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## Sun Protection Practices and Knowledge Levels Among Medical Students in Türkiye: A Cross-Sectional Analysis

Türkiye’de Tıp Fakültesi Öğrencileri Arasında Güneşten Korunma Uygulamaları ve Bilgi Düzeyleri: Kesitsel Bir Analiz

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**Objective:** Ultraviolet radiation is a major risk factor for various dermatological issues, including skin cancer and photoaging. Sunscreen use is a primary protective measure, but adherence and knowledge levels are inconsistent, even among medical students. This study aimed to assess the sun protection habits and knowledge levels of medical students in Türkiye.

**Materials and Methods:** A cross-sectional survey was conducted between April and May 2025 among 244 medical students from various universities in Türkiye. An online questionnaire consisting of 22 items was used to collect data on demographics, sunscreen use behaviors, and knowledge levels.

**Results:** Of the respondents, 85.2% reported regular sunscreen use, with significantly higher rates among females (96.4%) compared to males (62%) ( $p<0.001$ ). The most preferred SPF level was 50+ (53.2%), and cream formulations were favored by 86.5%. Application typically occurred 15–30 minutes before sun exposure (61.2%), though reapplication practices were poor, with only 11.7% consistently reapplying. While 85.7% believed in sunscreen's protective benefits, 32.4% rated their knowledge as inadequate. The most frequently protected area was the face (77.6%)

**Conclusion:** Medical students in Türkiye display high levels of sunscreen use compared to the general population, though gaps remain in proper application and reapplication practices. Targeted educational interventions in medical curricula could enhance both personal sun safety behaviors and the delivery of public health messages.

**Keywords:** Sunscreen, sun protection, medical students, UV exposure, knowledge

**Amaç:** Ultraviyole (UV) radyasyonu, cilt kanseri ve foto yaşlanma gibi dermatolojik sorunlar için temel risk faktörüdür. Güneş kremi kullanımı, bu zararları önlemek için başlıca koruyucu yöntemdir. Ancak, kullanım alışkanlıkları ve bilgi düzeyi bireyler arasında farklılık göstermektedir. Bu çalışma, Türkiye’deki tıp fakültesi öğrencilerinin güneşten korunma alışkanlıkları ve bilgi düzeylerini değerlendirmeyi amaçlamaktadır.

**Gereç ve Yöntem:** Nisan-Mayıs 2025 tarihleri arasında, Türkiye genelindeki üniversitelerden 244 tıp fakültesi öğrencisinin katılımıyla çevrim içi anket yöntemiyle kesitsel bir çalışma gerçekleştirilmiştir. Anket, demografik özellikler, güneş kremi kullanım alışkanlıkları ve bilgi düzeyini değerlendiren 22 sorudan oluşmaktadır.

**Bulgular:** Katılımcıların %85,2’si düzenli olarak güneş kremi kullandığını bildirmiştir; kadınlarda oran (%96,4) erkeklerden (%62) anlamlı derecede yüksektir ( $p<0,001$ ). En sık tercih edilen SPF düzeyi 50+ (%53,2) olup, %86,5 krem formunu tercih etmiştir. Uygulama çoğunlukla güneşe çıkmadan 15-30 dakika önce yapılmıştır (%61,2); ancak yalnızca %11,7’si düzenli tekrar uygulama yapmaktadır. Katılımcıların %85,7’si koruyucu faydalara inansa da, %32,4’ü bilgi düzeyini yetersiz bulmuştur. Yüz, en sık korunan bölge olarak bildirilmiştir (%77,6).

**Sonuç:** Tıp fakültesi öğrencileri yüksek güneş kremi kullanım oranına sahiptir. Ancak, uygulama teknikleri ve bilgi düzeyi açısından eksiklikler bulunmaktadır. Müfredatlara eklenecek eğitim programları, kişisel ve toplumsal koruyucu davranışların gelişmesine katkı sağlayabilir.

**Anahtar Kelimeler:** Güneş kremi, güneşten korunma, tıp öğrencileri, UV maruziyeti, bilgi düzeyi

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## INTRODUCTION

Sunlight plays a vital role in sustaining life, yet excessive exposure to ultraviolet (UV) radiation is a well-established risk factor for a range of dermatological issues, including actinic keratosis, premature skin aging, hyperpigmentation, and various forms of skin cancer such as melanoma. Among the most effective strategies for mitigating these harmful effects is the regular and proper use of sunscreen. However, adherence to sun protection practices is closely tied to individual knowledge and habitual behaviors, particularly in younger populations. Establishing these protective behaviors early is crucial for maintaining long-term skin health (Narayanan et al., 2010). Sunscreens act as a barrier against both UV-A and UV-B rays, and their consistent application has been shown to significantly reduce the risk of skin cancer while slowing the onset of photoaging. Despite their proven efficacy, levels of public awareness and adherence to sunscreen use vary widely. Even among medical students who are expected to possess a higher level of health literacy and serve as public health role models, such behaviors are not uniform (Isvy et al., 2013). This study aimed to investigate the sun protection habits and knowledge levels of medical students. As future healthcare providers, their understanding of sunscreen use and sun safety is essential, not only for personal health but also for disseminating accurate and effective public health messages.

## MATERIALS AND METHODS

This cross-sectional survey was conducted between April 25, 2025 and May 10, 2025, targeting medical students across various universities in Türkiye. Participation was voluntary, and informed consent was obtained from all respondents. An online survey distributed via Google Forms (**Table 1**) and covering demographic data (age, gender, university), family history of skin cancer, sunscreen usage behaviors, and self-perceived knowledge levels regarding sun protection was employed. Respondents who reported sunscreen use were prompted to provide further details, while non-users completed the survey at

that point. The survey explored frequency of sunscreen use, sun protection factor (SPF) preferences, areas and timing of application, reapplication habits, preferred formulations, and sources of sunscreen purchase. Descriptive and inferential statistics were used to analyze the collected data. The study received ethical approval from the Non-Interventional Research Ethics Committee of Balıkesir University Faculty of Health Sciences. (Decision No: 2025/163).

**Table 1.** Questions of online survey distributed via Google forms

	Question Text	Answer Options
1	Do you use sunscreen?	Yes / No
2	How often do you use sunscreen?	Every day / Only during summer / Rarely / Only on sunny days
3	What SPF level do you prefer?	SPF 15 / SPF 30 / SPF 50 / SPF 50+
4	Which areas do you usually apply sunscreen to?	Face / Limbs / Whole body
5	How often do you re-apply sunscreen?	Every 2 hours / Every 4-5 hours / Once a day / Before sun exposure / When I feel that I need
6	What form of sunscreen do you prefer?	Spray / Cream / Lotion / Gel
7	Do you sometimes forget to reapply sunscreen?	Yes / No / Sometimes
8	What is your skin type?	Dry / Oily / Sensitive / Combination
9	Do you believe sunscreen has an impact on your skin health?	Yes / No / Not sure
10	At what age did you start using sunscreen?	0-10 / 11-20 / 21-30 / Over 30
11	Do you think you have enough knowledge about sunscreen use?	Yes / No / Partially
12	Where do you usually buy your sunscreen?	Pharmacy / Cosmetic store / Online / Supermarket
13	How long before going out in the sun do you apply sunscreen?	15-30 minutes before / Just before going out / I don't pay attention
14	What is your main reason for using sunscreen?	Health / Social media influence / Cosmetic

## Statistical Analysis and Ethical Aspects

Descriptive statistics were presented as number (percentage). Categorical comparisons were

performed employing Chi-square test. Analyses were performed under SPSS 30.0 software for MacOs (SPSS Inc., Chicago, IL). A p value less than 0.05 was considered statistically significant.

## RESULTS

A total of 244 medical students participated, of whom 165 (67.6%) were female and 79 (32.4%) were male. A large proportion of the participants, 208 (85.2%) reported regular use of sunscreen Preferred SPF levels were predominantly 50+ (53.2%) and 50 (34.4%), with 30 SPF chosen by 12.4%. The main reason cited for sunscreen use was protection of skin health (83.9%), followed by cosmetic reasons (13%) and social media influence (2.7%).

Regarding frequency of use, 45.2% used sunscreen daily, 23.5% used it only during summer months, 16.7% applied it only on sunny days, and 14% used it infrequently (Table 2). Application timing revealed that 61.2% applied sunscreen 15–30 minutes before sun exposure, 24.1% immediately before exposure, and 9.4% without paying attention to timing.

Participants reported daily sun exposure durations as follows: 35.7% for 2–3 hours, 32.6% for 1–2 hours, 15.4% for 3–4 hours, 6.2% for over 4 hours, and 10.1% for less than one hour.

The most common skin type reported was combination skin (54.9%), followed by oily (16.8%), dry (15%), and sensitive (13.3%). The face was the most frequently protected area (77.6%). Cream formulations were preferred by 86.5% of respondents, with sprays (8.5%), lotions (4%), and gels (0.9%) being less popular. Reapplication practices were suboptimal: 66.2% reported often forgetting, 22.1% sometimes forgot, and only 11.7% consistently reapplied sunscreen.

Most participants (68.6%) began using sunscreen between the ages of 11–20, while 17.5% started before the age of 10. A majority (85.7%) believed in the protective benefits of sunscreen, although 32.4% described

themselves as "not knowledgeable," 28% as "adequately knowledgeable," and 11.6% as "somewhat knowledgeable." Regarding purchasing habits, 36.8% obtained sunscreen online, 32.7% from cosmetic stores, 26.5% from pharmacies, and 4% from supermarkets (Table 3). Female students demonstrated higher rates of sunscreen use (96.4%) compared to male students (62%), a difference that was statistically significant ( $p < 0.001$ ,  $\chi^2 = 50.08$ ). Female participants also showed a greater preference for SPF 50 or higher (92.7% vs. 81%,  $p = 0.006$ ,  $\chi^2 = 7.45$ ) (Table 4).

**Table 2.** Distribution of sunscreen usage frequency among students

How frequently do you apply or use sunscreen products?	
Everyday	45.2%
Only during summer months	23.5%
Sunny days	16.7%
Infrequently	14%

**Table 3.** Distribution of purchasing habits of the students

What is your usual source for selecting sunscreen products?	
Online	36.8%
Cosmetic stores	32.7%
Pharmacies	26.5%
Supermarkets	4%

## DISCUSSION

Our findings reveal that the majority of medical students surveyed exhibit proactive sun protection behaviors, with a sunscreen usage

**Table 4.** Comparisons between female and male students

	Sunscreen usage frequency	SPF 50 preference
Female	96.4%	92.7%
Male	62%	81%
P value	<0.001	0.006
$\chi^2$ value	50.08	7.45

rate of 85.2%. This is markedly higher than the rates observed in the general population. For instance, Holman et al. reported that only 42.6% of women and 18.1% of men in the U.S.

consistently used sunscreen on their faces (Holman et al., 2015). This suggests that medical education may have a positive influence on health behaviors.

Consistent with prior research, such as Ivanov et al., which highlighted a gender gap in sun protection behaviors among osteopathic medical students (Ivanov et al., 2018), our study also found a significantly higher rate of sunscreen use among female participants ( $p < 0.001$ ). This may reflect gender differences in health awareness and cosmetic preferences (Abroms et al., 2003). However, the report by Ivanov et al. focused exclusively on first-year students, whereas ours included students from all years, potentially accounting for the higher overall usage rate.

The tendency to apply sunscreen 15–30 minutes before sun exposure (61.2%) aligns with American Academy of Dermatology (AAD) guidelines (Association, 2025). However, 24.1% who applied it immediately before sun exposure and the low rate of consistent reapplication (11.7%) highlight areas for improvement. Educational interventions emphasizing proper sunscreen use and the importance of reapplication may be warranted. While a majority (65.2%) reported initiating sunscreen use between ages 11–20, this leaves room for earlier adoption. The American Academy of Pediatrics emphasizes that establishing sun protection habits in childhood is essential for reducing the long-term risk of skin cancer (Balk, 2011).

Overall, although medical students generally demonstrate a commendable level of sun protection, gaps remain in reapplication practices and comprehensive knowledge. Strengthening sun safety education within medical curricula could enhance both personal health outcomes and the quality of future public health messaging.

## CONCLUSION

This study demonstrates that medical students in Türkiye exhibit a generally high level of sunscreen use and awareness regarding sun protection, significantly surpassing rates reported in the general population. Nonetheless,

notable gaps persist, particularly in the areas of proper reapplication practices and comprehensive sun safety knowledge. These findings underscore the importance of integrating targeted educational interventions into medical curricula, aimed at fostering not only personal sun protection habits but also the capacity to effectively communicate sun safety messages to the wider public. By equipping future healthcare providers,

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**Conflict of interest:** The authors have no conflicts of interest to declare.

**Ethics approval and consent to participate:** The study received ethical approval from the Non-Interventional Research Ethics Committee of Balıkesir University Faculty of Health Sciences. (Decision No: 2025/163).

The study was conducted in line with the principles of the "Helsinki Declaration."

**Availability of Data and Materials:** This study was conducted within the scope of the Scientific Literacy course for Term 5 students of Balıkesir University, Faculty of Medicine and was presented as a poster at the Balıkesir University Science Fair. The datasets from the current study can be obtained on request from the corresponding author.

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