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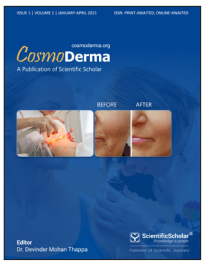

*Original Article*

# Over-the-counter cosmeceuticals: Exploring usage patterns and attitudes among Indians

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Received: 25 May 2024
Accepted: 14 June 2024
Published: 15 July 2024

**DOI**
10.25259/CSDM_76_2024

**Quick Response Code:**

## ABSTRACT

**Objectives:** The study's objectives were to find the prevalence of over-the-counter (OTC) usage of skin, nail, and hair care products and to understand the knowledge, attitudes, and practices (KAPs) of the Indian population presenting to a non-dermatology outpatient department (OPD) for various indications concerning this usage.

**Materials and Methods:** This was a cross-sectional questionnaire-based study, conducted over a year, in which 668 consenting Indians aged 18–60 years, representing various socioeconomic backgrounds were surveyed through Google Forms regarding the OTC cosmeceutical usage in a non-dermatology OPD.

**Results:** This KAP study was conducted on 668 participants, of whom the majority were middle-aged males (481 [72.01%]), with a diverse socioeconomic range, with the upper-middle class making up the largest segment (264 [39.52%]). Allopathy was the primary treatment choice for 347 (51.95%) of participants, with 566 (84.73%) preferring professional healthcare over self-medication. Social media was a significant source of skincare information, with Google Ads (279 [41.8%]) and Instagram (84 [12.6%]) being popular platforms. While doctors' advice influenced 270 (40.4%) of participants in their skincare choices, word-of-mouth played a role, with 251 (37.57%) agreeing it was helpful. OTC usage was found to vary by socioeconomic class and treatment type. Oral OTC products were preferred for skin health, especially in the upper class, while fairness creams were more common among the lower class.

**Conclusion:** Despite the growing reliance on social media for skincare information, traditional sources such as word-of-mouth and TV still hold sway, indicating a mix of modern and conventional influences. The frequency and type of OTC product usage varied across socioeconomic classes, with oral products like vitamin supplements leading in the upper class and fairness creams leading in the lower class, reflecting the societal pressure for a fair complexion in this subset.

**Keywords:** Over-the-counter, Cosmeceutical, Socioeconomic status, Skincare, Knowledge, attitude, and practice

## INTRODUCTION

The escalating usage of over-the-counter (OTC) cosmeceuticals is a cause for concern globally, especially in developing nations like India.[1] Cosmeceuticals, unlike regular cosmetics, have bioactive ingredients that purportedly provide medicinal benefits.[2] However, their rampant use without proper medical guidance poses significant health risks. In addition, the unrestricted use of OTC drugs, driven by lax regulations and consumer attitudes, raises questions about the efficacy and safety of these products.[1] India, with its diverse socioeconomic strata, provides a unique backdrop to study the prevalence of OTC cosmeceuticals and the knowledge, attitudes, and practices associated with their usage. In India, the phrase "OTC" has no legal recognition.

Here, this term is used for the way drugs are used (such as self-medication without prescription or being allowed to be sold by pharmacists without the prescription of a Registered Medical Practitioner) rather than being a recognized official category of medicines, unlike in other countries.[3]

We conducted a questionnaire-based study to bridge this knowledge gap, focusing specifically on cosmeceuticals. The various variables recorded in the study included gender, age, educational qualifications, employment status, socioeconomic scale, preferred medical services, buying frequency, opinions on skincare information sources, and likelihood of recommendation to others. In addition, leading questions about the application of certain common OTC skin, hair, and nail care products were included to uncover the usage of certain OTC products with abuse potential.

## MATERIALS AND METHODS

This was a cross-sectional questionnaire-based study, conducted over a year from January 2023 to January 2024. Sample size calculation was done using Andrew Fisher's formula, assuming a 99% confidence level (Z score = 2.58), a margin of error of 5% (E = 0.05), and a standard deviation of 0.5. In the absence of prior data on the specific proportion of the population with the attribute of interest, we used a conservative estimate of $P$ (σ) = 0.5. This is a common practice as it maximizes the sample size, ensuring the study is adequately powered even if the actual proportion is different. On substituting these values in the formula ($n = [Z \cdot \sigma / E]^2$), $n$ (sample size) comes out to be 665.64. Thus, a total of 668 consenting Indians, presenting to a general outpatient department of a peripheral hospital predominantly catering to the male population, aged between 18 and 60 years, were surveyed through a questionnaire on Google Forms. The Google forms were available in English and filled by a medical officer in the presence of the patient after obtaining informed consent from each patient. Most of the participants were conversant in English, and suitable translation was made available wherever required. The questions were about their basic demographics, their socioeconomic status, their medication-seeking preferences, and their knowledge and attitudes about OTC cosmeceuticals concerning the treatment of skin, hair, and nails. The responses were reflected on a Google spreadsheet, and the Statistical Package for the Social Sciences version 27.0 was used for data analysis.

For data interpretation, we utilized both numerical values and percentages. The Chi-square test was employed to establish statistical associations between qualitative variables among the socioeconomic groups, with a significance level set at $P < 0.05$. This approach ensured rigorous analysis of the data and robust comparison of categorical variables.

## RESULTS

This study, which surveyed 668 participants, reveals a broad range of demographics and behaviors concerning OTC cosmeceuticals. The majority of respondents were middle-aged males (481 [72.01%]), with the upper-middle class being the most represented socioeconomic group (264 [39.52%]) [Table 1]. Allopathy emerged as the primary choice for treatment among 347 participants (51.95%), with a significant preference for professional healthcare over self-medication (566 [84.73%]). The use of OTC products varied significantly across socioeconomic classes based on the prevalence of skin, hair, and nail problems in these classes [Figure 1]. Traditional sources such as TV (113 [16.9%]) followed by word-of-mouth (251 [37.57%]) significantly influenced participants' skincare choices. Notably, doctors' advice was a significant factor for 270 (40.4%) participants, though many still relied on recommendations from friends, relatives, and pharmacists [Figure 2]. Chi-square tests revealed significant associations between socioeconomic groups and the use of social media ($P = 0.009$) as well as the influence of doctors' advice ($P = 0.022$). Social media played a crucial role in disseminating skincare information. Google Ads were the most popular source (279 [41.8%]) followed by Instagram (84 [12.6%]) [Figure 3].

A majority of the study participants preferred consulting health-care professionals (566 [84.73%]) rather than self-medicating. The frequency of purchasing OTC cosmetic products varied: 209 (31.29%) bought them once a year, 130 (19.46%) twice a year, 159 (23.80%) 3–6 times a year, 58 (8.68%) 7 or more times a year, 96 (14.37%) monthly,

**Table 1:** Baseline characteristics and socioeconomic strata of study population.

| | Number | Percentage |
|---|---|---|
| Gender | | |
| Female | 187 | 27.99 |
| Male | 481 | 72.01 |
| Total | 668 | 100 |
| Age (in years) | | |
| 18–30 | 389 | 58.23 |
| 31–40 | 216 | 32.34 |
| 41–50 | 42 | 6.29 |
| 51–60 | 21 | 3.14 |
| Total | 668 | 100 |
| SES | | |
| Upper | 62 | 9.28 |
| Upper middle | 264 | 39.52 |
| Lower middle | 198 | 29.64 |
| Upper lower | 136 | 20.36 |
| Lower | 8 | 1.2 |
| Total | 668 | 100 |

SES: Socioeconomic status

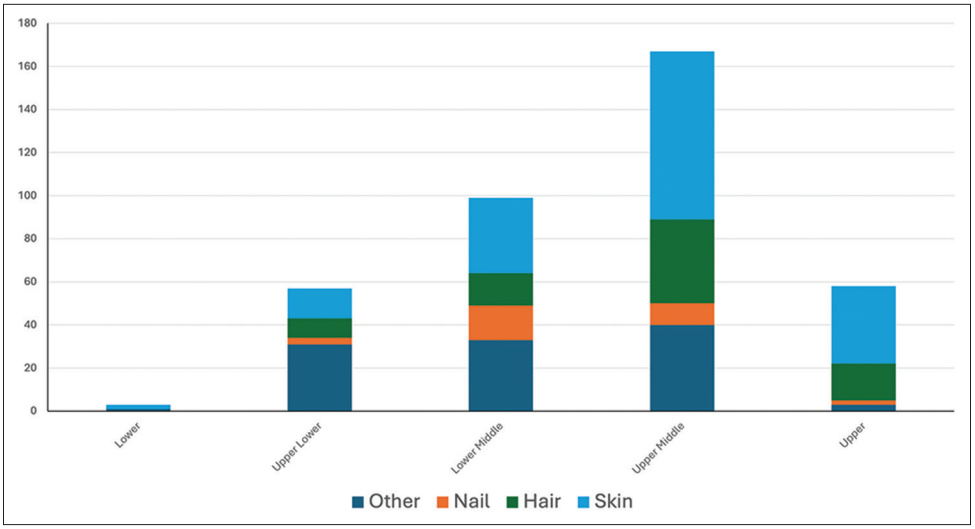


**Figure 1:** Prevalence of skin, hair, and nail problems as per the socioeconomic strata.

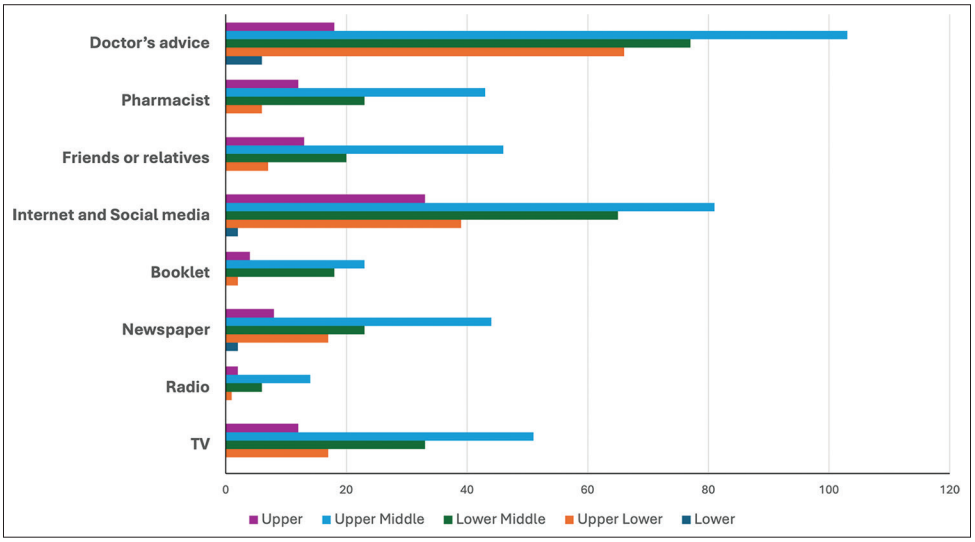


**Figure 2:** Opinion on learning about skincare from various sources.

12 (1.80%) weekly, and 4 (0.60%) daily. Participants displayed mixed attitudes toward skincare information sources. While 215 (32.19%) agreed that advertisements were helpful, 298 (44.61%) remained neutral, and 94 (14.07%) disagreed. Regarding the continuation of using the same source of information, 218 (32.63%) said that they probably would continue, 235 (35.18%) were neutral, and 90 (13.47%) probably would not continue. Most participants indicated that they would probably recommend a beneficial cosmeceutical to others (230 [34.43%]), with a neutral response from 206 (30.84%) [Figure 4].

For skincare, the most common OTC products used were oral supplements for general skin health (159 [23.8%]). This preference was highest in the upper class (32 [51.6%]) and upper-middle class (73 [27.7%]), with significant differences noted from other classes ($P = 0.001$). Higher socioeconomic groups preferred sun protection creams (16 [25.8%] in the upper class), whereas lower groups leaned toward acne treatments (26 [13.1%] in the lower-middle class) and fairness creams (4 [50%] in the lower class) [Table 2]. Usage of OTC products for hair care was reported by 328 (49.10%) participants, with oral agents for hair strengthening being the most common (121 [36.9%]), particularly among the upper-middle class (52 [42%]). Significant associations were found between socioeconomic groups and hair product usage ($P = 0.001$) [Table 3]. For nail health, the most used OTC products were for general nail health (99 [33%]), predominantly by the upper-middle class, with a significant correlation ($P = 0.02$). For oral health, mouth rinsing (58 [8.7%]) and teeth whitening products (39 [5.8%]) were

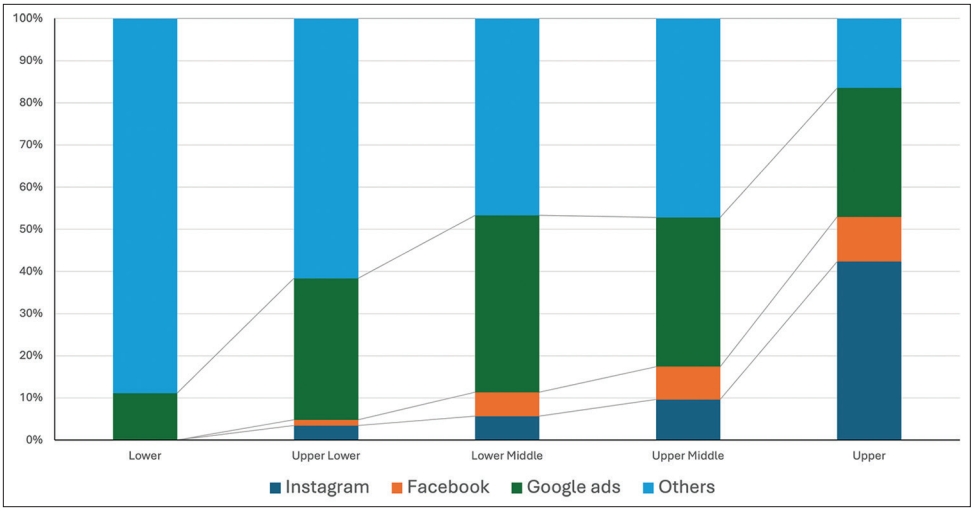


**Figure 3:** Opinion on learning about skincare from various Internet sources as per the socioeconomic strata.

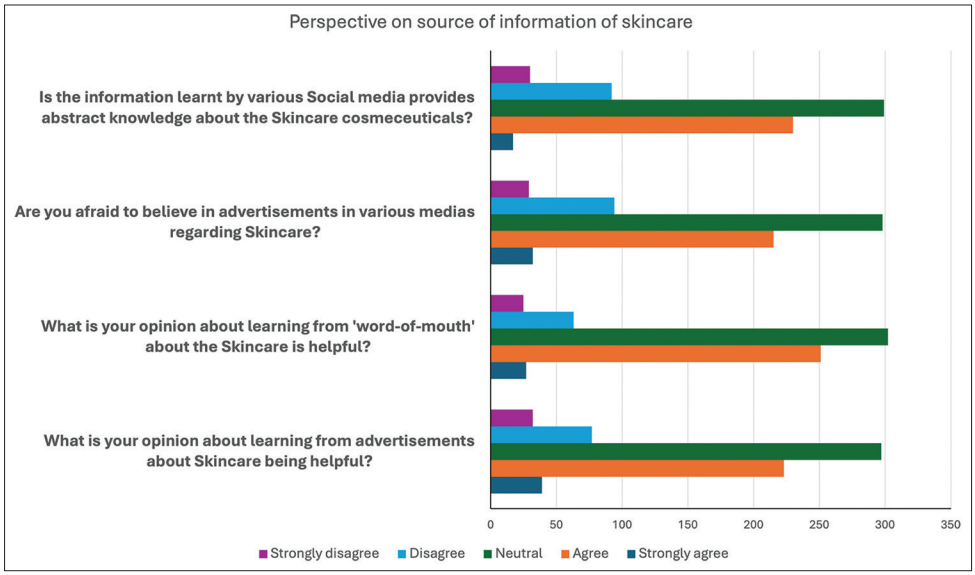


**Figure 4:** Perspective on source of skincare.

most common, with significant socioeconomic variation ($P = 0.002$) [Table 4].

## DISCUSSION

Our research study provides a detailed snapshot of diverse demographics and behaviors concerning OTC cosmeceuticals. Previously, very few studies have touched on the usage of OTC drugs in skincare, and here too, most have only dwelled on the management of acne.[4-6] Out of the research group, 481 (72.01%) patients were male, and 187 (27.99%) were female. The male preponderance can be explained by the fact that the study was conducted in an Medical Inspection (MI) room, which caters to a predominantly male population. Other studies usually showed a reverse trend with a preponderance of females using OTC products.[6] Age-wise, 389 (58.23%) fall within the 18–30 bracket, indicating a strong interest among younger individuals, while varying percentages in older age groups hint at potential skincare preference differences. Educationally, 325 (48.65%) were graduates and 140 (20.96%) held high school certificates suggesting a mix of educational backgrounds. In socioeconomic terms, 264 (39.52%) fall into the upper-middle class, shedding light on economic accessibility to OTC cosmeceuticals. We could not find a previous study that has highlighted the socioeconomic information to stratify the OTC usage of skincare products,

**Table 2:** OTC usage for different skin conditions as per the socioeconomic strata.

| | Socioeconomic status and skincare | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Lower | | Upper lower | | Lower middle | | Upper middle | | Upper | | Chi-square test | *P*-value |
| | Number | Percentage | Number | Percentage | Number | Percentage | Number | Percentage | Number | Percentage | | |
| Oral OTC for general skin health | | | | | | | | | | | | |
| No | 5 | 62.50 | 112 | 82.40 | 171 | 86.40 | 191 | 72.30 | 30 | 48.40 | 43.547 | 0.001 |
| Yes | 3 | 37.50 | 24 | 17.60 | 27 | 13.60 | 73 | 27.70 | 32 | 51.60 | | |
| Oral OTC for treatment of acne | | | | | | | | | | | | |
| No | 8 | 100.00 | 125 | 91.90 | 183 | 92.40 | 240 | 90.90 | 56 | 90.30 | 1.223 | 0.874 |
| Yes | 0 | 0.00 | 11 | 8.10 | 15 | 7.60 | 24 | 9.10 | 6 | 9.70 | | |
| Topical OTC for treatment of acne | | | | | | | | | | | | |
| No | 7 | 87.50 | 129 | 94.90 | 172 | 86.90 | 233 | 88.30 | 57 | 91.90 | 6.476 | 0.166 |
| Yes | 1 | 12.50 | 7 | 5.10 | 26 | 13.10 | 31 | 11.70 | 5 | 8.10 | | |
| Topical OTC for treatment of acne marks | | | | | | | | | | | | |
| No | 7 | 87.50 | 132 | 97.10 | 184 | 92.90 | 242 | 91.70 | 58 | 93.50 | 4.656 | 0.324 |
| Yes | 1 | 12.50 | 4 | 2.90 | 14 | 7.10 | 22 | 8.30 | 4 | 6.50 | | |
| Topical skin cleansing OTC | | | | | | | | | | | | |
| No | 8 | 100.00 | 134 | 98.50 | 187 | 94.40 | 239 | 90.50 | 51 | 82.30 | 20.085 | 0.001 |
| Yes | 0 | 0.00 | 2 | 1.50 | 11 | 5.60 | 25 | 9.50 | 11 | 17.70 | | |
| Topical OTC for treatment of dry skin | | | | | | | | | | | | |
| No | 7 | 87.50 | 133 | 97.80 | 185 | 93.40 | 248 | 93.90 | 55 | 88.70 | 7.275 | 0.122 |
| Yes | 1 | 12.50 | 3 | 2.20 | 13 | 6.60 | 16 | 6.10 | 7 | 11.30 | | |
| OTC for dry heels | | | | | | | | | | | | |
| No | 5 | 62.50 | 127 | 93.40 | 192 | 97.00 | 249 | 94.30 | 56 | 90.30 | 19.252 | 0.0001 |
| Yes | 3 | 37.50 | 9 | 6.60 | 6 | 3.00 | 15 | 5.70 | 6 | 9.70 | | |
| Topical OTC for treatment of vitiligo | | | | | | | | | | | | |
| No | 8 | 100.00 | 134 | 98.50 | 192 | 97.00 | 261 | 98.90 | 61 | 98.40 | 2.601 | 0.627 |
| Yes | 0 | 0.00 | 2 | 1.50 | 6 | 3.00 | 3 | 1.10 | 1 | 1.60 | | |
| Topical OTC for skin tanning | | | | | | | | | | | | |
| No | 8 | 100.00 | 128 | 94.10 | 192 | 97.00 | 258 | 97.70 | 62 | 100.00 | 6.541 | 0.162 |
| Yes | 0 | 0.00 | 8 | 5.90 | 6 | 3.00 | 6 | 2.30 | 0 | 0.00 | | |
| Topical OTC for skin whitening | | | | | | | | | | | | |
| No | 4 | 50.00 | 134 | 98.50 | 194 | 98.00 | 244 | 92.40 | 52 | 83.90 | 50.503 | 0.001 |
| Yes | 4 | 50.00 | 2 | 1.50 | 4 | 2.00 | 20 | 7.60 | 10 | 16.10 | | |
| Topical OTC for treatment of eczema | | | | | | | | | | | | |
| No | 8 | 100.00 | 136 | 100.00 | 195 | 98.50 | 258 | 97.70 | 61 | 98.40 | 3.272 | 0.513 |
| Yes | 0 | 0.00 | 0 | 0.00 | 3 | 1.50 | 6 | 2.30 | 1 | 1.60 | | |
| Topical OTC for treatment of stretch marks | | | | | | | | | | | | |
| No | 6 | 75.00 | 136 | 100.00 | 192 | 97.00 | 258 | 97.70 | 60 | 96.80 | 21.364 | 0.001 |
| Yes | 2 | 25.00 | 0 | 0.00 | 6 | 3.00 | 6 | 2.30 | 2 | 3.20 | | |
| Topical OTC for treatment of bad skin odor | | | | | | | | | | | | |
| No | 6 | 75.00 | 132 | 97.10 | 193 | 97.50 | 243 | 92.00 | 51 | 82.30 | 26.533 | 0.001 |
| Yes | 2 | 25.00 | 4 | 2.90 | 5 | 2.50 | 21 | 8.00 | 11 | 17.70 | | |
| Topical OTC for Sun protection | | | | | | | | | | | | |
| No | 6 | 75.00 | 130 | 95.60 | 186 | 93.90 | 232 | 87.90 | 46 | 74.20 | 28.191 | 0.001 |
| Yes | 2 | 25.00 | 6 | 4.40 | 12 | 6.10 | 32 | 12.10 | 16 | 25.80 | | |
| Topical cream for fungal infection | | | | | | | | | | | | |
| No | 6 | 75.00 | 136 | 100.00 | 185 | 93.40 | 243 | 92.00 | 57 | 91.90 | 15.809 | 0.003 |
| Yes | 2 | 25.00 | 0 | 0.00 | 13 | 6.60 | 21 | 8.00 | 5 | 8.10 | | |

OTC: Over-the-counter

**Table 3:** OTC usage of hair care products as per the socioeconomic strata.

| | Socioeconomic status and hair care | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Lower | | Upper lower | | Lower middle | | Upper middle | | Upper | | Chi- square test | *P*-value |
| | Count | Column *n* % | Count | Column *n* % | Count | Column *n* % | Count | Column *n* % | Count | Column *n* % | | |
| Oral OTC for hair strengthening | | | | | | | | | | | | |
| No | 8 | 100.00 | 115 | 84.60 | 183 | 92.40 | 212 | 80.30 | 29 | 46.80 | 69.227 | 0.001 |
| Yes | 0 | 0.00 | 21 | 15.40 | 15 | 7.60 | 52 | 19.70 | 33 | 53.20 | | |
| Topical OTC for treatment of alopecia | | | | | | | | | | | | |
| No | 8 | 100.00 | 134 | 98.50 | 191 | 96.50 | 249 | 94.30 | 58 | 93.50 | 5.318 | 0.256 |
| Yes | 0 | 0.00 | 2 | 1.50 | 7 | 3.50 | 15 | 5.70 | 4 | 6.50 | | |
| Topical OTC for treatment of thin hair | | | | | | | | | | | | |
| No | 7 | 87.50 | 132 | 97.10 | 183 | 92.40 | 244 | 92.40 | 57 | 91.90 | 4.233 | 0.375 |
| Yes | 1 | 12.50 | 4 | 2.90 | 15 | 7.60 | 20 | 7.60 | 5 | 8.10 | | |
| Topical OTC for strengthening hair | | | | | | | | | | | | |
| No | 7 | 87.50 | 133 | 97.80 | 180 | 90.90 | 247 | 93.60 | 56 | 90.30 | 7.504 | 0.112 |
| Yes | 1 | 12.50 | 3 | 2.20 | 18 | 9.10 | 17 | 6.40 | 6 | 9.70 | | |
| Topical OTC for straightening hair | | | | | | | | | | | | |
| No | 8 | 100.00 | 132 | 97.10 | 191 | 96.50 | 246 | 93.20 | 62 | 100.00 | 8.029 | 0.091 |
| Yes | 0 | 0.00 | 4 | 2.90 | 7 | 3.50 | 18 | 6.80 | 0 | 0.00 | | |
| Topical OTC for curling hair | | | | | | | | | | | | |
| No | 8 | 100.00 | 134 | 98.50 | 187 | 94.40 | 251 | 95.10 | 60 | 96.80 | 4.271 | 0.371 |
| Yes | 0 | 0.00 | 2 | 1.50 | 11 | 5.60 | 13 | 4.90 | 2 | 3.20 | | |
| Topical OTC for treatment of hair dandruff | | | | | | | | | | | | |
| No | 7 | 87.50 | 127 | 93.40 | 186 | 93.90 | 246 | 93.20 | 57 | 91.90 | 0.747 | 0.945 |
| Yes | 1 | 12.50 | 9 | 6.60 | 12 | 6.10 | 18 | 6.80 | 5 | 8.10 | | |
| Topical OTC for treatment of white hair | | | | | | | | | | | | |
| No | 7 | 87.50 | 134 | 98.50 | 189 | 95.50 | 259 | 98.10 | 60 | 96.80 | 6.597 | 0.159 |
| Yes | 1 | 12.50 | 2 | 1.50 | 9 | 4.50 | 5 | 1.90 | 2 | 3.20 | | |
| Topical OTC for treatment of hair lice | | | | | | | | | | | | |
| No | 7 | 87.50 | 135 | 99.30 | 194 | 98.00 | 255 | 96.60 | 61 | 98.40 | 6.539 | 0.162 |
| Yes | 1 | 12.50 | 1 | 0.70 | 4 | 2.00 | 9 | 3.40 | 1 | 1.60 | | |
| Topical OTC for eye lashes | | | | | | | | | | | | |
| No | 8 | 100.00 | 132 | 97.10 | 193 | 97.50 | 262 | 99.20 | 61 | 98.40 | 3.38 | 0.496 |
| Yes | 0 | 0.00 | 4 | 2.90 | 5 | 2.50 | 2 | 0.80 | 1 | 1.60 | | |

OTC: Over-the-counter

making our study the first of its kind to elaborate on these factors in the usage of OTC products.

Concerning medical services sought and preferred, allopathy leads with maximum popularity at 347 (51.93%), with 182 (27.25%) practicing Ayurvedic and 125 (18.7%) practicing homeopathy. This was in sync with a study by Jawla *et al*. on 500 individuals in which a large portion of the population up to 50% preferred allopathy, 28% preferred Ayurvedic, and 20% preferred homeopathic systems of medicines, which, further, inclined toward allopathy in cases of emergency.[7] In terms of consultation, 566 (84.73%) prefer professional advice over self-medication, emphasizing the role of healthcare practitioners. Overall, the mean prevalence of self-medication practices in India has been observed to be 53.57%, and familiarity with the medication appears to be a major reason to practice self-medication.[8] Buying patterns in our study revealed diverse consumer behavior, with 209 (31.24%) making yearly purchases and 102 (15.27%) opting for internet self-medication.

Analyzing attitudes toward skincare information sources, 297 (44.50%) adopt a neutral stance on advertisements, while 251 (37.61%) agree with "word-of-mouth." Interestingly, the internet emerged as a significant source of information in some other studies as well. In one study, 47% of the dermatology outpatients used the Internet to get health-related information,[9] suggesting the need for reliable online resources curated by health-care professionals. In a study conducted in Saudi Arabia on 1174 females, 51% of the study females became familiar with skincare products from social media platforms.[10]

As per individual diseases, we found that most individuals used maximum OTC medications for general skincare in

**Table 4:** OTC usage of nail and oral care products as per the socioeconomic strata.

| | Socioeconomic status and nail and oral healthcare | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Lower | | Upper Lower | | Lower Middle | | Upper Middle | | Upper | | Chi-square test | *P*-value |
| | Count | Column *n* % | Count | Column *n* % | Count | Column *n* % | Count | Column *n* % | Count | Column *n* % | | |
| Topical OTC for general nail health | | | | | | | | | | | | |
| No | 7 | 87.50 | 120 | 88.20 | 173 | 87.40 | 225 | 85.20 | 44 | 71.00 | 11.715 | 0.02 |
| Yes | 1 | 12.50 | 16 | 11.80 | 25 | 12.60 | 39 | 14.80 | 18 | 29.00 | | |
| Topical OTC for fungal nail infections | | | | | | | | | | | | |
| No | 7 | 87.50 | 130 | 95.60 | 187 | 94.40 | 253 | 95.80 | 54 | 87.10 | 8.448 | 0.076 |
| Yes | 1 | 12.50 | 6 | 4.40 | 11 | 5.60 | 11 | 4.20 | 8 | 12.90 | | |
| Topical OTC for broken nails | | | | | | | | | | | | |
| No | 8 | 100.00 | 134 | 98.50 | 182 | 91.90 | 252 | 95.50 | 61 | 98.40 | 10.063 | 0.039 |
| Yes | 0 | 0.00 | 2 | 1.50 | 16 | 8.10 | 12 | 4.50 | 1 | 1.60 | | |
| OTC for cleansing the mouth | | | | | | | | | | | | |
| No | 5 | 62.50 | 127 | 93.40 | 180 | 90.90 | 239 | 90.50 | 59 | 95.20 | 10.514 | 0.033 |
| Yes | 3 | 37.50 | 9 | 6.60 | 18 | 9.10 | 25 | 9.50 | 3 | 4.80 | | |
| OTC for teeth whitening | | | | | | | | | | | | |
| No | 5 | 62.50 | 128 | 94.10 | 185 | 93.40 | 250 | 94.70 | 61 | 98.40 | 16.93 | 0.002 |
| Yes | 3 | 37.50 | 8 | 5.90 | 13 | 6.60 | 14 | 5.30 | 1 | 1.60 | | |
| OTC for treatment of bad mouth odor | | | | | | | | | | | | |
| No | 7 | 87.50 | 134 | 98.50 | 191 | 96.50 | 253 | 95.80 | 60 | 96.80 | 3.995 | 0.407 |
| Yes | 1 | 12.50 | 2 | 1.50 | 7 | 3.50 | 11 | 4.20 | 2 | 3.20 | | |
| Oral OTC multivitamins | | | | | | | | | | | | |
| No | 8 | 100.00 | 134 | 98.50 | 186 | 93.90 | 244 | 92.40 | 59 | 95.20 | 7.026 | 0.135 |
| Yes | 0 | 0.00 | 2 | 1.50 | 12 | 6.10 | 20 | 7.60 | 3 | 4.80 | | |

OTC: Over-the-counter

the form of vitamin supplements. This was followed by sun protection, cleansing, fairness creams, etc. Out of these, the higher socioeconomic strata resorted to more sun protection creams and moisturizers as they possess the awareness to use these products and also can buy them. As we go down the socioeconomic strata, the usage of acne medication and fairness creams increases due to lack of awareness and the societal pressure and norm of connecting beauty with a fair complexion.

Very few individuals were found to use OTC products for the care of hair, nails, and oral health, and here too maximum used products for strengthening hair. We could not find any previous study, which has analyzed OTC usage for the improvement of these parameters.

The findings of this study align with global concerns regarding irrational OTC drug usage which is even more prevalent in India due to less stringent rules for OTC purchases. One such study Panda *et al.*[11] provided valuable insights into prevalent self-medication practices where fever, pain, and common ailments drove OTC medication choices, with non-prescription antibiotics gaining prominence, raising concerns about antibiotic resistance. Limited access to formal health-care services and financial constraints led individuals, particularly those with chronic illnesses, to rely on OTC solutions. Similar factors apply to OTC usage of skincare products as well more so due to the non-availability of dermatologists in remote areas and less seriousness of the conditions which prompt the clientele to resort to OTC treatment.

This study's scope was limited to a specific demographic area, predominantly catering to a male population, necessitating broader research to encompass diverse populations for more generalizable findings. In addition, future research would benefit from longitudinal studies that track consumer behavior changes over time to provide deeper and more comprehensive insights into the trends and patterns observed.

## CONCLUSION

This study offers valuable insights into consumer behavior concerning cosmeceuticals. Despite the growing reliance on social media for skincare information, traditional sources such as word-of-mouth and TV still hold sway, indicating a mix of modern and conventional influences. The frequency and type of OTC product usage varied across socioeconomic classes, with oral products such as vitamin supplements and sunscreens leading in the upper class and fairness creams leading in the lower class, reflecting the societal pressure

for a fair complexion in this subset. The study highlights the target population that needs to be addressed to prevent the abuse of OTC products, which seem harmless but carry long-term abuse and damage potential such as fairness creams and topical steroids. The study, however, did not cover the side effects noticed by the study subjects due to these OTC drugs and this could be a potential area for future research.

The study sheds light on the diverse demographics and behaviors associated with OTC cosmeceutical use in India, emphasizing the need for enhanced regulatory measures and consumer education to ensure the safe and informed use of these products. However, a larger study with a varied demographic profile needs to be conducted to obtain more robust results, which can direct policymaking with respect to the use of cosmeceuticals.

### Ethical approval

The Institutional Review Board has waived the ethical approval for this study.

### Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent.

### Financial support and sponsorship

Nil.

### Conflicts of interest

There are no conflicts of interest.

### Use of artificial intelligence (AI)-assisted technology for manuscript preparation

The authors confirm that there was no use of artificial intelligence (AI)-assisted technology for assisting in the writing or editing of the manuscript and no images were manipulated using AI.

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**How to cite this article:** Bhatnagar A, Oberoi B, Thayumanavan T, Ayub A. Over-the-counter cosmeceuticals: Exploring usage patterns and attitudes among Indians. CosmoDerma. 2024;4:76. doi: 10.25259/CSDM_76_2024