

# Evaluation of the Knowledge of Sun Damage, Solar Protection and Skin Cancers among University Students and Their Parents

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## ABSTRACT

**Purpose:** Awareness of the harmful effects of the sun, follow up of nevi, and the knowledge of solar protection are important for the prevention and early diagnosis of skin cancers. Our aim is to evaluate the knowledge of university students and their parents about the harmful effects of the sun, and associated skin cancers.

**Methods:** 653 university students and 615 parents participated in our cross-sectional study. The survey was delivered via the SurveyMonkey application link and demographic data was recorded. Fitzpatrick skin types, natural hair and eye colors, and personal, and family skin cancer history were questioned. Information on the harmful effects of the sun, nevus examination, self-skin examination, symptoms of skin cancers, and facilitating factors were questioned.

**Results:** 1004 of the participants were women, 264 were men. Fitzpatrick II skin type and brown eyes were the most common in both groups. The nevi follow-up and self-examination habits did not differ statistically between the groups. Nevi follow-up was regarded as essential and requiring a dermatologist. Participants believed that the most common skin cancer was malignant melanoma.

**Conclusion:** It is important to raise awareness about skin cancers, to follow up nevi and to introduce the habit of self-examination into society in general.

**Keywords:** Dermatologist, Melanoma, Nevus, Preventive Medicine

## Güneş Koruma ve Deri Kanselerine Dair Farkındalığının Üniversite Öğrencileri ve Ebeveynlerinde Değerlendirilmesi

### ÖZET

**Amaç:** Güneşin zararlı etkileri ve fotokorunmaya dair bilgi ile nevüs takibinin gerekliliğine dair farkındalık, deri kanserlerinden korunma ve erken teşhis için önemlidir. Amacımız, üniversite öğrencilerinin ve velilerinin güneşin zararlı etkileri ve deri kanserleri hakkındaki bilgilerinin değerlendirilmesidir.

**Yöntem:** Kesitsel çalışmamıza 653 üniversite öğrencisi ve 615 veli katıldı. Anket, SurveyMonkey uygulama bağlantısı üzerinden katılımcılara iletildi. Fitzpatrick deri tipleri, doğal saç ve göz renkleri, kişisel ve aile cilt kanseri öyküsü sorgulandı. Katılımcıların güneşin zararlı etkileri, nevüs muayenesi, kendi kendine deri muayenesi, deri kanserlerinin belirtileri ve kolaylaştırıcı faktörler hakkındaki bilgileri değerlendirildi.

**Bulgular:** Katılımcıların 1004'ü kadın, 264'ü erkekti. Her iki grupta da en yaygın Fitzpatrick II deri tipi ve kahverengi göz saptandı. Gruplar arasında nevüs takibi ve kendi kendine ben muayenesi alışkanlıkları istatistiksel olarak farklılık göstermedi. Nevüs takibinin gerekli olduğu ve dermatolog tarafından yapılması gerektiği bildirildi. Katılımcılar en yaygın deri kanserinin malign melanom olduğunu bildirdi.

**Sonuç:** Deri kanserleri konusunda farkındalık yaratmak, nevüs takibinin öneminin altını çizmek ve topluma kendi kendine deri muayenesi alışkanlığı kazandırmak oldukça önemlidir.

**Anahtar kelimeler:** Dermatolog, Koruyucu Hekimlik, Melanom, Nevüs

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Ultraviolet rays have harmful effects on human skin. These rays can cause sunburns, skin cancers and aging. Accordingly, intense overexposure to sunlight causes acute sunburn leading to an erythematous skin rash, while chronic exposure leads to both photoaging of the skin and an increased risk of melanoma and non-melanoma skin cancers (1).

Keratinocyte-derived skin cancers are the most common type, but the most lethal skin cancer is malignant melanoma. The facilitating effects of sunlight on the formation of malignant melanoma and keratinocyte-derived squamous cell carcinoma (SCC) and basal cell carcinoma (BCC) are widely known. In addition, the harmful effects of the sun are not only limited to the skin but can cause some damage and diseases in the eyes such as photoconjunctivitis, cataracts and retinal degeneration. Sun rays can also cause uveal/conjunctival melanoma (2).

It has been reported that the incidence of malignant melanoma in the USA has increased by 270% in the last 30 years due to increased life expectancy and UV exposure. It is known that exposure to both natural (sunlight) or artificial UV rays such as tanning beds (solariums) may play a role in the development of melanoma. In addition, iatrogenic exposure may be given with phototherapy. All are known to increase other skin cancers such as BCC and SCC, but this association is stronger in melanoma (3). Apart from the parameters mentioned above, it should be kept in mind that some inalterable phenotypic risk factors such as light skin and eye color are also risk factors for melanoma (4). Being aware of the harmful effects of the sun and following protective behaviors in society may be important in determining future goals and creating a stronger public awareness of this issue (5).

Preventive medicine practice against skin cancers is essential and its popularity is increasing every day. In this regard, it is very important for individuals to know their own skin type and the risks associated with it, to be aware of the risk of familial skin cancer, and to be conscious of protection methods from UV rays (UVR). In addition, it should be known in society that moles on the skin and in areas such as the mouth and genital area may lead to skin cancers and should be strictly followed by a dermatologist. Therefore, the aim of this study is to compare sun awareness between university students and their parents.

## MATERIALS AND METHOD

The study was planned as a cross-sectional, online survey study. Istanbul Kent University students and their parents were included in the study. In total, 653 students and 615

parents voluntarily participated in the online survey for the study. The survey was delivered to the participants via SurveyMonkey application link. Permission was obtained before starting the online survey questions, and viewing the other questions was not allowed unless the consent page was accepted.

The age and gender information of the participants who gave consent was recorded and the educational status of the participating parents was questioned. In the survey, totally 39 questions were asked to each participant about solar damage, sun protection methods and skin cancer. Personal and familial history of skin cancer of both students and parents were recorded. In the next step, to determine the skin phototypes, the question "which describes you best?" was asked and the person was asked to mark the answer that best suited them. According to the answers given, the Fitzpatrick skin type of the participants was determined, and no physician evaluation was made. Whether or not all participants were sensitive to the sun was recorded with yes/no questions. In the next step, questions evaluating the knowledge of solar damage, and skin cancer were asked, and sun protection attitudes were assessed.

## RESULTS

### Demographic Data

1004 of the participants were female (79.2%), 264 were male (20.8%), and the median age was 37 years (min-max: 18-60). While 65.9% of the parents were university graduates, 20% held associate degrees, 8.3% were high school, 3.1% were secondary school, and 2.8% were primary school graduates (Table 1).

Of the parents, 133 were Fitzpatrick type I, 242 were type II, 87 were type III and 153 were type IV (21.6%, 39.3%, 14.1% and 24.9%, respectively). Among university students, 170 were Fitzpatrick type I, 260 were type II, 73 were type III and 150 were type IV (26.0%, 39.8%, 11.2% and 23.90%, respectively).

The distribution of eye color did not differ significantly ( $p > 0.05$ ) between the groups. The distribution of natural hair and eye color in the two groups did not differ significantly ( $p > 0.05$ ), and the rates of having brown eye color and dark brown hair were higher in both groups.

The rate of personal and family history of skin cancer did not differ significantly between the groups ( $p > 0.05$  for both).

**Table 1. Age, gender, and educational status**

		Min-Max	Median	Mean.sd±/n-%	
<b>Age</b>		18.0-60.0	37.0	36.2±11.9	
<b>Gender</b>	Female			1004	79.2%
	Male			264	20.8%
<b>Education</b>	Primary			17	2.8%
	Middle			19	3.1%
	High School			51	8.3%
	Associate degree			123	20.0%
	University			405	65.9%

The rate of sun sensitivity and sun protection habit with hats did not differ significantly between the groups ( $p > 0.05$ ). There was no significant difference in the preference of sitting in open areas and choosing shade areas in the university student and parent groups ( $p > 0.05$ ). The rate of consulting a pharmacist or social media about sunscreen products did not differ significantly ( $p > 0.05$ ) between the groups. The rate of consulting a family physician or social acquaintances about the choice of sunscreen products in the parent group was significantly higher ( $p < 0.05$ ) than the student group. In the student group, the rate of consulting a dermatologist about sunscreen products was found to be significantly higher ( $p < 0.05$ ) compared to the parents (Table 2).

There was no significant difference ( $p > 0.05$ ) between the groups on the knowledge about the time when the sun is strongest and whether the damage caused by the sun can be repaired. Similarly, there was no significant difference between the groups in response distributions regarding which clothes offer greater protection from UV rays and in which environments there is a risk of sunburn ( $p > 0.05$ ).

There was no significant difference ( $p > 0.05$ ) between the groups in determining the angle of sun rays according to the length of shade. There was no significant difference ( $p > 0.05$ ) between the groups in the knowledge of whether sunbathing during the summer vacations for a few days a year would increase the risk of skin cancer.

*Monitoring of Nevi and Evaluation of Awareness about Skin Cancer*

The rates of identifying regular nevi follow-up as necessary and self-examination habits did not differ significantly between the groups ( $p > 0.05$ ). Opinions about which physician should follow up the moles on the body did not differ significantly between the groups ( $p > 0.05$ ), and the requirement for dermatologist follow-up was answered correctly at a high rate (students: 82.4% and parents: 77.6%) (Table 3).

**Table 2. Getting information about sun protection preferences and sunscreen products**

	Student		Parent		p	
	n	%	n	%		
<b>Do you have sun sensitivity?</b>						
Yes	310	47.5%	262	42.6%	0.081	$\chi^2$
No	343	52.5%	353	57.4%		
<b>Do you have a habit of protecting yourself from the sun with a hat?</b>						
Yes	336	51.5%	344	55.9%	0.110	$\chi^2$
No	317	48.5%	271	44.1%		
<b>Would you prefer to sit in shade when sitting outside?</b>						
Yes	594	91.0%	555	90.2%	0.660	$\chi^2$
No	59	9.0%	60	9.8%		
<b>Who do you consult about sunscreen products?</b>						
Pharmacist	182	27.9%	174	28.3%	0.916	$\chi^2$
Family Physician	46	7.0%	99	16.1%	<b>0.000</b>	$\chi^2$
Dermatologist	289	44.3%	177	28.8%	<b>0.000</b>	$\chi^2$
Social Media/YouTube	62	9.5%	62	10.1%	0.797	$\chi^2$
Social Acquaintances	74	11.3%	103	16.7%	<b>0.007</b>	$\chi^2$
$\chi^2$ Chi-square test						

Table 3. Evaluation of awareness about moles follow-up on the body						
	Student		Parent		p	
	n	%	n	%		
<b>Is it necessary to follow-up the moles?</b>						
Yes	598	91.6%	545	88.6%	0.077	χ <sup>2</sup>
No	55	8.4%	70	11.4%		
<b>Do you have the habit of skin self-examination?</b>						
Yes	242	37.1%	240	39.0%	0.471	χ <sup>2</sup>
No	411	62.9%	375	61.0%		
<b>Which specialist follows-up the moles on the body?</b>						
Family physician	30	4.6%	25	4.1%	0.064	χ <sup>2</sup>
Internal specialist	50	7.7%	71	11.5%		χ <sup>2</sup>
General surgeon	35	5.4%	42	6.8%		χ <sup>2</sup>
Dermatologist	538	82.4%	477	77.6%		χ <sup>2</sup>
X <sup>2</sup> Chi-square test						

*Evaluation of Awareness about Moles Follow-up on the Body*

There was no significant difference ( $p > 0.05$ ) within the groups regarding the opinions that “dark-skinned people will never have skin cancer” and “excessive exposure to the sun is the only way for a person to get skin cancer” ( $p > 0.05$  for both). When the most common skin cancer was questioned in both groups, there was no statistical difference between the answers given and the most common answer was “melanoma” ( $p > 0.05$ ). There was no significant difference in knowledge level between the groups in terms of symptoms of skin cancer ( $p > 0.05$ ).

*Evaluation of Sun Protection Measures*

The response rate to the question of whether the habit of using sunglasses is essential or necessary for protection against UV rays of the sun did not differ significantly ( $p > 0.05$ ) between the groups. Knowledge of the presence of sunscreen and UV filtered clothing did not differ significantly between the groups ( $p > 0.05$ ).

There was no significant difference between the groups in the response rates on whether tanning with a solarium is safe ( $p > 0.05$ ). The answers given to the statements “it is possible to tan without any negative effects when sunscreen cream/spray is applied” and “tanning protects my skin against the harmful effects of sun” did not differ significantly between the two groups ( $p > 0.05$  for both).

Among the questions given in Table 4, only the opinion on whether gradual tanning removes the harmful effects of the sun was statistically significant between the groups. The awareness rate of this proposition, which is known to be false, was found to be higher in university students compared to parents ( $p=0.012$ ).

It was determined that the knowledge and attitudes regarding the correct timing of sunscreen use were not statistically significant between the groups, and the accuracy rates were high in both groups ( $p > 0.05$ ) (Table 5).

Participants have knowledge that both having a severe sunburn and having a family history of skin cancer increase the risk of skin cancer. However, the knowledge that having both sunburn and a family history of skin cancer increase the risk separately was found to be statistically higher in the student group compared to the parents. Alterations in the existing nevi and non-healing wounds, which are symptoms of skin cancer, are concepts that are well known in both groups, and no statistical difference was observed (Table 6).

Table 4. Information on Artificial Tanning Beds						
	Student		Parent		p	
	n	%	n	%		
<b>Tanning beds are safe to get a tan</b>						
True	62	9.5%	62	10.1%	0.725	$\chi^2$
False	591	90.5%	553	89.9%		
<b>It is possible to get a tan without any negative effects when using sunscreen cream/spray</b>						
True	281	43.0%	286	46.5%	0.214	$\chi^2$
False	372	57.0%	329	53.5%		
<b>Tanning protects my skin against the sun</b>						
True	203	31.1%	187	30.4%	0.793	$\chi^2$
False	450	68.9%	428	69.6%		
<b>Bronzing sprays provide no sun protection</b>						
True	287	44.0%	250	40.7%	0.235	$\chi^2$
False	366	56.0%	365	59.3%		
<b>Tanning with tanning beds (solariums) in winter protects the skin against sun damage in summer</b>						
True	125	19.1%	140	22.8%	0.113	$\chi^2$
False	528	80.9%	475	77.2%		
<b>Gradual tanning eliminates most of the negative effects of prolonged sun exposure</b>						
True	494	75.7%	501	81.5%	<b>0.012</b>	$\chi^2$
False	159	24.3%	114	18.5%		
<b>Tanning is a sign of skin damage</b>						
True	248	38.0%	233	37.9%	0.973	$\chi^2$
False	405	62.0%	382	62.1%		
<b>UVR from tanning beds are safer than UVR from the sunlight</b>						
True	134	20.5%	122	19.8%	0.762	$\chi^2$
False	519	79.5%	493	80.2%		
<b>Tanning is an unsafe way to get the vitamin D that your body needs</b>						
True	355	54.4%	311	50.6%	0.176	$\chi^2$
False	298	45.6%	304	49.4%		
<b>Tanning is a sign of physical health</b>						
True	251	38.4%	232	37.7%	0.793	$\chi^2$
False	402	61.6%	383	62.3%		
<b>If you don't usually get sun exposure, getting two or three severe sunburns in your life probably won't increase your chances of skin cancer</b>						
True	276	42.3%	234	38.0%	0.126	$\chi^2$
False	377	57.7%	381	62.0%		
$\chi^2$ Chi-square test						

Table 5. Evaluation of Timing Regarding the Use of Sunscreen Creams						
	Student		Parent		p	
	n	%	n	%		
<b>When to apply sunscreen for best protection?</b>						
Just before exposure to the sun	89	13.6%	93	15.1%	0.573	X <sup>2</sup>
15-30 minutes before sun exposure	546	83.6%	501	81.5%		
Within 15-30 minutes after sun exposure	18	2.8%	21	3.4%		
<b>How often should sun protection factor (SPF) 30 sunscreen should be reapplied?</b>						
In every 30 minutes	150	23.0%	134	21.8%	0.153	X <sup>2</sup>
In every 2-3 hours and more often when swimming or sweating	433	66.3%	393	63.9%		
None of the above	70	10.7%	88	14.3%		
X <sup>2</sup> Chi-square test						

Table 6. Awareness of Skin Cancers						
	Student		Parent		p	
	n	%	n	%		
<b>Dark-skinned people do not have skin cancer</b>						
True	34	5.2%	39	6.3%	0.386	X <sup>2</sup>
False	619	94.8%	576	93.7%		
<b>The only way a person can get skin cancer is overexposure to sun</b>						
True	94	14.4%	111	18.0%	0.077	X <sup>2</sup>
False	559	85.6%	504	82.0%		
<b>Which of the following increases your risk of skin cancer?</b>						
Three severe sunburns in the past	54	8.3%	76	12.4%	0.021	X <sup>2</sup>
Having a family history of skin cancer	182	27.9%	198	32.2%	0.105	X <sup>2</sup>
Both options above	390	59.7%	313	50.9%	0.002	X <sup>2</sup>
None of the above	27	4.1%	28	4.6%	0.820	X <sup>2</sup>
<b>What is the most common type of skin cancer?</b>						
Malign Melanoma	313	47.9%	284	46.2%	0.508	X <sup>2</sup>
Basal Cell Carcinoma	146	22.4%	125	20.3%		
Squamous Cell Carcinoma	87	13.3%	95	15.4%		
None of the above	107	16.4%	111	18.0%		
<b>Which of the following may be a sign of skin cancer?</b>						
A sudden or gradual change in the appearance of a mole	177	27.1%	175	28.5%	0.549	X <sup>2</sup>
A wound that does not heal	83	12.7%	91	14.8%		
Both options above	359	55.0%	315	51.2%		
None of the above	34	5.2%	34	5.5%		
X <sup>2</sup> Chi-square test						

## DISCUSSION

It has been reported that skin cancers increase every year in epidemiological studies. Between 2001 and 2010, there was an annual increase of at least 1.6% new incidence. In addition, it has been emphasized that the rates of non-melanoma skin cancers (NMSCs) have increased by 77% in the last 20 years, and malignant melanoma has increased by at least 250% in the last 40 years in young adulthood, adolescence and childhood (6). Due to the increasing frequency, it is very important to be aware of the harmful effects of the sun and to be aware of protection measures. As far as we know, no study has been conducted in Turkey comparing these knowledge and protection attitudes among university students and their parents. However, in a survey conducted by Selçuk et al. in 2019, university students aged 18-26 were evaluated and sun protection behaviors such as wearing hats, wearing long sleeves, using sunglasses and preferring to sit in the shade were evaluated, and it was reported that the participants had high sun protection rates, especially in medical students (7).

Due to the increase in the use of social media and the ease of access to information today, it can be thought that university students have higher knowledge of sun damage and protection attitudes compared to their parents. However, in this study, parents' knowledge, and protective attitudes against the harmful effects of the sun were found to be similar to those of university students in most parameters. This may be due to the fact that this age population also uses social media more actively today and makes use of resources such as conventional media methods.

In a cross-sectional study conducted with university students in Brazil, although sun awareness was found to be higher in health sciences faculties compared to other faculties, it was reported that all participants had sufficient awareness. However, despite the fact that the information questioned in this study is very basic, it has been emphasized that 10% of the population still does not have sufficient information. In addition, although skin cancer and sun damage are known, the frequency of use of sunscreen methods was found to be quite low, and it was found that only one third of the participants used sunscreen regularly (8). Since our study does not only measure the knowledge and protection levels of university students, but also compares this information with their parents, it is not

very appropriate to make these inferences. However, the knowledge of university students regarding the harmful effects of the sun is generally sufficient. The group selected in our study was not exclusively selected from medical branches but is a heterogeneous group that includes all faculties. The knowledge of the individuals participating in our study about the harmful effects of the sun showed different results in different questions and can be interpreted as medium-high in general.

In this study, both university students and their parents were found to be highly aware of the need to monitor their nevi and to consult a dermatologist in this regard. However, the rates of skin self-examination habits in both parent and student groups were quite low (parents: 39%, students: 37.1%). Self-examination for breast cancer has become very popular and practiced across society. The internet, conventional media organizations, social media and patient schools have played an important role in obtaining these results (9). However, skin self-examination is not a known and prominent concept today. In a study conducted in 2013, it was determined that only 22% of the participants in all age groups performed annual skin self-examination (10). Although the rates are observed to have increased compared to this year in this study, we still think that it is not an adequate rate. In a study conducted of adolescents in Northern Cyprus in 2019, it was reported that skin self-examination was performed by 39.8% of 163 participants, and was higher in women (11). It has been reported that sensitivity in skin self-examination is between 25% and 93%, but these studies are not randomized-controlled studies (12). Although it has been reported that this examination can be facilitated with mobile phone applications, it has been shown in a randomized-controlled study conducted in Australia that mobile phone applications are not superior to self-examination with naked eye (12). We think that it is necessary to organize community-based education studies and patient schools on skin self-examination. Thus, earlier diagnosis and better response to treatment of skin cancers will be possible and morbidity, mortality and economic burdens related to these diseases will decrease.

Today, with the increasing frequency of social media use and the concern of looking more beautiful and aesthetic, artificial tanning such as solariums and natural tanning such as sunbathing have become increasingly popular among the young population. There is an increasing amount of data showing that the facial appearance of a person significantly affects factors such as personality and attractiveness perception (13). People now use social media platforms such as Instagram more often than other communication methods. The rate of use of these platforms can reach 90%, especially among young individuals between the ages of 18-29, and different photos and content are watched continuously or intermittently. Trends such as looking slimmer are increasing day by day on social media platforms and can lead to a number of consequences such as body dissatisfaction (14). In a study, 80% of young adults between the ages of 18 and 25 who used tanning beds regularly or intermittently used Facebook, 30% regularly or intermittently used Twitter and Instagram platforms, and those who regularly used Instagram and Twitter had higher rates of tanning bed use (15). In addition, it was emphasized that advertising on these platforms to promote artificial tanning is also legal in some countries and the view that this may increase use should not be ignored (16). In this study, data on advertisements promoting artificial tanning were not evaluated. In addition, individuals were not questioned about their artificial tanning habits, but only whether they were aware of the harms of these methods. In the study, students were expected to have higher awareness than their parents. However, the opinion that a solarium is harmful was not found to be statistically significant between the two groups. However, the statement "it is possible to get a tan without any negative effects while using sunscreen" was not commented on correctly at a high rate, like the previous statement, and there is no statistical difference between the two groups. It shows that dermatologists should also contribute to education in these age groups as a preventive medicine duty. In addition, the idea that "gradual tanning removes most of the negative effects of long-term sun exposure" was positively received in both groups. In order to replace this knowledge, family physicians, especially dermatologists, and all branches that take an active role in preventive medicine have important responsibilities.

The questions evaluating the timing and frequency of application of sun protection creams were answered correctly by 81.5% and 83.6% of both parents and students, respectively, and there was no statistical difference between the groups. In addition, the participants answered

with high accuracy that the frequency of sunscreen should be repeated every 2-3 hours during the day and that it should be applied more frequently with sweating and swimming (parents: 63.9%, student: 66.3%), and there was no statistical difference between them. However, the applicability of this correct information by these people was not evaluated in this study, which is one of the limitations. Although the level of knowledge is high, the participants may not be using sunscreens correctly. While this situation may be caused by reasons such as cost, it may also be due to not completely understanding the extent of sun damage.

In our study, information about sun damage was determined at various levels in both groups. For example, participants believe that gradual tanning protects against the harmful effects of the sun and that tanning is an indicator of health. In addition, the number of people who think that tanning is necessary to meet their vitamin D needs has been determined at a very high rate. Moreover, protection attitudes such as wearing a hat, using sunglasses, or preferring the shade of the umbrellas in outdoor areas were also evaluated as moderately high. Although the participants knew that their nevi should be followed up by a dermatologist, the rate of skin self-examination was not very high. The rate of consulting a dermatologist on sunscreen products was found to be significantly higher in the university student group compared to parents. Necessary educations and workshops should be conducted in order to increase the rate of application to the right resources for the parent group in terms of choosing the right sunscreen products.

To acquire sun protection habits, it is important to give education at earlier levels, especially at primary school ages. However, according to the data obtained from the study, some misconceptions and misinformation about the harmful effects of the sun and protection persist among university students. For this reason, we are of the opinion that it is not late, and even necessary, to provide relevant education at these ages. In addition, it is very important to determine whether sunscreen usage habits are governed by cost or incomplete information in further studies.

## CONCLUSION

Since this study is an online survey based on personal reporting, it does not include an objective physician evaluation. This is especially valid for determining the Fitzpatrick skin type. In addition, considering the cross-sectional



nature of the study, it is not correct to make inferences about causality. In this study, it is not known at what age the individuals who say they have the habit and awareness of sun protection implement these practices, and whether they apply them in every situation. Large-scale and multi-center studies are required to determine these issues.

## DECLARATIONS

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**Conflict of interest:** All authors declare that there is no conflict of interest.

**Ethical approval:** All protocols for this study were approved by the Istanbul Kent University Ethics Committee (Decision No: 2020-07).

**Authors contributions:** Establishing the main idea and hypothesis of the study: A.N.A and N.C.; Developing the hypothesis and designing the materials and methods section: A.N.A and N.C.; Evaluation of data: A.N.A, Z.T and N.C.; Writing the introductory part of the article: A.N.A and B.E. ;Writing the conclusion and discussion sections of the article: A.N.A, B.E, Z.T and N.C.; Writing the draft of the article: B.E, Z.T.; Assessing the final version of the article and making necessary corrections: A.N.A, Z.T, B.E and N.C

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