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Original Research Article

Assessment of sunscreen usage among adults in the metropolitan area of Puerto Rico: implications for skin cancer prevention

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ABSTRACT

Background: Skin cancer incidence is rising in Puerto Rico. However, there is limited data on sunscreen knowledge and behaviors. This study evaluates these factors in Puerto Rico's metropolitan area to identify barriers to effective sun protection and address a critical gap in the literature.
Methods: A 31-question survey evaluated sunscreen behaviours, knowledge and perceptions among 205 adults in Puerto Rico's metropolitan area. Participants were recruited via QR codes and clinic referrals, with data analyzed using descriptive statistics, Chi-square and t-tests with significance set at $p<0.05$.
Results: While 83.41% acknowledged sunscreen's role in preventing skin cancer, only 33.17% reported daily application. Among those who use sunscreen, 21.0% reported that they do not reapply it throughout the day. Additionally, 13.17% stated that timing of application does not matter as long as sunscreen is applied. Half of participants (50.24%) reported using an arbitrary amount instead of the recommended 1 ounce (approximately a shot-glass full) for full-body coverage. Females reported significantly higher daily use (39.74% vs. 14.81%, $p=0.001$) and greater concern about skin cancer all the time (40.40% vs 14.81%, $p<0.0001$). Younger adults had higher sunburn rates (84.62% vs. 50.88%, $p<0.001$) and more frequently identified the correct reapplication interval (48.35% vs. 23.68%, $p<0.001$).
Conclusions: The study highlights critical gaps in sunscreen use and knowledge specific to Puerto Rico, particularly among younger adults and males. Targeted education on correct sunscreen uses and the risks of inadequate protection is essential to reduce the rising incidence of skin cancer in Puerto Rico.

Keywords: Sunscreen usage, Skin cancer, Sun exposure risks, Sun protection behaviors

INTRODUCTION

Skin cancer is the most common cancer worldwide.[1] It is estimated that at least one in five Americans will develop skin cancer each year in the U.S. by the age of seventy.[1] Moreover, the incidence of squamous cell carcinoma (SCC) and basal cell carcinoma (BCC) is higher than that of breast, prostate and colon cancer combined.[4] On the other hand, melanoma, a deadliest form of skin cancer, incidence has doubled over the past 30 years.[4] Having five or more sunburns doubles the risk for melanoma and it is estimated that 200,340 cases of melanoma will be diagnosed in the U.S. in 2024.[1] Puerto Rico is not an exception and skin cancer incidence has been increasing, as reported by a multiannual incidence comparative study.[2] The study compared skin cancer incidence in

Puerto Rico in 2005 to previously reported skin cancer in 1974 and 1981. The latter found a 305% increase in incidence in 2005 compared to previous years, with 6,568 cases reported.[2] It is important to note that despite many interventions to reduce exposure to UVR, the incidence of skin cancer has been rising for decades, while many other cancers have been decreasing.[4] Among skin cancers, basal cell carcinoma is the most common, followed by squamous cell carcinoma.[1] An estimated 3.6 million and 1.8 million cases are diagnosed in the U.S. annually, respectively.[1] Melanoma is the deadliest form of skin cancer and it is estimated that the number of new melanoma cases will increase by 7.3 percent among the U.S. population1. In Puerto Rico, in 2005, a total of 6,568 new skin cancers were reported.[2] The most common type of skin cancer was basal cell carcinoma with 4,164 cases, followed by squamous cell carcinoma with 2,042 cases, keratoacanthoma with 235 cases and melanoma with 100 cases.[2]

The major modifiable risk factor for the development of non-melanoma and melanoma skin cancer is exposure to ultraviolet radiation (UV).[3] UV radiation from the sun and artificial sources predominantly comprises two wavelengths, UVA and UVB.[3] The latter is responsible for sunburn as it directly damages cellular DNA by forming pyrimidine dimers.[5] Conversely, UVA penetrates deeper into the skin and generates reactive oxygen species.[5] In brief, both UVA and UVB exposure are strongly associated with developing skin cancer by suppressing skin immunity and skin carcinogenesis.[6]

Therefore, broad-spectrum sunscreen is strongly recommended for skin cancer prevention.[6] Moreover, regular SPF 15 or higher sunscreen reduces the risk of developing squamous cell carcinoma by about 40 percent and 50 percent for melanoma when used as directed.[1] In addition to reducing skin cancer risk, consistent sunscreen use has been shown to delay signs of skin aging. A randomized, double-blind, placebo-controlled study demonstrated that after 4.5 years, individuals using daily sunscreen had 24% less skin aging compared to those using it at their discretion.[8]

Sunscreen, if correctly used along with seeking shade, wearing protective clothing, and using hats, can potentially decrease the risk of skin cancer.[5] Recommendations specified 35 ml per application of sunscreen to cover 1.73 m^2. Nevertheless, the amount of sunscreen customers use falls short of the recommended amount.[7] The American Academy of Dermatologists advised using sunscreen with an SPF of 30 or higher daily.[9] Additionally, SPFs over 30 are rarely needed unless a condition impairing immune systems or photodermatoses.[7]

Additionally, sunscreen must be applied evenly and reapplied after two hours and 15 minutes before sun exposure.[1,7] Behavioral patterns are greatly influenced by knowledge and little is known about the understanding of sunscreen used by the population.[5] Individuals with a lack of knowledge may not use sunscreen or not use it correctly.[5] Plenty of studies have investigated behavioral tendencies for sunscreen protection usage, but little is known about the population's level of knowledge about sunscreen.[5]

One study about sunscreen knowledge reported that from a total of 423 individuals in New Jersey, a majority reported sunscreen use regularly (80.6%).[5] Nevertheless, regarding sunscreen re-application, respondents had low scores.[5] Notably, 30% of participants knew that sunscreen needed to be applied every 2 hours, 32% thought that sunscreen should be applied 30 min before sun exposure and only 18% of respondents knew that approximately 1 ounce of sunscreen is required to cover the body.[5] In another study, a cross-sectional survey was conducted with 974 individuals Hispanics living in Tampa, Florida and Ponce Puerto Rico.[3] Among the participants, 29.7% reported having had a sunburn.[3] Moreover, 22.6% reported the use of sunscreen often or always.[3] In addition to this, from the questions related to distress and worry, 20.8% of participants reported recently worrying about skin cancer and about 31.8% reported being likely to get cancer.[3]

In brief this study aims to evaluate the understanding and awareness of sunscreen use within the Puerto Rican population in the metropolitan area, including knowledge of sunscreen terminology, application methods and associated risks. While the protective potential of sunscreen is well established, its real-world effectiveness depends heavily on proper use. Incorrect application timing, inadequate amounts and failure to reapply can significantly reduce its benefits. These misuse patterns are common in various populations and may contribute to rising skin cancer rates despite public awareness campaigns. By examining current sunscreen usage habits and identifying gaps in knowledge or misconceptions about sun-safe behaviors, this research intends to provide insights into skin cancer risks and inform strategies to improve sun protection practices among Puerto Ricans.

Objectives

Assess the understanding and awareness of sunscreen use among the Puerto Rican population. Identify demographic and cultural influences that may affect sunscreen knowledge and behaviors among Puerto Ricans. Determine attitudes, beliefs and perceptions regarding sunscreen use within the Puerto Rican population.

METHODS

Study design and setting

This study employed an IRB approved cross-sectional design to investigate sunscreen usage habits among adults aged 21 and above in the metropolitan area of Puerto

Rico. The study was conducted between April 2024 till August 2024. Participants completed either an online or printed survey designed to assess their knowledge and behaviors regarding sun protection.

Participants

A total of 306 participants were recruited for the study. Inclusion criteria required participants to be aged 21 and above and residing in the metropolitan area of Puerto Rico. Exclusion criteria include participants who were 20 or younger and did not reside in the metropolitan area, this being (San Juan, Bayamón, Carolina, Cataño, Guaynabo, Toa Baja and Trujillo Alto).

Participants accessed a 31-questions online survey (Appendix A) by scanning a QR code on promotional flyers (Appendix B) or completed a printed version of the survey distributed to patients of Dr. De la Torre, at the HURRA dermatology clinic. Printed surveys were manually entered into REDCap for data integration. Before completing the survey, all participants provided informed consent.

Participation was entirely voluntary and individuals were not required to provide any data that could be used to identify them. The survey aimed to comprehensively assess participants' sunscreen usage behaviors and knowledge regarding sun protection. After completing the survey, participants saw an educational flyer (Appendix C) displaying the correct answers to the questions about sunscreen knowledge. They also had the opportunity to fill out a raffle form (Appendix D) for a chance to win a gift card as a thank you for their participation.

Variables and data collection

The survey included 31 multiple-choice questions assessing the following key variables. Demographics: age, gender. Sunscreen usage behaviors: frequency of application, reapplication habits. Knowledge of sun protection: awareness of sun exposure risks, familiarity with sunscreen terms. History of skin conditions due to sun exposure. Perceptions regarding sunscreen and sun exposure: concerns about skin cancer, personal attitudes toward sunscreen use. The survey was validated using prior studies conducted in the United States to ensure reliability in assessing sunscreen-related knowledge, behaviors and perceptions.

Bias and data quality control

Several strategies were implemented to ensure data quality and minimize bias in the study. Incomplete survey responses were excluded from the analysis to maintain the integrity of the dataset. To reduce selection bias, efforts were made to increase participation by offering both printed and online survey versions to ensure accessibility. Furthermore, to mitigate recall bias, questions were structured with defined time frames (e.g., "How often did you apply sunscreen?") rather than relying on broad recall.

Study size

The target sample size was determined based on feasibility and participant accessibility rather than a formal power calculation. Given the exploratory nature of the study, a sample of 205 participants was deemed sufficient to provide meaningful insights into sunscreen habits and knowledge trends in the studied population.

While not calculated for statistical power, the sample size allows for comparisons between subgroups, particularly sex and age groups, using Chi-square and t-tests, ensuring reliable descriptive and inferential analyses.

Statistical methods

All statistical analyses were conducted using SPSS. Descriptive statistics were used to summarize the characteristics of the study population and responses to each survey question. Additionally, Chi-square and Fisher analyses were employed to investigate relationships between variables and characterize patterns and associations within the dataset. Comparisons were made by sex and age groups to identify potential differences in sunscreen usage habits, knowledge and perceptions. Statistical significance was set at $p<0.05$ for all tests.

RESULTS

A total of 306 adults were surveyed, 101 were excluded due to incomplete responses and 205 completed the questionnaire in full. Among the respondents, 26% identified as male and 74% as female. The majority of participants (56%) were aged 35 years or older. Regarding educational attainment, 42% held a bachelor's degree and 18% reported having obtained a master's degree. Most respondents (86%) identified as Hispanic.

Sunscreen usage and knowledge

With regard to sunscreen usage, 33.17% of participants reported applying sunscreen daily, regardless of outdoor activity, while 19.02% reported applying sunscreen only when expecting sun exposure. Among those who use sunscreen daily or sometimes, 21.0% reported that they do not reapply it throughout the day (Table 1).

In terms of sunscreen knowledge, 83.41% of participants recognized that sunscreen use helps prevent skin cancer and 78.0% correctly identified the recommended SPF level for adequate protection as 30 or higher. Several knowledge gaps were identified: 13.17% indicated that timing of application does not matter as long as it is applied and 50.24% reported using an arbitrary amount rather than the recommended dosage. In addition to

sunscreen use, 63.90% of participants reported engaging in other sun-protective behaviors, such as wearing sunglasses, hats or seeking shade. Regarding concern about skin cancer, 33.65% of participants reported being concerned all the time, 21.95% often, 28.78% sometimes and 15.60% rarely or never. When asked about their perceived probability of developing skin cancer, 51.21% considered it unlikely, 11.21% considered it very likely and 37.56% were uncertain.

Perceptions of sunscreen effectiveness varied: 35.60% selected 70–80% as the effectiveness range, 20.97% responded "I don't know," and 19.51% estimated 40–50%. Fewer participants selected 100% effectiveness (n=28), 20–30% (n=19) or reported no perceived effectiveness (n=2).

Comparison by sex

Both female and male participants most commonly cited family members as their primary source of sunscreen knowledge, followed by friends, schools, healthcare professionals and social media. A significantly higher proportion of female participants (29.14%) reported a family history of skin cancer compared to males (12.96%) (p=0.018). Daily sunscreen use was significantly more common among females (39.74%) than males (14.81%) (p=0.001). Similarly, females were more likely to apply sunscreen in the morning (54.30% vs. 27.78%, p=0.001). A greater proportion of male participants reported at least one sunburn compared to females (77.78% vs. 61.59%, p=0.038) and more males reported not using protective accessories such as hats, sunglasses or caps (18.52% vs. 7.95%, p=0.042).

Males were also more likely to report applying sunscreen to their ears compared to females (33.33% vs. 13.91%, p=0.002) as shown in Table 2. Females reported more frequent use of SPF≥30 products (62.96% vs 83.44%, p=0.004). Both males and females most frequently estimated sunscreen effectiveness in the 70–80% range (31.48% and 37.09%, respectively). Males more commonly selected "I don't know" (27.78% vs. 18.54%, p=0.420).

Concerns about skin cancer also differed significantly by sex (p<0.0001); 40.40% of females reported being concerned all the time, whereas 33.33% of males reported rarely or never being concerned. Perceived likelihood of developing skin cancer also varied significantly between sexes (p=0.030), with males more often rating their risk as low (66.67% vs. 45.70%) and females more often indicating uncertainty (41.72% vs. 25.93%).

Comparison by age

Both younger and older participants cited family as their primary source of sunscreen information (63.74% and 43.86%). Among younger adults, social media and friends were also common sources (16.48% each). Differences in sun exposure for tanning were statistically significant (p=0.007), with younger participants more frequently exposing themselves to the sun for tanning (14.29%) compared to older participants (9.65%). The majority of older participants (77.19%) reported avoiding sun exposure for tanning, while 57.14% of younger respondents reported doing so. Occasional sun exposure for tanning was also more common among younger adults (28.57%) than older adults (13.16%). A significantly greater proportion of younger participants reported at least one sunburn (84.62% vs. 50.88%, p<0.001). Moreover, 21.98% of younger participants reported having had four or more sunburns, in contrast to only 7.02% of older participants (Table 3).

Regarding sunscreen knowledge by age group, older adults were more likely to apply sunscreen to their arms (67.54% vs. 46.15%, p=0.002), while no significant differences were found in application to the neck, ears or scalp. Differences in reported timing of sunscreen application were also statistically significant (p=0.008). Younger participants more frequently reported that sunscreen should be applied 15 minutes before exposure (37.36% vs. 29.82%), while older participants more commonly selected 5 minutes (22.81% vs. 8.79%) or 30 minutes (10.53% vs. 24.18%).

A higher proportion of older adults believed that timing did not matter (16.67% vs. 8.79%) and uncertainty levels were similar between groups. Knowledge of sunscreen reapplication frequency significantly differed by age (p<0.001). Younger participants more frequently indicated the correct reapplication interval of every 2 hours (48.35%) compared to older adults (23.68%).

Older adults more often selected "when necessary" (20.18%) or "according to product instructions" (25.44%), whereas these responses were less common among younger adults (4.40% and 19.78%, respectively). Understanding of sunscreen dosage for full-body coverage also differed (p=0.005), with older participants more likely to apply what they considered to be a sufficient amount (57.89%) and younger participants more frequently selecting a specific measured amount.

Beliefs about sunscreen efficacy in cancer prevention also varied by age (p=0.006). Younger participants were more likely to overestimate effectiveness, with 48.35% selecting 70–80%, while 16.48% correctly identified the 40–50% range. Among older adults, 21.93% correctly selected 40–50% and 25.44% selected 70–80%. A higher proportion of older participants selected 100% (19.30%) compared to younger respondents (6.59%). Uncertainty regarding sunscreen effectiveness was higher among older adults (23.68% vs. 17.58%). Concern about skin cancer differed significantly between age groups (p=0.006). Older participants were more likely to report being concerned all the time (43.86%), while younger participants were more likely to report being rarely or never concerned (19.78%).

Table 1: Sunscreen usage and knowledge among adult participants in Puerto Rico.

Variable	N (%)
Applies sunscreen daily, regardless of outdoor activity	68 (33.2)
Applies sunscreen only when expecting sun exposure	39 (19.0)
Uses additional sun-protective behaviors (hats, sunglasses, shade)	131 (63.9)
Knows that sunscreen helps prevent skin cancer	171 (83.4)
Correctly identified SPF 30 or higher as the recommended	160 (78.0)
Do not reapply sunscreen	43 (21.0)
Believes application timing does not matter	27 (13.2)
Applies what they consider a sufficient amount (not measured)	103 (50.2)
Concerned about skin cancer 'all the time'	69 (33.7)
Perceives own risk of developing skin cancer as 'very likely'	23 (11.2)
Perceives sunscreen effectiveness to be 70–80%	73 (35.6)
Does not know how effective sunscreen is	43 (21.0)

Note: SPF=sun protection factor. Percentages are calculated from the total number of valid responses (n=205)

Table 2: Sunscreen knowledge and behaviours by sex in Puerto Rico.

Variable	Male (n=54)	Female (n=151)	P value
Applies sunscreen daily	14.81%	39.74%	0.001
Applies sunscreen in the morning	27.78%	54.30%	0.001
History of sunburn	77.78%	61.59%	0.038
Does not use protective accessories (hat, sunglasses, cap)	18.52%	7.95%	0.042
Correctly identified SPF 30 or higher as the recommended	62.96	83.44	0.004
Believes sunscreen is 70–80% effective	31.48%	37.09%	0.420
Does not know sunscreen effectiveness	27.78%	18.54%	0.420
Concerned about skin cancer 'all the time'	14.81%	40.40%	<0.0001
Perceives risk of skin cancer as 'unlikely'	66.67%	45.70%	0.030
Perceives risk of skin cancer as 'uncertain'	25.93%	41.72%	0.030

Note: SPF=sun protection factor. Percentages are calculated from the total number of valid responses (n=205). P values were calculated with the Pearson Chi-square unless otherwise stated, *Fisher's exact test.

Table 3: Sunscreen knowledge and behaviors by age group.

Variable	21–34 years (n=91)	35+ years (n=114)	P value
Exposes skin to sun intentionally for tanning	14.29%	9.65%	0.007
Avoids sun exposure for tanning	57.14%	77.19%	0.007
Occasionally exposes to sun for tanning	28.57%	13.16%	0.007
History of sunburn	84.62%	50.88%	<0.001*
Reported ≥4 lifetime sunburns	21.98%	7.02%	<0.001
Correctly knows sunscreen needs to be reapplied every 2 hours	48.35%	23.68%	<0.001*
Applies what they believe is sufficient (not measured)	40.66%	57.89%	0.005*
Believes sunscreen is 70–80% effective	48.35%	25.44%	0.006*
Believes sunscreen is 100% effective	6.59%	19.30%	0.006*
Concerned about skin cancer 'all the time'	20.88%	43.86%	0.006

Note: SPF=sun protection factor. Percentages are calculated from the total number of valid responses (n=205). P values were calculated with the Pearson Chi-square unless otherwise stated, *Fisher's exact test.

DISCUSSION

This study assessed sunscreen usage habits and knowledge among adults in the metropolitan area of Puerto Rico, with a focus on identifying gaps in awareness, behaviors and perceptions related to skin cancer prevention. The findings provide insight into sun protection practices, including both proper and suboptimal behaviors, as well as demographic differences that may inform future educational interventions. Despite high general awareness about the role of sunscreen in preventing skin cancer (83.4%), only 33.2% of participants applied sunscreen daily. Among those who use sunscreen, 21.0% reported that they do not reapply it

throughout the day and 50.2% indicated using an arbitrary amount rather than the recommended dosage. Additionally, 13.2% stated that the timing of application did not matter as long as it was applied.

When analyzed by sex, significant differences emerged. Females reported higher daily sunscreen use (39.74% vs. 14.81%, p=0.001), greater morning application and more frequent use of SPF≥30 products (62.96% vs 83.44%, p=0.004). Conversely, males were significantly more likely to apply sunscreen to the ears (p=0.002) but also more likely to report no use of protective accessories (p=0.042). Concern about skin cancer was notably higher among females, while males more frequently perceived their risk as low (p=0.030). Age-based comparisons revealed that younger adults (21–34 years) had significantly higher rates of sunburn (84.6% vs. 50.9%, p<0.001) and were more likely to engage in tanning behaviors. However, they were also more likely to correctly report sunscreen reapplication every two hours (p<0.001). Older adults, while more cautious about sun exposure, were more likely to overestimate sunscreen's protective capacity, with 19.3% believing it to be 100% effective.

Several limitations must be considered when interpreting these findings. First, recall bias may have influenced participants' self-reported data, particularly regarding sunscreen usage, reapplication frequency and past sunburns. Second, the cross-sectional design limits the ability to infer causality or observe changes in behavior or knowledge over time. Additionally, the study's geographic scope was restricted to the metropolitan area of Puerto Rico, which may not reflect sun protection behaviors in rural or coastal regions of the island or among other Hispanic populations outside of Puerto Rico. The overrepresentation of women (74%) in the sample may also limit the applicability of sex-based comparisons.

Another limitation is the reliance on self-reported medical history, particularly regarding past diagnoses of skin cancer, which were not confirmed clinically and could introduce misclassification. The survey also did not assess whether participants had received formal education on sun protection, a factor that could influence both knowledge and behavior. Furthermore, interpretation bias could arise from ambiguous wording in some items (e.g., sunscreen application timing), potentially leading to inconsistent understanding among respondents.

Interpretation

The findings of this study underscore a disconnect between general awareness of sunscreen's benefits and the proper execution of sun-protective behaviors. While most participants understood that sunscreen helps prevent skin cancer, few demonstrated comprehensive knowledge of application timing, reapplication frequency or recommended SPF levels. The gender and age differences observed further emphasize the need for tailored interventions: educational messaging aimed at younger individuals should address high-risk behaviors like tanning and frequent sunburns, while efforts directed toward older adults might focus on correcting overconfidence in sunscreen efficacy and reinforcing correct dosage and application routines. These findings are consistent with prior literature, including studies in Hispanic populations in Florida and Puerto Rico, which found suboptimal sunscreen use and low levels of knowledge about reapplication and timing. For example, previous work by Charles et al found that only 22.6% of Hispanic participants used sunscreen frequently, similar to the 33% in our cohort. Additionally, the common misconception that sunscreen is highly protective (70–100%) reinforces the need for targeted education on its actual efficacy range (40–50%).

Generalizability

Although the study population was limited to the metropolitan area, the findings offer valuable insight into sun protection practices within a predominantly Hispanic urban population. Given that skin cancer prevention programs often overlook minority communities, these results have broader relevance for public health efforts in other Hispanic-majority regions. However, caution should be exercised in generalizing to rural or non-Hispanic populations, where sun exposure patterns, access to dermatological care and cultural attitudes may differ.

CONCLUSION

Overall, this study reveals that while general awareness of sunscreen's protective role is high among adults in Puerto Rico, significant gaps remain in proper usage, particularly related to application timing, reapplication frequency and dosage. Notably, females and participants with a family history of skin cancer were more likely to engage in consistent sun protection behaviors, suggesting that perceived risk influences preventive practices. Meanwhile, varying levels of concern and misperceptions about sunscreen effectiveness highlight the need for targeted education. By identifying demographic patterns and behavioral gaps, this study contributes to a better understanding of sun protection habits in Hispanic urban populations and underscores the urgency of culturally tailored public health initiatives to reduce skin cancer risk.

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REFERENCES

1. Harrison K. The accuracy of skin cancer detection rates with the implementation of dermoscopy among

dermatology clinicians: a scoping review. J Clin Aesth Dermatol. 2024;17(1):18.
2. De La Torre-Lugo EM, Figueroa LD, Sánchez JL, Morales-Burgos A, Conde D. Skin cancer in Puerto Rico: a multiannual incidence comparative study. P R Health Sci J. 2010;29(3):312–6.
3. Charles J, Soto-Torres B, Sutton SK, Doyle SH, Kim Y, Roetzheim RG, et al. Skin cancer prevention behaviors, beliefs, distress and worry among Hispanics in Florida and Puerto Rico. BMC Public Health. 2023;23(1):587.
4. Vasicek B, Szpunar S, Manz-Dulac L. Patient knowledge of FDA-mandated sunscreen labeling terminology: A cross-sectional survey. J Am Acad Dermatol. 2019;81(4):100.
5. Wang SQ, Dusza SW. Assessment of sunscreen knowledge: a pilot survey. Br J Dermatol. 2009;161(3):28–32.
6. Green AC, Williams GM. Point: Sunscreen use is a safe and effective approach to skin cancer prevention. Cancer Epidemiol Biomarkers Prev. 2007;16(10):1921–2.
7. Moloney FJ, Collins S, Murphy GM. Sunscreens. Am J Clin Dermatol. 2002;3(3):185–91.
8. Hughes MC, Williams GM, Baker P, Green AC. Sunscreen and prevention of skin aging: a randomized trial. Ann Intern Med. 2013;158(11):781–90.
9. American Academy of Dermatology. Sunscreen FAQs and statistics. Available at: https://www.aad.org/media/stats-sunscreen. Accessed on 10 April 2025.

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