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The Anatomical Tax: Annual Cost of Adherence to American Academy of Dermatology Recommended Skin Care Regimens

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Abstract

The cumulative financial cost of over-the-counter (OTC) skin maintenance has not been established and introduces a critical, unrecognized barrier to dermatological care and prevention. Prior economic analyses have largely evaluated product classes rather than the full cost of a dermatologist-recommended OTC regimen.
We quantified the Annual Cost of Adherence (ACA) for an American Academy of Dermatology (AAD)-recommended essential and comprehensive OTC regimen and evaluated the financial impact of marketing across retail channels. A cross-sectional, market-basket economic analysis was conducted from January 24 to February 24, 2026. Data were systematically extracted for the top 20 best-selling products across seven distinct skin-care categories from the websites of four major US retailers (Amazon, Target, Walmart, and Walgreens). The primary outcome was the ACA, calculated by multiplying the median unit price by annual volumetric requirements derived from established dermatologic standards for a standard adult body surface area of 1.76 m^2. Secondary outcomes included market variance and analysis of market premiums through two-sided Mann-Whitney U tests and Kruskal-Wallis H tests. A total of 522 dermatologic OTC products met the inclusion criteria. The Essential regimen (facial cleanser, moisturizer, and sunscreen) yielded a median ACA of $515 ($69–$2,353). The Comprehensive regimen (Essential plus body moisturizer, body sunscreen, topical retinoid, and vitamin C) yielded a median ACA of $1,395 ($292–$7,988). Descriptive analysis revealed extreme price variance, with facial moisturizers exhibiting an 82.4-fold difference. A significant "anatomical tax" was observed as facial moisturizers (median, $7.39/oz) were significantly more expensive than body moisturizers (median, $0.67/oz; P < .001), accounting for the majority of pricing variance ($\eta^2 = 0.72$). A similar premium was observed for facial sunscreens (median, $7.52/oz) compared to body sunscreens (median, $3.20/oz; *P* < .001).The annual financial burden of an AAD-recommended skin maintenance regimen is substantial. Dermatologists are uniquely positioned to mitigate this financial toxicity through practical, zero-cost interventions: recommending bulk, body-labeled products for facial use, encouraging the consideration of store-brand generics, and considering prescription retinoids over OTC equivalents.

Keywords: Skin care; Cost of care; Financial toxicity; Over-the-counter products; Sunscreen; Health equity

Introduction

The over-the-counter (OTC) skin-care market has experienced significant growth over the past decade, representing the largest segment of the broader beauty industry with projections exceeding $230 billion by 2030 [1–4]. A 2024 survey revealed that half of US adults (50%) maintain a consistent skin-care routine with higher proportion of women endorsing daily habits (60%) than men (39%) [5]. This behavioral shift and growth are heavily fueled by targeted marketing and algorithmic social media, promoting multi-step skin-care regimens [6, 7]. For instance, a 2025 analysis of TikTok skin-care videos aimed at adolescent and pediatric demographics found that posted routines averaged six products with a mean cost of $168 per routine, yet only included sunscreen 26.2% of the time [7]. Conversely, male consumers demonstrate distinctly different utilization patterns; a recent survey of 705 men found that the most frequent skincare products used were liquid soap/body wash (65%) and bar soap (47%) with most men (83%) reporting not using sunscreen daily [8]. Despite this escalating consumer complexity and cost of the OTC market, the American Academy of Dermatology (AAD) recommends a simple, evidence-based regimen consisting solely of cleansing, moisturizing, and sun protection, with the targeted addition of a Vitamin C serum and/or a topical retinoid for adults seeking preventative anti-aging care [9, 10].

The cumulative out-of-pocket cost of this growth of the OTC market introduces a critical and underrecognized barrier to dermatologic care: financial toxicity. Originally recognized in oncology to describe the systemic cost of medical care, financial toxicity is highly relevant to dermatology, where cost and insurance challenges are recognized barriers to seeking care and treatment adherence [11, 12].

These pressures extend beyond prescription therapies; in a US study of atopic dermatitis patients, 94.3% of respondents reported spending up to $50 on moisturizers/emollients and up to another $50 on other non-prescription medications (e.g., hydrocortisone, allergy medication, hygiene/bathing products) [13]. The financial implications can be seen in sunscreen use where individuals with lower incomes are more likely to perceive sunscreen as unaffordable and use it less than those with higher incomes (household income ≥ $50,000) [8, 14, 15]. Altogether, the recurring cost of OTC skin maintenance represents a substantial, unquantified economic burden.

Prior economic analyses in dermatology have quantified the cost of sunscreen in isolation, characterized pricing variation in best-selling moisturizers, and compared selected anti-aging active agents across retailers [15–18]. However, these studies have largely evaluated individual product classes rather than the full annual cost of a dermatologist-recommended OTC regimen, leaving the real-world affordability of routine skin maintenance incompletely defined. In this study, we analyze the Annual Cost of Adherence (ACA) for two AAD-based baseline OTC regimens: 1) An *Essential* regimen consisting of facial cleanser, facial moisturizer, and facial sunscreen, and 2) A *Comprehensive* regimen that adds body moisturizer, body sunscreen, topical retinoid, and vitamin C. We examined four major US retail channels to determine real-world affordability.

Methods

Study Design and Product Selection

Institutional Review Board approval was waived because the study relied exclusively on publicly available, non-human-subjects data. A cross-sectional, market-basket economic analysis was conducted from January 24 to February 24, 2026 to evaluate the out-of-pocket financial burden of over-the-counter (OTC) dermatologic regimens.

Data were systematically extracted from the websites of four major US retailers representing diverse distribution channels: e-commerce (Amazon.com), big-box retailers (Target, Walmart), and national pharmacy chains (Walgreens). CVS was excluded as sorting by best-sellers was unavailable on its platform. To control for geographic price variability and algorithmic personalization, all brick-and-mortar retailer queries were localized to a standardized Midwestern demographic (ZIP Code 55401) and extracted using a private browsing window (Google Chrome Incognito).

The top 20 best-selling products were extracted across seven distinct skin care categories using the search terms: “Facial Cleanser”, “Facial Moisturizer”, “Facial Sunscreen”, “Body Moisturizer”, “Body Sunscreen”, “Retinoid”, and “Vitamin C Serum”. The listed price, product size (oz), price-per-ounce, URL, active ingredients, ingredient list, and fragrance (yes/no) were extracted. To standardize pricing, a single-unit largest-size protocol was utilized, selecting the largest single-unit size to capture maximum consumer volume. Analysis was limited to primary application vehicles (lotions, creams, and gels). Secondary or “spot-treatment” vehicles (patches, wipes, sticks, balms, sprays, and powders) were excluded from the final dataset as these application modalities lack standardized volumes for application.

Derivation of Clinical Volume and Annual Cost

The Annual Cost of Adherence (ACA) was calculated by multiplying the unit price per ounce ($/oz) by the annual volumetric requirement for each product category based on established dermatologic standards applied to a “standard adult” body surface area (BSA) of 1.76 m^2 [19]. For photoprotection, volumetric needs were derived using the FDA-mandated testing application density of 2.0 mg/cm² applied to regional BSA estimates [20, 21]. For non-SPF topical products, volumetric requirements were calculated using the Fingertip Unit (FTU; approximately 0.5 g per 2% BSA) to reflect real-world clinical application parameters [22]. Grams were subsequently converted to US fluid ounces to align with standard retail sizing.

Annual requirements were modeled based on AAD recommended frequencies, assuming twice-daily (BID) use for cleansers and moisturizers, and once-daily (QD) use for photoprotection and active agents. Calculations were performed to specific anatomical locations such as the face and neck (5.5% BSA) for the essential regimen, and sun-exposed extremities (30% BSA) for comprehensive regimen (Table 1). A complete mathematical derivation of anatomical constants, conversion formulas, and category-specific volumes is provided in Supplementary Material 1.

Table 1. Product Category and Annual Volumes

Product Category	Anatomical Area	% BSA	Frequency	Amount per App (oz)	Annual Volume (oz)
Retinoid	Face	3.5%	QD	0.03 oz	**11.3 oz**
Vitamin C Serum	Face	3.5%	QD	0.007 oz	**2.57 oz**
Facial Moisturizer	Face + Neck	5.5%	BID	0.05 oz	**35.4 oz**
Facial Cleanser	Face + Neck	5.5%	BID	0.05 oz	**35.4 oz**
Facial SPF	Face/Neck/Ears	6.0%	QD	0.07 oz	**27.2 oz**
Body SPF	Sun-Exposed Areas	30.0%	QD	0.37 oz	**136.0 oz**
Body Moisturizer	Sun-Exposed Areas	30.0%	BID	0.26 oz	**193.1 oz**

Abbreviations: AAD, American Academy of Dermatology; ACA, annual cost of adherence; BSA, body surface area; IQR, interquartile range; OTC, over-the-counter. **a** Annual volumetric requirements were calculated assuming a standard adult body surface area of 1.76 m^2. Photoprotection volumes were calculated utilizing the standard 2.0 mg/cm^2 application density.

Two theoretical regimens were evaluated based on American Academy of Dermatology (AAD) baseline recommendations: an Essential Regimen (facial cleanser, facial moisturizer, facial SPF) and a Comprehensive Regimen (Essential Regimen + body moisturizer, body SPF, topical retinoid, and vitamin C) [9, 10].

Statistical Analysis

Because OTC cosmetic pricing distributions are inherently right-skewed due to luxury brand outliers, non-parametric statistical methods were employed. Descriptive statistics, including medians, interquartile ranges (IQR), and absolute ranges (minimum–maximum), were calculated for both unit price ($/oz) and annual cost ($). The Fold-Difference (maximum price divided by minimum price) was utilized to quantify market variance.

To evaluate systemic pricing differences across the four retailers, a Kruskal-Wallis H test was performed, followed by a post-hoc Dunn's test with Bonferroni correction for multiple comparisons. To assess the financial impact of cosmetic marketing (face versus body products, and fragrance-free formulations), continuous variables were compared using two-sided Mann-Whitney U tests. For all inferential statistics, effect sizes were calculated using eta-squared (η^2) to determine the magnitude of variance explained by the independent variables. An $\eta^2 > 0.14$ was considered a large effect. A *P* value of <.05 was considered statistically significant.

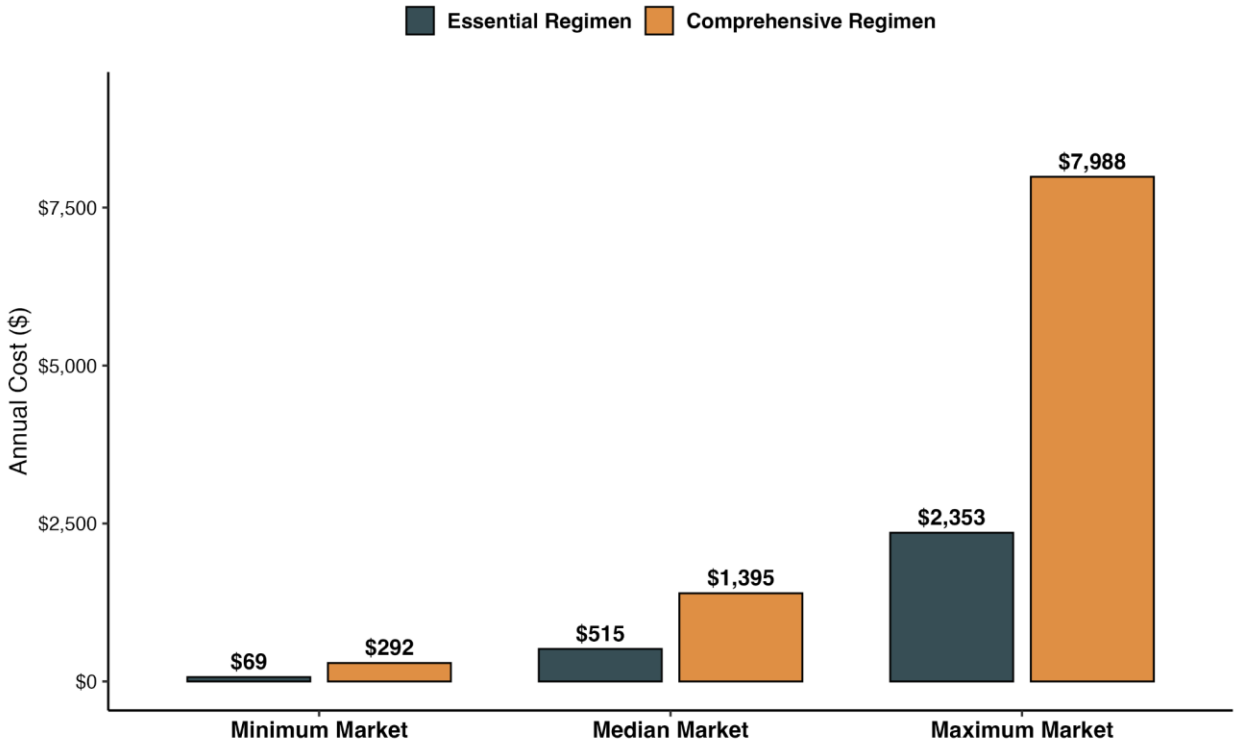
Scenario-based economic modeling was utilized to project the absolute minimum, median, and maximum market costs of the Essential and Comprehensive regimens. All data cleaning, visualization, and statistical analysis were performed using R software version 4.5.0 (R Foundation for Statistical Computing, Vienna, Austria) using the *tidyverse, ggplot2,* and *rstatix* packages.

Results

A total of 522 dermatologic OTC products met the inclusion criteria after the exclusion of secondary vehicles (sticks, balms, and aerosolized sprays). The annual cost of adherence to follow an essential AAD-recommended skin-care regimen yielded a median cost of $515, ranging from $69 to $2,353. In contrast, a Comprehensive skin-care regimen has a median annual cost of $1,395 with a range of $292 to $7,988 (Figure 1). Notably, while vitamin C serums and retinoids commanded the highest median price-per-oz when comparing all product categories (Figure 2), the high-volume and high-frequency requirements of body sunscreen and high median price-per-oz of face moisturizers ultimately drove the bulk of the comprehensive regimen's cumulative cost (Table 2, Figure 1).

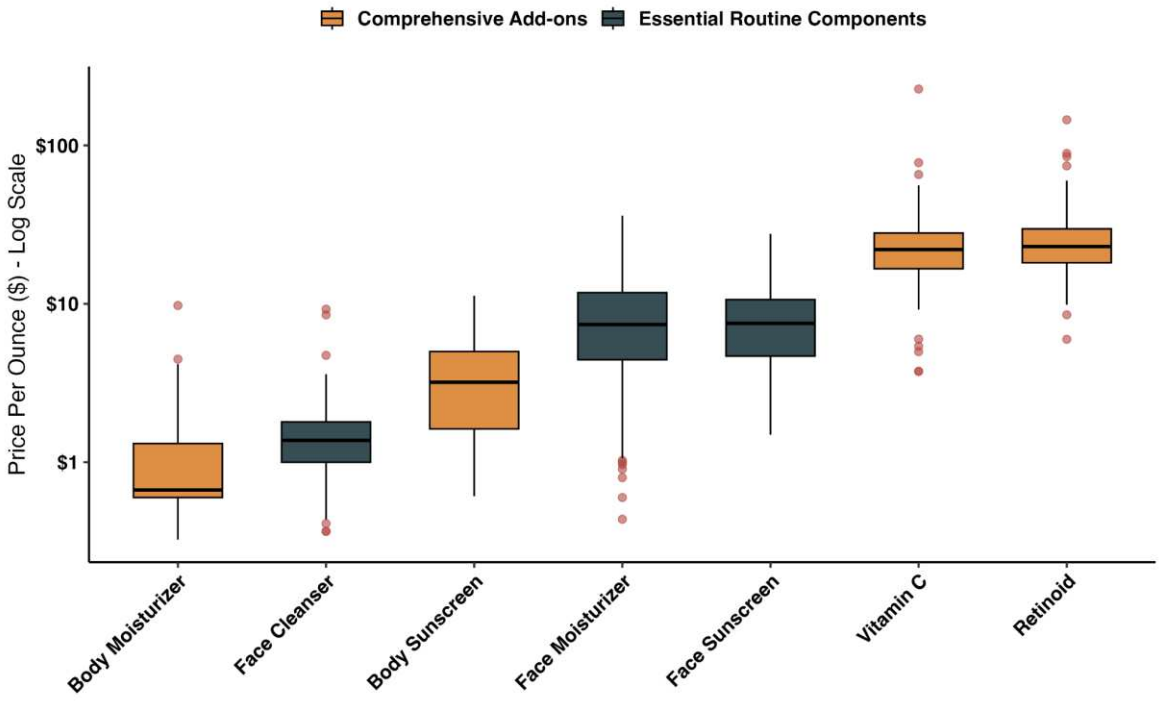
Annual Cost Scenarios Based on Market Selection

Financial toxicity modeled across absolute minimum, median, and maximum market prices



Distribution of Unit Price ($/oz) by Product Category

Logarithmic scale highlights the 'Fold-Difference' variance in the OTC market



Descriptive analysis revealed extreme price variance within product categories with face moisturizers having the greatest price variability with an 82.4-fold difference (Table 2). Vitamin C serums also exhibited high market variance with unit prices ranging from $3.74/oz to $227.01/oz (a 60.6-fold difference). The lowest price variance was found in body sunscreens with an 18.5-fold difference with unit prices ranging from $0.61/oz to $11.24/oz (Table 2).

Baseline hygiene products were the most financially accessible with body moisturizers and face cleansers having median unit prices of $0.67/oz and $1.37/oz respectively. However, the median annual cost of body moisturizer ($129.10) was nearly triple that of a face cleanser ($48.63) given the greater body surface area (BSA) coverage it required.

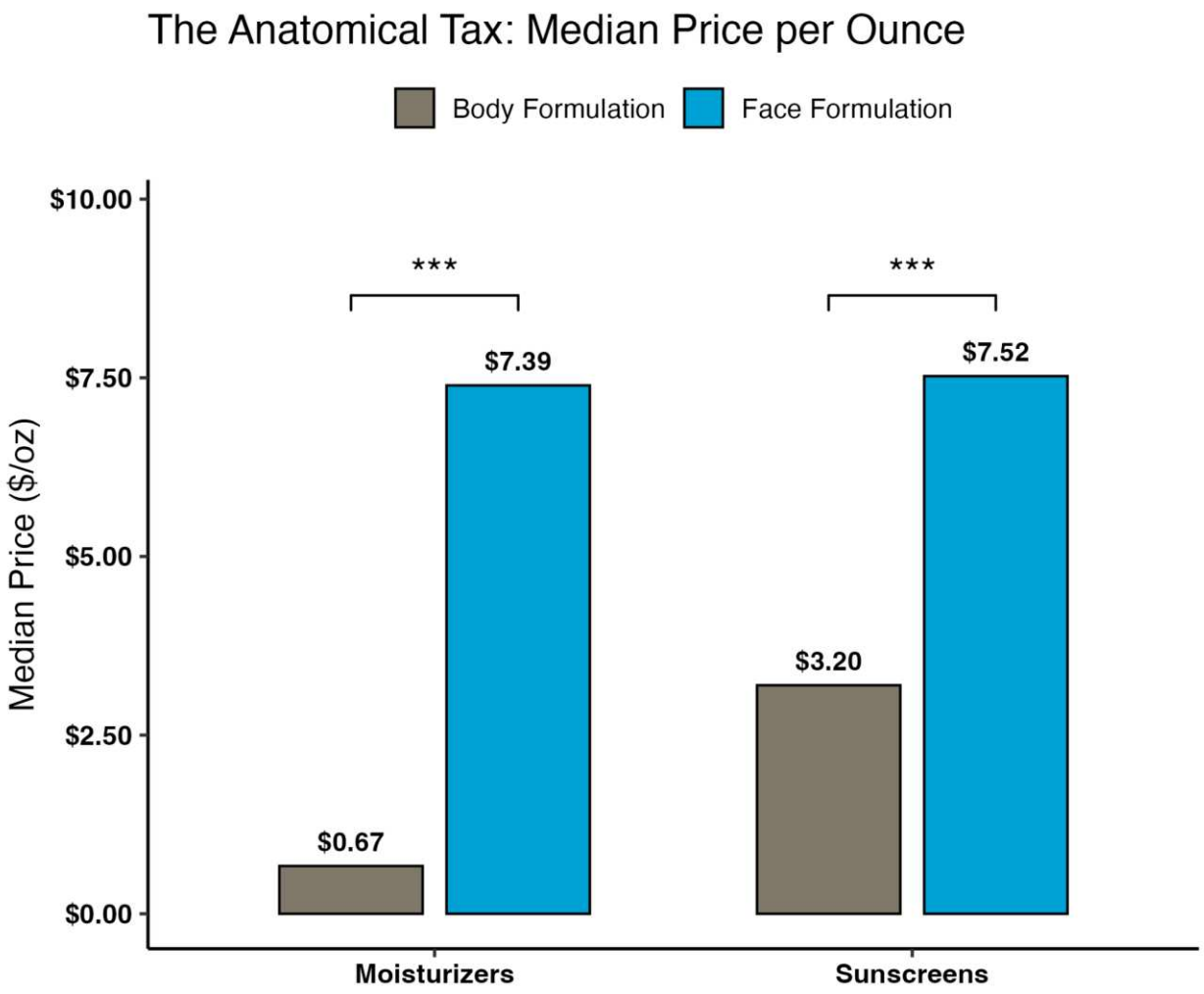
Table 2: Descriptive Pricing Statistics and Annual Cost Projections by Dermatologic Product Category

Product Category	N Products	Median Price Oz	Price Oz Range	Fold Difference	Median Annual Cost	IQR Annual Cost	Annual Cost Range
Face Cleanser	79	$1.37	$0.37 - $9.25	25.3x	$48.63	$28.21	$12.97 - $327.45
Vitamin C	77	$21.99	$3.74 - $227.01	60.6x	$56.51	$29.12	$9.62 - $583.42
Body Moisturizer	78	$0.67	$0.32 - $9.76	30x	$129.10	$137.91	$62.73 - $1,884.72
Face Sunscreen	74	$7.52	$1.49 - $27.65	18.5x	$204.64	$161.93	$40.56 - $752.00
Retinoid	78	$23.00	$5.97 - $144.97	24.3x	$259.90	$130.48	$67.46 - $1,638.17
Face Moisturizer	79	$7.39	$0.44 - $35.98	82.4x	$261.73	$259.08	$15.47 - $1,273.69
Body Sunscreen	57	$3.20	$0.61 - $11.24	18.4x	$434.93	$458.72	$82.96 - $1,528.19

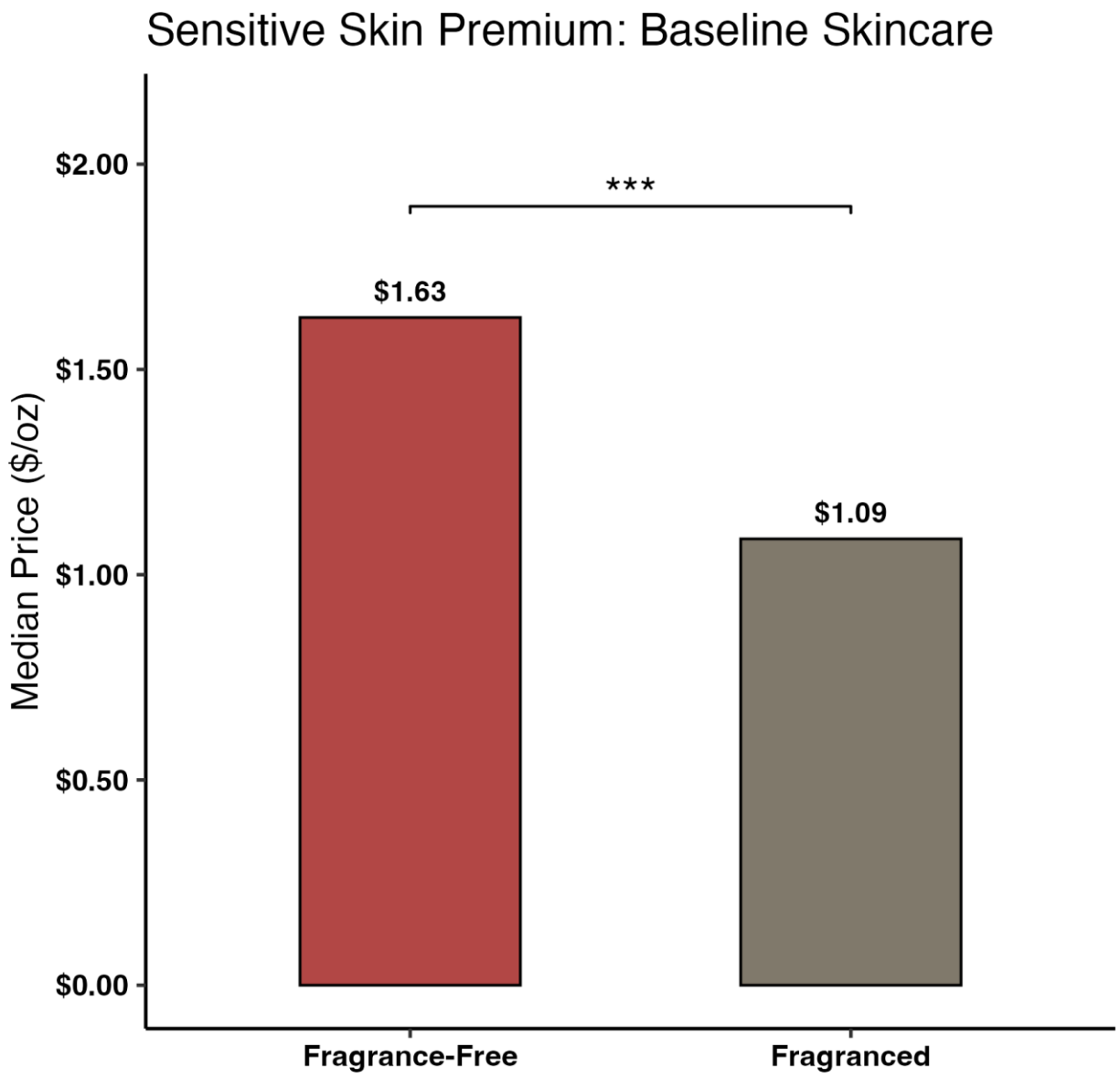
The Anatomical Marketing Premium

To evaluate the economic impact of anatomical marketing, the unit prices ($/oz) of moisturizers and sunscreens were compared for the face and body (Figure 3). A two-sided Mann-Whitney U test found that face moisturizers (median, $7.39/oz) were significantly more expensive than body moisturizers (median, $0.67/oz; $P < .001$). Similarly, a significant anatomical premium was observed in sunscreens with face sunscreens (median, $7.52/oz) being significantly more expensive than body sunscreens (median, $3.20/oz; $P < .001$).

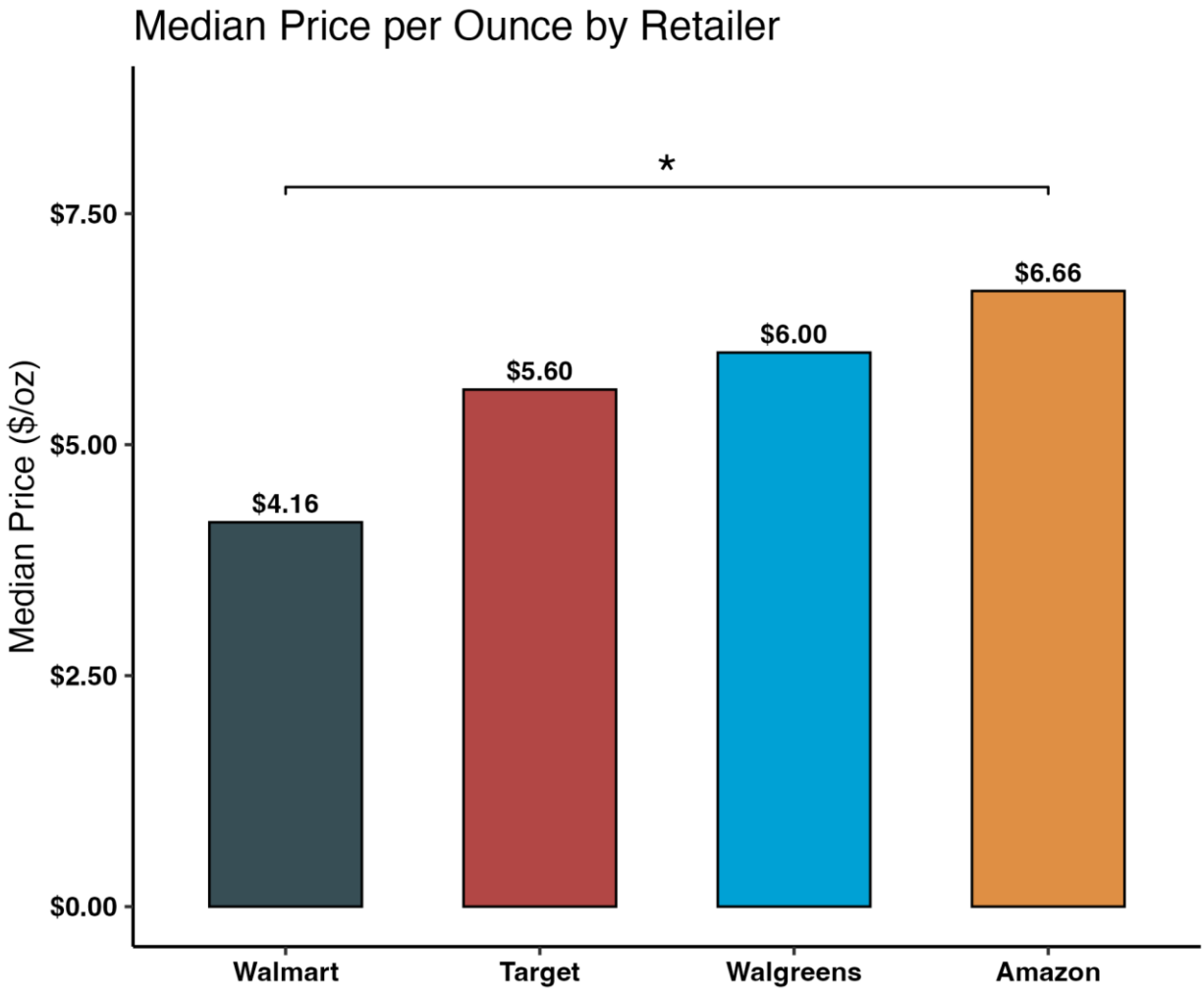
Effect size analysis showed that the labeling of face or body had a large effect on pricing with $\eta^2_{moisturizer} = 0.72$ when comparing moisturizers, indicating that 72% of variance of moisturizer was explained solely by face or body classification. Anatomical labeling also had a large effect on pricing for sunscreens ($\eta^2_{sunscreen} = 0.52$).



When comparing baseline skin-care products (face cleansers, face moisturizers, and body moisturizers), products that were marketed as “fragrance-free” or had no fragrance in their ingredient list had a statistically significant premium compared with their fragranced counterparts ($P < .001$). However, the effect size of the fragrance free mark-up ($\eta^2_{\text{fragrance-free}} = 0.24$) was smaller in comparison to premium driven by anatomical marketing (Figure 4).



A post-hoc Dunn's test with Bonferroni correction was performed to evaluate systemic pricing disparities across the four major retailers (Amazon, Target, Walgreens, and Walmart). Only the comparison between Amazon and Walmart reached statistical significance (adjusted *P* = .046); no other pairwise retailer comparison differed significantly (all adjusted P > .05) (Figure 5).



Discussion

While prior analyses have examined the cost of select product categories within the AAD recommended skin care regimen (cleansing, moisturizing, and protecting), no study has quantified the full annual cost of adherence to these recommendations [9, 16–18, 23]. In our analysis, the Essential regimen yielded a median ACA of $515 whereas the ACA of the Comprehensive regimen (including body sunscreen, body moisturizer, topical retinoid, and vitamin C serum) reached $1,395, equivalent to approximately 9% of the total annual income of a single individual at the 2026 federal poverty level of $15,960 [24].

One clinically actionable finding from our study is the degree to which the cosmetics industry inflates cost through anatomical segmentation. When a moisturizer is labeled “for the face” rather than “for the body,” the per ounce price increases by roughly 11-fold (median $7.39/oz vs. $0.67/oz), even with similar ingredient profiles. The face-versus-body designation alone accounted for the majority of pricing variance in both moisturizers and sunscreens with a larger effect than any other measured variable,

including retailer or fragrance status. To our knowledge, this “anatomical tax”, though well known by clinicians and those familiar with the skincare product space, has not been previously quantified in the literature. Prior analyses have excluded products labeled for face, or pooled facial and body formulation together without stratifying cost per product labeled anatomical region, leaving the pricing disparity between marketed product types undercharacterized [17, 25]. Notably, facial and body moisturizers share the same core ingredient classes (e.g., occlusives, emollients, and humectants), therefore the patient who opts for a bulk-sized body cream containing ceramides and hyaluronic acid instead of a “for face” labeled product could substantially reduce annual moisturizer expenditure. Ultimately, clinicians should continue to weigh individual factors including acne susceptibility and cosmetic preference when providing product recommendations.

Photoprotection was among the costliest regimen components, consistent with Mundada et al., who estimated the annual cost of sunscreen to range from $39.28 to $1429.42 depending on indoor versus outdoor job types, sunscreen unit price, and photoprotective clothing habits [25]. Our data extend this finding by demonstrating that the anatomical premium seen in moisturizers is also present in sunscreens. Again, face-labeled products cost markedly more per ounce when compared to body-labeled equivalents ($7.52 versus $3.20 per oz). Individuals with lower incomes are already more likely to cite cost as a barrier to purchasing sunscreen [15]. Thus, clinicians should encourage patients within this group to especially consider bulk-sized or body-labeled sunscreens as opposed to premium face-specific formulations. This recommendation, coupled with counseling on photoprotective clothing and shade seeking within peak UV hours, can reduce cost while promoting a more comprehensive approach to sun protection.

In considering health equity, it should be noted that pricing across most major retailers showed no statistical significance, with the sole exception of Amazon and Walmart. The financial burden of OTC skincare is less about where individuals decide to shop, rather what they choose to purchase within product categories. Oftentimes, store-brand products (e.g., Target’s Up&Up and Walmart’s Equate) are formulated with many of the same active ingredients found in name brands for a discount in the per-ounce price. Clinicians should explicitly encourage patients to consider generic store-brand alternatives, pending appropriate formulation, to decrease the regimen sticker price for those who may otherwise believe lower-priced store-brand options are inferior in efficacy or quality.

The cosmetic additions within the Comprehensive regimen directly escalated cost projections. Daily body sunscreen and retinoids, with respective median annual expenditures of $434.93 and $259.90, together approached the entire cost of the Essential regimen at median market prices. For retinoids in particular, generic tretinoin cream (0.025%-0.1%) is available through discount pharmacy programs at a cost of approximately $29 to $71 per 45-g tube, and may cost considerably less for those with insurance coverage for prescription drugs [26]. While direct cost comparison requires insight into prescribing patterns and patients’ insurance status, prescription tretinoin offers a substantially stronger evidence profile for photoaging reversal when compared

to OTC retinol and may be a more cost-friendly option for many patients with appropriate indications for prescription.

Limitations of this study include its cross-sectional design with data captured in February 2026 from digital storefronts that do not account for in-store variation, or promotional deals, discounts, and coupons. Further, the power and generalizability of our findings are likely decreased by the exclusion of CVS in our analysis due to its lack of a standardized “best-sellers” sort function. Notably, our annual cost of adherence model assumes full daily adherence at a standardized contemporary adult body surface area (1.76 m^2) representing an upper limit of patient adherence as opposed to true patient application habits, especially for body applications.

Conclusion

Our findings suggest dermatologists are uniquely positioned to mitigate the financial toxicity of AAD recommended routine skin care through three practical, zero-cost interventions: recommending bulk, body-labeled products for facial use, encouraging the consideration of store-brand generics, and consideration of prescription retinoids over OTC equivalents.

Statements and Declarations

Author contributions: K.T.L.T. and A.B.F. contributed to study conception and design, data collection, analysis, and drafting of the manuscript. N.K. contributed to data collection and analysis. R.P.D. and C.R. contributed to study supervision and critical revision. All authors reviewed and approved the final manuscript and agree to be accountable for all aspects of the work.

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Ethics approval: This study did not involve human participants or animals. Institutional Review Board review was waived because the analysis relied exclusively on publicly available, non-human-subjects data.

Consent to participate: Not applicable.

Consent to publish: Not applicable.

Data availability: The dataset generated and analyzed during the current study, comprising publicly listed retail prices and product characteristics for the 522 included products, is available from the corresponding author on reasonable request.

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Figure Legends

Figure 1. Annual Cost Scenarios Based on Market Selection: Grouped bar chart illustrating the modeled Annual Cost of Adherence (ACA) for the Essential and Comprehensive dermatologic regimens. Costs are projected across the absolute minimum, median, and maximum market unit prices to demonstrate the spectrum of financial toxicity.

Figure 2. Distribution of Unit Price ($/oz) by Product Category. Box-and-whisker plot demonstrating the right-skewed variance of the over-the-counter market. A logarithmic scale is utilized to accommodate high-variance luxury outliers (red dots). The central line represents the median, box edges represent the interquartile range (IQR), and whiskers extend to 1.5 times the IQR.

Figure 3. The Anatomical Tax: Median Price per Ounce. Grouped bar chart comparing the median unit price of equivalent formulations marketed for the face versus the body. Brackets indicate statistical significance derived from two-sided Mann-Whitney U tests (*** = $P < .001$).

Figure 4. Sensitive Skin Premium: Baseline Skincare. Bar chart comparing the median unit price of fragranced baseline products versus those marketed as fragrance-free. The bracket indicates statistical significance derived from a two-sided Mann-Whitney U test (*** = $P < .001$).

Figure 5. Median Price per Ounce by Retailer. Bar chart illustrating the median unit price across four major retail channels. The bracket indicates pairwise statistical significance derived from a post-hoc Dunn's test with Bonferroni correction following a Kruskal-Wallis H test (* = adjusted $P < .05$).

Supplementary Files

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- eAppendix.docx