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Original article

India's Skincare Prescription: National Insights From The Moist Study On Usage Of Moisturizers.

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Abstract

Background: Moisturizers play a crucial role in managing various dermatological conditions by hydrating the skin, repairing the skin barrier, and reducing symptoms. This study aimed to analyze moisturizer prescription patterns in Indian dermatology outpatient settings, focusing on prevalent conditions and treatment modalities.

Methods: This retrospective, multicenter, cross-sectional pan India study analyzed data from 12,064 patients attending dermatology outpatient departments across the country. Data extraction included patient demographics, dermatological conditions, and moisturizer prescription details. Statistical analyses were conducted using SAS 9.4 and SPSS (version 27).

Results: The most frequently encountered dermatological conditions were Atopic Dermatitis (44.48%) presenting as dryness and associated symptoms. Emollient-based moisturizers were the most prescribed (36.3%), followed by ceramide-based moisturizers (22.4%). Lotion (41.4%) and cream (39.4%) formulations were preferred. Moisturizers were primarily prescribed for twice-daily use (79.2%). Emollients were favored for mild conditions, while occlusive and ceramide-based moisturizers were more common for moderate to severe cases. A large majority of patients (89.7%) showed improvement with moisturizer use.

Conclusion: This study highlights the prevalence of Atopic Dermatitis with clinical presentation with dryness in Indian dermatology outpatients and the importance of moisturizers, particularly emollient and ceramide-based formulations, in their management. The findings support evidence-based prescribing practices tailored to condition severity, with high efficacy and safety of prescribed moisturizers.

Keywords: Moisturizers, Dermatological Conditions, Atopic Dermatitis, Dryness, Emollients, Ceramide-based, India, Prescribing Patterns.

INTRODUCTION

The perception of healthy skin is vital for self-esteem and enhanced quality of life. Moisturizers are frequently employed to reduce fine lines, and to smoothen as well as hydrate the skin. Consistent moisturizing of skin also strengthens the skin's natural barrier, safeguarding it from internal and external irritants. Most skin diseases involve compromised barrier function, and so high-quality moisturizers serve as valuable adjuncts in both treatment and prevention. Additionally, moisturizers help to relieve bothersome symptoms such as itching and stinging.[1]

When the skin barrier is damaged, reducing water loss is essential for restoring its integrity. The primary function of a moisturizer is to minimize moisture loss. Moisturizers hydrate dry, rough, and flaky skin, along with enhancing skin flexibility by preventing moisture evaporation and promote uniform exfoliation of dead skin cells, resulting in a smoother skin surface. [2-5]

Following application to damaged skin, the skin barrier is restored through a four-step process- the oily components of moisturizer form a protective film, initiating barrier repair; change in skin's moisture distribution coefficient; moisture diffuses from the dermis to the epidermis and finally, there is water distribution to the epidermis controlled by the synthesis of skin lipids and intercellular lipid secretion.[6-12]

Moisturizers ideally have properties that can carry out the 4 basic needs of consumers: Moisturizers improve skin smoothness and softness by replenishing lipids, reducing friction, and enhancing texture. They maintain hydration by minimizing trans-epidermal water loss using occlusive agents like petroleum and dimethicone. Skin appearance is enhanced through light-reflecting pigments and iron oxides that boost radiance and combat aging signs. Additionally, their formulation allows efficient delivery of active ingredients, optimizing moisture absorption and skin benefits.[13-15]

The skin, the body's largest organ, consists of three layers: the epidermis, a protective barrier of keratinocytes; the

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dermis, a connective tissue layer providing structural support and nourishment; and the hypodermis, an insulating layer of adipose tissue. Moisturizers contribute to skin health by preventing dryness, maintain smoothness, and support barrier repair.[16,17] They work by forming a protective film, hydrating the epidermis and dermis, and regulating dead cell shedding.[18] Additionally, they offer anti-inflammatory (reduce inflammation through cytokine and prostanoid inhibition), antipruritic (cool and relieve itching via water evaporation), and antimitotic benefits (slow epidermal cell proliferation), making them essential for skin health and conditions like psoriasis.[19-23]

Mineral oil is a broad term, frequently listed as such on product labels, and is also commonly known as Paraffinum Liquidum. Petrolatum is a specific type of mineral oil, often recognized as petroleum jelly or Vaseline. Cera Microcristallina refers to microcrystalline wax, which can be derived from mineral oils. Microcrystalline wax and ozokerite are types of natural mineral wax that can serve as bases or components in mineral oil formulations. Ceresine and isoparaffin are additional names used for certain types of mineral oil, while paraffin is another common term similar to petrolatum.

Selecting the right moisturizer is essential for maintaining skin health. Dry skin benefits from rich creams with shea butter, ceramides, and glycerin to restore hydration. Oily skin requires lightweight, non-comedogenic gels with hyaluronic acid to prevent pore clogging. Combination skin needs balanced formulations with humectants like glycerin and occlusives like dimethicone. Sensitive skin should opt for fragrance-free, hypoallergenic moisturizers with soothing agents like aloe vera. Mature skin benefits from rich creams with retinol or peptides to combat dryness and signs of aging.[24]

Moisturizers are functionally categorized into Emollients, Humectants, and Occlusives. Emollients, such as fatty acids and cholesterol, improve skin texture by filling intercellular gaps and preventing water loss. Humectants, including glycerine and alpha hydroxy acids, attract moisture from the dermis and environment, though they are often combined with occlusives to prevent excessive trans-epidermal water loss (TEWL). Occlusives, such as petrolatum, form a hydrophobic barrier that minimizes TEWL by over 98%, though some variants, like lanolin and silicones, reduce TEWL by 20-30% [25-30]

This study aims to analyze medical conditions in India for which moisturizer is prescribed in outpatient settings of dermatology and to assess the strength and formulation preferences of moisturizers prescribed for different dermatological conditions. It was also intended to analyze the duration and frequency of moisturizer use among patients with dermatological conditions.

METHODS

Study Design & Population

This study employs a retrospective, multicenter, cross-sectional design. Data was collected from existing patient records within dermatology outpatient departments (OPDs) across various healthcare settings in India. The study population comprises patients who have previously presented to participating dermatology OPDs in private practices, hospitals, and other healthcare facilities across India. Patient selection for inclusion in the study will be determined by the treating dermatologists based on their clinical judgment. This retrospective data collection will rely on the dermatologists' review of patient records.

Data Collection

This retrospective, multicenter, cross-sectional study gathered data from existing patient records within 2500 dermatology outpatient departments across India. Data extraction will focus on patient demographics, skin types, dermatological conditions, moisturizer selection and prescription details, clinical response, and adverse effects. No additional patient evaluations will be conducted. Participating physicians will enter data into an electronic Case Report Form (eCRF) provided by Alkem Laboratories, following ethical approval and informed consent. After data collection, the data will be analyzed to assess demographic profiles, skin condition distributions, moisturizer selection patterns, clinical responses, and adverse effects. Statistical analysis will be employed to determine the primary endpoints of the study.

Ethical Consideration and Informed Consent

This study, deemed minimal risk according to the Indian Council of Medical Research (ICMR) "Ethical Guidelines for Biomedical Research on Human Participants," received approval from an appropriately constituted Ethics Committee (EC) prior to its commencement. Due to the retrospective nature of the study and the de-identification of patient data, a waiver of informed consent was successfully obtained from the EC. Patient-identifying information was kept strictly confidential, accessible only to authorized investigators, the EC, and relevant regulatory bodies, in accordance with ethical and regulatory standards.

Statistical Analysis

Statistical analyses were conducted using SAS 9.4 and SPSS (version 27). Descriptive statistics, including frequencies and percentages, were used to summarize demographic data and skin characteristics. Chi-square tests were employed to examine associations between categorical variables, such as skin type and moisturizer selection. Paired samples t-tests were utilized to compare pre- and post-treatment moisturizer effects on different dermatological conditions across patient

groups. All statistical analyses were performed with a 95% confidence interval (CI) to ensure the statistical validity of the findings.

RESULTS

The study included a total of 8,392 participants, offering a robust sample for analysis. The mean age was 38.1 years with a standard deviation (SD) of 13.9, indicating a relatively young to middle-aged population, with an age range from 18 to 90 years. The median age of 35 years suggests a slight skew toward younger individuals. The gender distribution (Male-54.3%, Female-45.7%) was relatively balanced. The average weight was 66.7 kg, and the average height was 164.7 cm, indicating a generally healthy adult population in terms of physical metrics.

On average, participants experienced symptoms for 3.0 months (SD: 2.6), or 0.6 years (SD: 1.6), with a median of 2 months. A few outliers with durations up to 50 months (4+ years) or 24 years. A majority of participants were classified as having moderate severity (52.0%), followed by mild (38.8%) and severe (9.2%).

The most prescribed moisturizers were emollients (33.4%) and ceramide-based products (23.6%), reflecting standard treatment practices. Other types included occlusives (21.0%), humectants (12.8%), and combinations (9.2%), highlighting diversity in therapeutic approaches. Lotion (44.7%) was the most used formulation, followed by cream (35.6%) and gel (19.6%). (Refer **Table No. 01**)

Table 1. Demographic and Baseline Characteristics.

	Overall Total (N=8392)
Age (Years)	
n	8392
Mean ± SD	38.1 ± 13.9
Gender, n (%)	
Male	4555 (54.3)
Female	3837 (45.7)
Weight (kg)	
n	8392
Mean ± SD	66.7 ± 11.1
Height (cm)	
n	8392
Mean ± SD	164.7 ± 7.3
Duration Since Onset of Symptoms, (Months)	
n	8392
Mean ± SD	3.0 ± 2.6
Duration Since Onset of Symptoms, (Year)	
n	8367
Mean ± SD	0.6 ± 1.6
Severity Of Condition, n (%)	
Moderate	4365 (52.0)
Mild	3259 (38.8)
Severe	768 (9.2)
Moisturizer Prescribed, n (%)	
Emollient	2804 (33.4)
Ceramide based	1977 (23.6)
Occlusive	1764 (21.0)
Humectant	1073 (12.8)
Combination	774 (9.2)
Formulation, n (%)	
Lotion	3752 (44.7)
Cream	2991 (35.6)
Gel	1649 (19.6)

n: Number of subjects, SD: Standard Deviation, Min: Minimum, Max: Maximum

Table no. 02 presents the distribution of primary diagnoses, focusing solely on specific disease categories. Data from a total of 8392 individuals were analyzed. The most prevalent primary diagnosis was Atopic Dermatitis, affecting 32.36% of individuals. Seasonal dryness and associated symptoms were the second most common at 27.99%. Eczema accounted for 10.00% of the diagnoses, followed by Psoriasis at 6.60% and Acne at 8.09% (which includes cases previously categorized as Acne Vulgaris). Fungal infections and Hyperkeratosis were less frequent, representing 2.22% and 0.70% of the primary diagnoses, respectively.

Table 2. Primary Diagnosis

Primary Diagnosis	Overall Total (N=8392)
Atopic Dermatitis	3716 (44.28)
Seasonal dryness and associated symptoms	2349 (27.99)
Eczema	840 (10)
Psoriasis	550 (6.6)
Acne	679 (8.09)
Fungal	198 (2.35)
Hyperkeratosis	60 (0.7)

Percentages are computed using N provided in the Column Header

Of the 8392 individuals included in the analysis, the most common primary skin type was dry, accounting for 60.42% (5071 individuals). Oily skin was observed in 9.65% (810 individuals), while sensitive skin was noted in 14.48% (1216 individuals). Combination skin was present in 13.88% (1165 individuals), and normal skin was the least frequent, representing 1.65% (139 individuals). (Refer **Table No. 03**)

Table 3. Primary Skin Type.

Primary Skin Type	Overall Total (N=8392)
Dry	5071 (60.42)
Oily	810 (9.65)
Sensitive	1216 (14.48)
Combination	1165 (13.88)
Normal	139 (1.65)

Percentages are computed using N provided in the Column header

The presenting complaints from a total of 8392 individuals revealed that dryness was the most frequent issue, reported by 4385 individuals (52.25%). Rash was the second most common complaint, affecting 1023 individuals (12.19%), closely followed by itching, reported by 1015 individuals (12.09%). Redness was also a notable complaint, experienced by 793 individuals (9.44%). Less frequently reported complaints included pain, affecting 66 individuals (0.78%), and inflammation, which was reported by 192 individuals (2.28%). The percentages provided are calculated based on the total number of individuals (N=8392). (Refer **Table No. 04**)

Table 4. Presenting Complaints

Presenting Complaints	Overall Total (N=8392)
Dryness	4385 (52.25)
Rash	1941 (23.12)
Itching	1015 (12.09)
Pain	66 (0.78)
Inflammation	192 (2.28)
Redness	793 (9.44)

Percentages are computed using N provided in the Column header

Most of the people reported No seasonal variation. Among those who did, *Winter* was the most common whether, followed by Summer and Monsoon. (Refer **Table No. 05**)

Table 5. Seasonal Variation

Seasonal Variation	Overall Total (N=8392)
No	7342 (87.5)
Yes-Winter	697 (8.3)
Yes-Summer	221 (2.6)
Yes-Monsoon	111 (1.3)
Yes-Autumn	21 (0.3)

Percentages are computed using N provided in the Column header

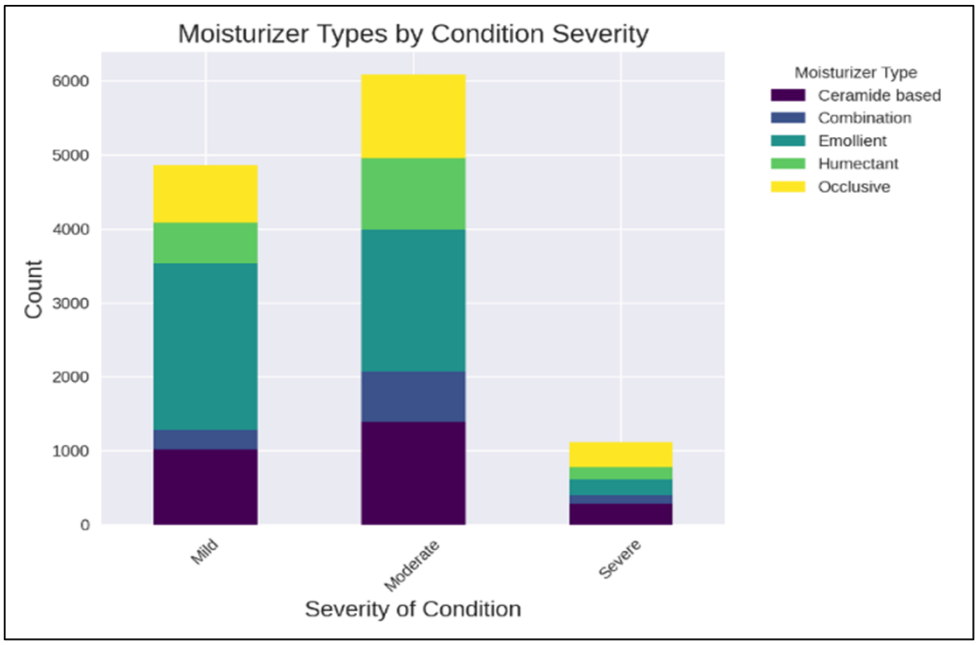
Emollients and ceramide-based moisturizers were the most widely used across all severity levels. Occlusive moisturizers were the preferred choice for severe cases. Combination and humectant moisturizers were the least utilized across all severity levels. (Refer to **Table No. 06** and **Figure No. 01**)

Table 6. Severity Conditions by Moisturizer Type

Severity Condition	Moisturizer Type	Overall Total (N=8392)
MILD	Emollient	1416 (16.9)
	Ceramide Based	723 (8.6)
	Occlusive	622 (7.4)
	Humectant	319 (3.8)
	Combination	179 (2.1)
MODERATE	Emollient	1257 (15.0)
	Ceramide Based	1067 (12.7)
	Occlusive	885 (10.5)
	Humectant	639 (7.6)
	Combination	517 (6.2)
SEVERE	Occlusive	257 (3.1)
	Ceramide Based	187 (2.2)
	Emollient	131 (1.6)
	Humectant	115 (1.4)
	Combination	78 (0.9)

Percentages are computed using N provided in the Column header

Figure 1. Severity of Condition by Moisturizer Type



Emollients were the most prescribed moisturizer that led to improvement. Other moisturizers that helped with improvement include Ceramide Based and Occlusive.
For individuals who experienced no change in their condition, Occlusive and Ceramide Based moisturizers were most frequently used. Very few cases experienced deterioration, with Occlusive and Humectant being the most common moisturizers in those instances.
A Chi-Square test was used, and the p-value (<0.0001) indicates a strong association between the type of moisturizer and the clinical outcome, suggesting that the moisturizer plays a significant role in treatment success. (Refer **Table No. 07**)

Table 7. Clinical Outcomes of Prescription Moisturizer

	Prescribed Moisturizer	**Overall Total (N=8392)**	**P-value**
Improvement	Emollient	2671 (31.8)	<0.0001
	Ceramide Based	1794 (21.4)	
	Occlusive	1552 (18.5)	
	Humectant	876 (10.4)	
	Combination	734 (8.7)	
No Change	Occlusive	187 (2.2)	
	Ceramide Based	178 (2.1)	
	Humectant	177 (2.1)	
	Emollient	120 (1.4)	
	Combination	36 (0.4)	
Deterioration	Occlusive	25 (0.3)	
	Humectant	20 (0.2)	
	Emollient	13 (0.2)	
	Ceramide Based	5 (0.1)	
	Combination	4 (0.0)	

Percentages are computed using N provided in the Column header P-value: Based on Chi-Square test.

The most common prescribed frequency for Emollient, Ceramide Based, and Occlusive moisturizers was twice daily, followed by once daily. Other application frequencies were rare. A Chi-Square test showed a significant association between moisturizer type and prescribed frequency (p-value < 0.0001). (Refer to **Table No. 08**)

Table 8. Prescribed Moisturizers and Their Frequency.

Prescribed Moisturizer	**Frequency of Use**	**Overall Total (N=8392)**	**P-value**
Emollient	Twice Daily	2027 (24.2)	<0.0001
	Once Daily	741 (8.8)	
	Other- two Times Daily	35 (0.41)	
	Other-Thrice Dailly with Coconut Oil	1 (0.0)	
Ceramide Based	Twice Daily	1628 (19.4)	
	Once Daily	338 (4.0)	
	Other-Thrice A Day	9 (0.10)	
	Any Other - - Times A Day	2 (0.02)	
Occlusive	Twice Daily	1574 (18.8)	
	Once Daily	183 (2.2)	
	Any Other - Thrice	5 (0.05)	
	Any Other - Times A Day	2 (0.02)	

Percentages are computed using N provided in the Column header P- value: Based on Chi-Square test.

DISCUSSION

This retrospective, multicenter, cross-sectional study offers a comprehensive view of moisturizer use in Indian dermatology outpatient settings. The analysis of patient records from various dermatology outpatient departments across India provides a broad understanding of current clinical practices. The study's findings, based on data from 8392 patients, illuminate the

prevalence of specific dermatological conditions and moisturizer prescription patterns in this population. The large sample size enhances the generalizability of the results to the wider Indian population seeking dermatological care.

The results indicate that Atopic Dermatitis (including its variations) and Dryness are the most commonly encountered dermatological conditions. This highlights the significant role these conditions play in Indian dermatological practice and the importance of effective management strategies. The variations in how Atopic Dermatitis is recorded in the source document point to the necessity of combining similar terms for a more accurate analysis. This reflects a data management challenge and the need for standardized terminology in medical records for research.

A review article emphasizes that moisturizers are essential in managing atopic dermatitis by restoring the damaged skin barrier, a core aspect of the disease's pathophysiology. Therapeutic moisturizers with ceramides, pseudo ceramides, and natural moisturizing factors have been developed, with several receiving FDA approval. Research suggests that a balanced lipid mixture of ceramides, cholesterol, and free fatty acids (3:1:1 ratio) improves barrier restoration. Many formulations also include anti-inflammatory and antibacterial substances, although their efficacy is debatable. Regular and appropriate moisturizer use is crucial for symptom relief, but its role in preventing atopic dermatitis is unclear due to inconsistent research findings[31].

A survey of 58 dermatologists across India evaluated the efficacy of a novel skin moisturizer, Atoderm Intensive Baume, in managing atopic dermatitis among 1605 patients. Nearly all dermatologists (98%) considered it effective, noting improvements in skin dryness, pruritus, inflammation, sleeplessness, and itching. The moisturizer was well-tolerated and significantly repaired the damaged skin barrier. These findings suggest that Atoderm Intensive Baume is a preferred and effective option for managing atopic dermatitis in clinical practice[32].

Another questionnaire-based study in India analyzed acne epidemiology among 6409 individuals (45% males, 55% females, mean age 24.64 years). High glycemic diets (50%) and smoking (14%) were common factors. Grade II acne (47%) and inflammatory papular acne (51%) were more prevalent, with hyperpigmentation (35%) and scarring (29%) indicating severity. Supportive skincare measures were widely used, with cleansers prescribed for 53% of patients and moisturizers for 43%, highlighting their role in acne management[33].

The study reveals a preference for emollient-based moisturizers, followed by ceramide-based formulations. This prescribing pattern likely reflects the dual goals of moisturizing: to soothe and hydrate the skin and to repair the skin barrier. Emollients soften and smooth the skin by replenishing lost lipids and smoothing folded corneocyte edges, reducing friction and improving perceived skin softness. Ceramides are crucial for restoring barrier function by minimizing trans-epidermal water loss (TEWL) and repairing the damaged skin barrier, often compromised in various dermatological conditions.

A randomized controlled trial in the US and UK with 124 high-risk neonates found that daily full-body emollient therapy from birth significantly reduced the cumulative incidence of atopic dermatitis by 50% at 6 months (P = .017). The intervention was well accepted, with no emollient-related side effects. These findings suggest that early emollient use is a feasible, safe, and potentially effective strategy for preventing atopic dermatitis, warranting larger trials for validation.[34]

A systematic review of 10 randomized controlled trials (2000–2020) assessed the impact of early emollient use on atopic dermatitis prevention. Overall, emollients did not significantly reduce atopic dermatitis risk (RR 0.84, 95% CI 0.64–1.10), but showed potential benefits in high-risk infants (RR 0.75) and when administered continuously until atopic dermatitis evaluation (RR 0.59). The findings suggest that early emollient use may delay rather than fully prevent atopic dermatitis, particularly in high-risk populations. [35]

Lotion and cream formulations are the most used, indicating their versatility and suitability for widespread application and various skin needs. Lotions are often preferred for larger body areas due to their lighter texture and ease of spread ability, while creams are favored for more targeted treatment of drier areas, offering a richer, more occlusive effect. The preference for twice-daily application of moisturizers suggests a standardized clinical approach aimed at maintaining consistent skin hydration and optimizing treatment outcomes. This frequency likely reflects the need for regular and consistent moisturization to effectively manage skin conditions.

A real-world observational trial in India (CTRI/2017/03/008023) assessed the efficacy, safety, and compliance of an intense plant-based butter moisturizing cream (Venusia Max) in 400 psoriasis patients. Over 4 weeks, there was a significant improvement in quality of life (DLQI score reduction of 66.7%, $p<0.001$) and skin dryness (DASI score reduction of 84.6%, $p<0.001$). The cream demonstrated a good safety profile with no serious adverse events. These findings indicate that the moisturizer may be a valuable adjuvant therapy for managing psoriasis-related skin dryness and improving patient quality of life[36].

The study also reveals a relationship between condition severity and moisturizer type. Emollients are generally preferred for milder conditions, likely due to their gentle hydrating and smoothing effects. In contrast, occlusive and ceramide-based moisturizers are more frequently used in moderate to severe cases. Occlusives, like petrolatum, form a protective barrier on the skin, reducing water loss and

enhancing the intercellular matrix, which is particularly beneficial when the skin barrier is significantly compromised.
The clinical outcomes demonstrate the effectiveness of prescribed moisturizers, with a large majority of patients experiencing improvement in their condition. This high rate of improvement underscores the therapeutic value of moisturizers in managing various dermatological conditions. The incidence of adverse reactions to moisturizers was extremely low, further supporting their safety profile. This aligns with the understanding that moisturizers are generally well-tolerated and considered a safe treatment option.
While this study offers valuable insights, it does not include demographic details such as age, gender, or ethnicity, which could have provided a more refined analysis of moisturizer use across different patient populations. Future prospective studies with a more precise demographic breakdown and standardized reporting of outcomes are needed to further validate these findings.

CONCLUSION

This study provides valuable insights into the prevalence and management of dermatological conditions in India, with a focus on moisturizer prescription patterns. The findings emphasize the importance of moisturizers, especially emollient and ceramide-based formulations, in addressing common conditions like atopic dermatitis and dryness. The data supports evidence-based prescribing practices, where treatment modalities are tailored to the specific condition and its severity. The demonstrated efficacy and safety of prescribed moisturizers reinforce their essential role in dermatological care. These results have significant implications for clinical practice, informing optimal skincare strategies and guiding future research and product development in India.

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