636***
Deodorant roll	0.003	-0.016	-0.001	-0.023	-0.027	-0.054	-0.042	0.068	0.084	-0.032	0.032	-0.016
Deodorant stick	-0.029	0.029	0.190	0.725	0.376	0.566	**0.573***	0.664	-0.231	-0.629		0.700
Body shampoo	**0.127***	0.119	0.081	0.132	0.020	-0.085	0.031	-0.139	0.054	**0.276***	0.185	-0.204
Body lotion/oil	0.142	0.237	**0.391***	-0.025	-0.356	0.025	0.022	0.382	0.182	0.380	-0.632	0.281
Women's hygienic gel	**0.249***	-0.025	0.334	-0.168	0.252	-0.058	0.048	-0.321	**0.235***	**0.478***	-0.632	0.371
Cleansing milk	0.103	-0.097	-0.157	0.754	-0.198	0.328	0.100	-0.096	0.150	-0.099	-0.085	0.067
Liquid hand-wash	**0.129***	**0.192***	0.029	-0.114	-0.028	-0.045	0.120	0.002	-0.001	-0.119	0.376	0.016
Whitening toothpaste		-0.006	-0.029		-0.025	-0.083	0.003		-0.081		-0.195	-0.022
Sensitive toothpaste	-0.036	-0.015	-0.293		-0.208	-0.078	0.233	0.074	-0.190	-0.118	0.080	
Medium toothbrush	-0.018	0.018	0.149	-0.196	-0.024	0.265	0.077	-0.007	0.013	0.186	-0.328	-0.280
Floss		0.007	0.023	0.087	-0.174	0.170	-0.006	0.058	0.092	-0.133	-0.085	-0.263

Table 2 (Continued). Product preferences regarding brand loyalty.

	Day and night antiaging	Nourishing antiaging	Bath soap	Spray deodorant	Deodorant roll	Body shampoo	Body lotion/oil	Women's hygienic gel	Regular toothpaste	Whitening toothpaste	Sensitive toothpaste	Soft toothbrush	Medium toothbrush
Rinse-off hair conditioner													
Leave-in hair conditioner													
Shaving gel/foam													
Shaving powder													
Sunscreen SPF 30-50													
Eye moisturizer													
Eye firmer													
Intense face & hand moisturizer													
Medium anti-acne peeling													
Anti-acne soap													
Nourishing antiaging	**0.893****												
Skin brightening	-0.247	-0.061											
Cream soap	-0.258	-0.374	0.080										
Deodorant roll	-0.139	-0.310	0.093	**0.494****									
Deodorant stick		-0.200	-0.148	0.278	**0.418***								
Body shampoo	-0.157	-0.296	**0.120***	**0.182***	0.069								
Body lotion/oil	0.800	0.067	0.045	0.148	0.166	0.207							
Women's hygienic gel	-0.134	-0.266	**0.285****	-0.004	0.044	0.028	0.120						
Cleansing milk	**0.566****	**0.551***	0.070	-0.177	-0.005	-0.001	**0.466****	0.052					
Liquid hand-wash	0.165	0.218	0.014	-0.130	0.139	**0.195****	0.105	-0.145					
Whitening toothpaste	0.064	0.197	-0.016	-0.103	-0.094	-0.133	-0.039	-0.070	**0.344****				
Sensitive toothpaste			0.051	-0.257	-0.031	-0.032	0.042	-0.008	**0.410****	**0.521****			
Medium toothbrush		-0.343			0.104	0.074	-0.168	0.030	-0.109	-0.144	0.186	**0.972****	
Floss	0.226	-0.202	-0.080	0.042	0.012	-0.100	-0.029	-0.159	-0.013	0.037	0.149	0.124	**0.156***

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

Given the rather exponential growth of the personal care product market in recent years, in particular in the Middle East, it is important to understand how socio-demographic factors affect consumers' use patterns, as a result of which appropriate market strategies could be established to further expand the personal care market and enhance consumer engagement. The findings of this study indicate that gender, economic status, and other socio-demographic factors significantly impact consumers' intention to purchase or continue to use personal care products. The findings nicely tie in with previous empirical data [17] on this issue.

To the best of the authors' knowledge, this is the first study done in a wide range of personal care products in a population of such a scale. The results of this survey was matched with those of others done outside Iran. In previous studies, the use patterns of ~30 types of personal care products among Californian households [18], 22 products among the Swiss population [19], 8 leave-on personal care product categories among the German population in Switzerland [20] had been studied; the retail market for beauty and personal care products in the six countries of the Persian Gulf Cooperation Council [1], the use patterns of 23 personal care products among Saudi Arabian females [21], and the use patterns of 32 personal care products among a Dutch population (Biesterbos *et al.*, 2013) had also been studied previously.

Our findings suggest that age and economic status have a greater impact than other factors on the use prevalence of most personal care products. Younger adults were more likely to use many of the products used by all age groups, and they were also more likely to use them more frequently than the others; however, some products might not be popular with younger adults (e.g., bath soap and anti-crack cream). Women were more leading users of many personal care products except for some products such as shaving gel/foam, traditional soap, and insect repellent [22]. Such results can be partially explained by the fact that both younger adults and women tend to use a wide range of products and spend more time on their personal care [23], and when considering whether or not to use a professional product such as anti-aging cream, income and economic status can influence their use prevalence. For example, participants with higher economic status were quite conscious about their whiteness and health of their teeth as they seemed to use more of whitening and sensitive toothpaste and anti-cavity mouthwash [24]. This might suggest that retail businesses and marketers of these products should offer affordable professional products suitable for all age groups.

As also shown in previous studies, educational level and occupational status both contribute to the use of some personal care products, for example, since homemakers are more likely to be exposed to household chemical products, they use more of face and hand moisturizer. Another example is the sunscreen; individuals'awareness of the association between sun exposure and skin cancer can partially explain its more popularity with the educated population. On the other hand, as the retired population is less likely to be exposed to the sun as much as others, solar care products were less popular with them. Also, based on beauty concerns and behavioral habits, students were more likely to use anti-acne products and retirees tend to use traditional soap more. The results were in good agreement with those of the Biesterbos *et al.*, 2013, which confirmed that use patterns varied as different factors such as age and educational level were taken into account (Biesterbos *et al.*, 2013; Ghazali *et al.*, 2017).

The findings of this study stress that differences in purchasing locations and preference for the product source, be it domestic or foreign, can be attributed to aspects such as educational level, economic status, and religiosity level. Since college degree attainment is usually commensurate with economic status, participants with a college degree seem to be indifferent to the source of many personal care product categories, and in some professional products (e.g. solar care, eye care, and anti-aging products) they prefer foreign products [26]. Also, a higher level of religiosity was found to be associated with using domestically manufactured products, which can be traced to the consumers being influenced by a patriotic sentiment promoted by the country's mass media and religious authorities on the use of domestic products. In this study, purchasing location preferences were also compared between men and women; differences in purchasing locations indicate that women tend to buy hair styling, shaving, and deodorant products more from beauty shops, while men tend to buy many of their personal care products from pharmacies. Both men and women tend to buy hygienic products (e.g., soap, shampoo, and cleansers) from hypermarkets [27,28].

The combined use of personal care product categories of the same brand was evaluated using Pearson's coefficient to demonstrate cross-sectional perceptions of retail brand loyalty. The combined use of two personal care products was found in a high percentage of the respondents, such as leave-in hair conditioner and daily shampoo ($r = 0.178$). Bennett *et al.*, 2010 marked a

similar usage pattern as a moderate correlation between the amounts of hair conditioner used and shampoo (r = 0.43). This brand loyalty can be put down to factors such as gender and the consumers' relatives' behavior [18]. Thus, for influencing attitudes towards the personal care market as engaging in sustainable consumption when making decisions, recommendations from friends and family members could be influential. For instance, environmental sensibility can be cultivated among individuals to active consumers regarding personal care products and create a link to their intrinsic desires, this sensibility and sensitivity towards environmental sustainability is often created by friends and family members; thus, environmentally friendly products can strongly resonate with this group of individuals [29,30].

The variability in the methods of data collection based on available databases [4, 31], telephone interviews [18], diary documentation by volunteers [8, 32, 33], and different populations studied in the literature may explain the differences regarding in use prevalence, purchasing locations, product source preferences, and cross-sectional perceptions of retail brand loyalty.

However, there are some limitations for this study to point out: first, the available literature on socio-demographic factors such as gender, age, economic status, occupational status, level of religiosity, education level was not rich enough to adequately address and explain the effects of these factors on the use pattern of personal care products. Second, the size of consumption for solid products were not explored. Third, this study was conducted before theCovid-19 pandemiand the authors believe that this crisis has an impact on consumer behavior, and as a result, an updated study can be conducted and the results of the two can be compare.

4. Conclusion

As The first and arguably the most comprehensive study in the Middle East, this survey established a database for 125 personal care products, including hair care, skincare, body care, oral care, and hygienic products. For each line of personal care products, various products were included to obtain specific data for each item. For example, shampoo was broken down into daily, anti-hair loss, oily/dry scalp, colored hair, and anti-dandruff shampoo, and deodorants were classified into spray, roll-on, and stick products. The 42 reported products were used by a larger number of the study subjects. All the products were analyzed using various variables such as economic status, occupational status, purchase location, level of religiosity, and brand preferences. Unlike previous studies on use patterns, this work focused on individual data across all adult age groups in the Iranian population and was not limited to certain product users. As a result, the use prevalence of the products in this population can represent the use prevalence of roughly 75% of personal care product categories available on the market.

The response rate in paper questionnaires was generally higher compared to online questionnaires as confidentiality and safety issues may play less of a role; however, they have their own drawbacks such as the impossibility of immediate checks for implausible or incomplete answers [34].

It was also concluded that age, gender, and other socio-demographic characteristics such as education level, economic status, and level of religiosity might affect the use prevalence of personal care products. Occupational status influences of the choice of some product categories, and economic status also contributes to the use of personal care product categories. One goal of examining the product sources was to estimate the popularity and affordability of Iranian and foreign products in the personal care product market. Notwithstanding the increased trend in the capital city, Tehran, online stores and social media sales on platforms like Instagram and Telegram do not play an important role in the sales of personal care products among the Iranian population. Education level and marital status did not have much of an impact on purchasing location preferences. The use of more than one personal care product of the same brand can point to users' cross-sectional perceptions of brand loyalty. Also, patterns of brand loyalty can help marketers make out features that can help develop a given product. Likewise, the correlation between the use of personal care products in the same class (i.e., hygienic products/makeup/skincare/hair products) suggests that cross-sectional perceptions of brand loyalty to professional skincare products is more pronounced thanks to their higher quality and the trust the consumers have invested through years of consumption.

In summary, this study updates the current knowledge and sheds light on the use patterns of several personal care products among Iranians. The results can have far-reaching practical implications for policymakers and personal care industry activists in terms of their planning for the future.

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Conflict of interest

The authors report no conflicts of interest related to this study.

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