



Evaluation of knowledge, attitude, and behavior about harmful effects of the sun and sun protection among patients attending an outpatient clinic

Polikliniğe başvuran hastalarda güneşin zararlı etkileri ve korunma yolları ile ilgili bilgi, tutum ve davranışların araştırılması

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Abstract

Background and Design: The aim of the study was to evaluate harmful effects of sun exposure and knowledge, attitude and behaviors related to sun protection among patients attending our outpatient clinic.

Materials and Methods: A total of 400 patients (171 male and 229 female) aged between 16 and 89 years were included in this study. Subjects were requested to fill out a questionnaire composed of 52 questions. In the first part of the questionnaire, patients' socio-demographic characteristics, history of sunburn, first-degree relatives with a history of skin cancer; in the second part, knowledge about harmful effects of sun and sun protection were inquired. In the third part, patient attitude and behaviors related to sun protection was evaluated.

Results: Our results revealed that 69.25% of patients had satisfactory level of knowledge. While the level of knowledge was not affected by economic status, place of residence, skin type and presence of skin cancer in participants or their first-degree relatives, it was found to be increased with increasing educational level. The patients were found to prefer avoiding mid-day sun (75.5%) and staying in the shade (64.8%) chiefly as sun protection methods and 45.3% of patients were found to use sunscreens. Most frequently preferred sources of information about harmful effects of the sun and sun protection methods were found to be television, magazines and newspapers (76.3%), doctor's advice and internet, respectively.

Conclusion: Although a satisfactory level of knowledge about harmful effects of the sun and protection methods was found, it was observed that individuals could not convert their knowledge into the sun protection behavior.

Keywords: Sun protection, ultraviolet, sunscreens

Öz

Amaç: Polikliniğe başvuran hastalarda güneşin zararlı etkileri ve korunma yolları ile ilgili bilgi, tutum ve davranışların araştırılması amaçlandı.

Gereç ve Yöntem: Çalışmaya yaşları 16-89 arasında değişen 171 erkek ve 229 kadın, toplam 400 hasta dahil edildi. Tüm hastalara 52 soruluk bir anket formu uygulandı. Anket formunun birinci bölümde hastaların sosyo-demografik özellikleri, güneş yanığı öyküsü, birinci derece akrabalarında deri kanseri öyküsü, ikinci bölümde güneşin zararlı etkileri ve korunma yolları hakkında bilgi düzeyleri, üçüncü bölümde ise tutum ve davranışları değerlendirildi.

Bulgular: Hastaların %69,25'inin bilgi düzeyi yeterli bulundu. Ekonomik durum, ikamet, deri tipi, kişide ve birinci derece akrabalarda deri kanseri varlığı bilgi düzeyini etkilemezken, eğitim seviyesi arttıkça bilgi düzeyinin arttığı görüldü. Hastaların güneşten korunma metodu olarak en çok gün ortası güneşinden kaçınma (%75,5) ve gölgede durma (%64,8) yöntemlerini tercih ettikleri ve %45,3'ünün güneşten koruyucu ürün kullandığı saptandı. Güneşin zararlı etkileri ve güneşten korunma konusunda en çok bilgi edinilen kaynaklar sırasıyla televizyon, dergi ve gazete (%76,3), doktor önerisi ve internet olarak bulundu.

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Sonuç: Hastaların güneşin zararlı etkileri ve korunma yolları hakkındaki bilgilerinin genel olarak yüksek düzeyde olduğu bulundu. Bununla birlikte kişilerin bilgi birikimini güneşten korunma davranışına dönüştürmedikleri gözlemlendi.

Anahtar Kelimeler: Güneşten korunma, ultraviyole, güneşten koruyucular

Introduction

The effects of sunlight on developing nevi and skin cancers show prominent differences among countries depending on personal and environmental factors. The DNA mutations caused by ultraviolet (UV) were described in 1960 and the signaling pathways targeted by specific genes and these mutations were identified in 1990s. Today, UV has been evidenced to be one of the environmental carcinogens¹⁻³.

There has reportedly been an increase in melanoma and non-melanoma skin cancers starting from the first half of the twentieth century. Reducing exposure to sunlight is the basic behavioral goal to prevent skin cancer development and the public should be made aware of the dangers of intense UV and educated about the ways to prevent excessive sun exposure^{2,4}.

The purpose of this study was to investigate the knowledge, attitudes and behaviors related to the harmful effects of sunlight and the ways of protection in patients who presented to our outpatient clinic.

Materials and Methods

Patients aged 16 years and over who were able to read and write and who presented to the Dermatology and Venereology outpatient clinic and other outpatient clinics at our hospital between January 2013 and November 2014 were included in the study. Permission was obtained for the study from the local ethics committee of the Faculty of Medicine, Süleyman Demirel University (protocol number: 3/07.03.2012). After the patients were explained that a questionnaire would be distributed about the harmful effects of sunlight and the ways of protection and their verbal consents were obtained, the questionnaire, which took approximately 10 minutes to complete, was administered. The questionnaires were filled out through face-to-face interviews and then the patients were given a one-page informative brochure about the harmful effects of sunlight and the ways of protection.

The questionnaire consisted of 52 questions that were prepared with the help of similar studies in the literature and expert views. The questions from 1 through 9 in the questionnaire were prepared to reveal the socio-demographic characteristics of the patients, from 10 through 13 to inquire any history of sunburn, history of skin cancer in the first-degree relatives and the dermatologic characteristics of patients, from 14 through 34 to assess patients' level of knowledge and from 35 through 52 to assess their attitudes and behaviors.

There were 7 questions in the questionnaire about the harmful effects of sunlight on the skin, 7 about exposure to the sun in childhood and 7 about the use of sun protection products (SPPs), making a total of 21 questions. Nineteen questions were true/false/don't know questions and two questions were multiple choice. The knowledge level of those who gave right answers to at least 11 of the 21 questions was considered satisfactory.

There were 18 questions in the questionnaire to assess the attitudes and behaviors of the participants. In this section, the sources of information consulted about the harmful effects of sunlight and the ways of protection, the methods employed by the subjects to protect

themselves and their children, if any, from sunlight, and their use of SPPs were questioned in detail.

Statistical Analysis

The data were analyzed on computer using Microsoft Excel and the SPSS statistics software version 22.0. The descriptive statistics corresponding to the data obtained were given as frequencies and percentage distributions, pie charts and column charts, and for age as mean±standard deviation. Cross tabulations were formed for the intercorrelated variables to explore their joint distribution. Since the variables were categorical, the correlations between them were tested using the chi-square analysis. The significance level of the correlation between the results obtained was accepted as $p < 0.05$. The relationship between categorical variables was measured using the Phi and Cramer's V coefficients.

Results

The study included 400 patients, 200 who presented to the dermatology outpatient clinic and 200 who presented to other outpatient clinics. The age of the patients ranged from 16 to 89 years and their mean age was 37.74 ± 16.2 . The socio-demographic characteristics of the patients are given in Table 1.

Table 1. Socio-demographic characteristics of patients

	n	%
Gender		
Female	229	57.2
Male	171	42.8
Education level		
Primary school	142	35.6
High school	84	21
University	174	43.5
Marital status		
Married	259	64.8
Single	141	35.3
Residence		
City	231	57.8
District/village	169	42.3
Economic level		
Very low/low	39	9.8
Middle	336	84
Very high/high	25	6.3
Profession		
Student/public servant/healthcare professional	191	47.8
Housewife/retired	131	32.8
Free lance/farmer/worker	78	19.6

The study group consisted of 171 males (42.8%) and 229 females with (57.2%) and 64.8% of participants were married. 25.3% of patients were primary school graduates, 10.3% were secondary school graduates, 21% were high school graduates, and 43.5% of them were university graduates or students. Of the subjects, 6.3% had Fitzpatrick skin type 1, 23.3% - Fitzpatrick skin type 2 and 66% had Fitzpatrick skin types 3 and 4. It was found that 57.8% of the patients lived in cities, 30.8% in districts and 11.5% in villages. Of the participants, 84% stated that their economic status was middle, 9.3% - low, 6% - high, 0.5% - very low and 0.3% had very high economic status. It was reported that 81% of the patients worked in closed environments and 19% in open areas. A history of sunburn was reported by 76% of the subjects, but no statistically significant correlation was found between history of previous sunburn and knowledge level ($p<0.05$).

69.25% of subjects had sufficient knowledge on the harmful effects of sunlight and the ways of protection. We observed that although women gave better responses to the questions requiring knowledge, no statistically significant correlation was found between gender and patient knowledge level ($p>0.05$). 13.9% of women and 18.7% of men stated that they had sunbath or attended solarium for tanning. No statistically significant correlation was found between gender and having sunbath/attending solarium for tanning ($p>0.05$).

A statistically significant correlation was found between the patients' age and the level of their knowledge on the harmful effects of sunlight and the ways of protection and as the mean age of patients increased, the level of their knowledge on the harmful effects of sunlight and the ways of protection decreased ($p<0.001$). There was also a statistically significant correlation between education level and knowledge level and as education level increased, knowledge level also increased ($p<0.001$).

Of the participants, 25.8% were students and 23.8% were housewives. The rate of knowledge level sufficiency in relation to the harmful effects of sunlight and the ways of protection was 85.4% in the student group, while the farmer group had the lowest rate with 45.8%.

The knowledge level was found sufficient in 68.5% of those who had some skin disease and 70% of those who had no skin disease. No statistically significant correlation was found between the presence of a skin disease and the patients' level of knowledge on the harmful effects of sunlight and the ways of protection ($p>0.05$).

The patients were found to prefer mostly the methods of avoiding midday sun exposure (75.5%) and staying in the shade (64.8%) to

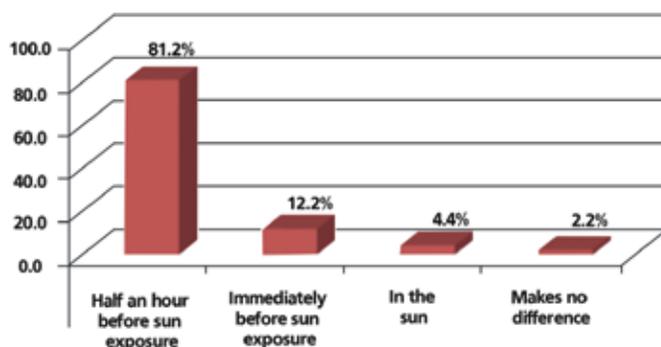


Figure 1. Patients' ways of applying sun protection products during the day

protect from the sun. The most widely used physical protection method was wearing a hat with 49.5%. As the patients' education level decreased, the rate of their taking no measures for protection from the sun increased in a statistically significant way ($p=0.032$).

SPPs were used by 45.3% of the patients while 54.7% stated that they did not use any SPPs. Lacking the habit was shown at the highest rate as the reason for not using SPPs (61.8%). Of the patients using SPPs, 64.7% were female and 35.3% male, and the difference was found to be statistically significant ($p=0.007$). The patients' use of SPPs was also found to have a statistically significant correlation with education level ($p<0.001$), age ($p<0.001$), marital status ($p<0.001$), economic level ($p=0.002$), residence ($p<0.001$), and the level of the subjects' knowledge on the harmful effects of sunlight and the ways of protection ($p<0.001$). No statistically significant correlation was found between the patients' history of sunburn ($p=0.25$) or their skin type ($p=0.645$) and use of SPPs.

The rate of patients who preferred SPPs with a sun protection factor (SPF) 30 and over was 60.2%. Of the patients who used SPPs, 52.5% stated that they used SPPs only when they would go out in the sun, 24.9% - once in the morning, 14.4% - every 4-5 hours and 8.3% used every 2-3 hours. When the patients using SPPs were questioned about the use of SPPs at seaside, 13.4% stated that they did not go into the sea and 70.5% that they would apply the SPP on the entire regions exposed to sunlight at the seaside. From the patients using SPPs, 81.2% stated that they would apply the SPP half an hour before going out in the sun, 12.2% - immediately before going out in the sun, and 4.4%, when being in the sun (Figure 1).

When the patients with children were questioned about their sun protection methods for their children, the most preferred sun protection methods used by the parents for their children were found to be avoiding midday sun exposure (85.7%) and staying in the shade (75.9%) (Table 2). The physical protection methods preferred mostly by the parents for their children were wearing a hat (84.9%), wearing sunglasses (35.5%) and SPPs (34.7%). Of the 243 people who had children, 34.9% stated that they used SPPs for their child/children. As the patients' education level increased, their use of SPPs for their children also increased in a statistically significant way ($p<0.001$). The parents were found to start using SPPs for their children mostly in their early babyhood (30.5%).

Table 2. Methods used by patients with children to protect them from sunlight (more than one choice could be marked)

		n	%
Sun avoidance	Not going out in the sun	5	2
	Sun avoidance at midday	210	85.7
	Staying in the shade	186	75.9
	Not avoiding the sun	5	2
Sun protection	Wearing cloths covering more of the body	77	31.4
	Wearing a hat	208	84.9
	Wearing eyeglasses	87	35.5
	Using an umbrella	16	6.5
	Using sun protection products	85	34.7
	Taking no protective measures	11	4.5

Television, magazines and newspapers took the first place with 76.3% among the patients' sources of information on the harmful effects of sunlight and the ways of protecting from the sun and doctor recommendation the second place with 53.8%.

While 26.8% of the patients rated themselves as being sufficient in terms of their level of knowledge on the harmful effects of sunlight on the skin and protection, 73.2% stated that they did not find their level of knowledge on this subject sufficient. From those whose level of knowledge was sufficient, 70% did not find their level of knowledge satisfactory and 19.5% of those whose level of knowledge was not sufficient, thought their level of knowledge was satisfactory.

Discussion

Exposure of human skin to environmental and artificial UV has increased due to ozone layer depletion, unnecessary use of solarium devices, and changing life styles and sports activities. Increased life span is also another important factor that increases the cumulative dose of UV⁵.

With respect to protection from sun in our country, Filiz et al.⁶ assessed the knowledge, attitudes and behaviors related to protection from the sun in high school students, Kaymak et al.⁷ in university students, Köktürk et al.⁸ in patients presenting to dermatology outpatient clinics, and Ergin et al.⁹ in mothers with children under five years of age. Moreover, Kaptanoğlu et al.¹⁰ have reported the findings in primary school children and their families in the Turkish communities in Turkish Republic of Northern Cyprus on similar subjects. In this study, we aimed at broadening the parameters for knowledge, attitudes and behaviors to obtain more detailed results.

Similar to that in a study by Yan et al.¹¹, we also concluded in our study that the level of knowledge of patients presented to the outpatient clinic about the harmful effects of sunlight and the ways of protection was generally high. We also found that the level of knowledge of patients consulting the outpatient clinic on the harmful effects of sunlight and the ways of protection increased as their education level increased and decreased as their mean age increased. The fact that as the mean age of the participants increased the mean education level dropped may have produced this result. It was also reported in another study that the parents with high level of education were more knowledgeable about protection from the sun and demonstrated more conscientious behaviors¹⁰. The knowledge level of singles turning out to be significantly higher compared to married subjects can be explained by the fact that the group comprised of singles had a higher level of education. Not having been able to establish a correlation between history of previous sunburn or skin type and the knowledge level of the patients did not meet our expectations that subjects who have had sunburns and those with light skins would be more knowledgeable about protection from the sun.

Stanton et al.¹² found that women had a higher level of knowledge about skin cancers and protection from the sun than men. Although we also found in our study that women had higher level of knowledge than men on the harmful effects of sunlight and the ways of protection, the difference was not statistically significant, but the rate of tanning behavior was found higher in men. This result may be associated with women's level of knowledge on the harmful effects of sunlight and the ways of protection being higher even though there was no statistically

significant difference in our study. Similarly, although female students gave better responses to the questions related to the harmful effects of sunlight in the study of Kaymak et al.⁷, they also found no statistically significant difference between them and male students.

In their study they made in Northern Ireland to investigate the knowledge, attitudes and behaviors related to protection from the sun, Owen et al.¹³ found that the level of knowledge in males in the 16-25 age group and in those older than 65 was statistically significantly lower than in other age groups. Unlike their study, we found in our study that the level of knowledge in patients in the 16-24 and 25-44 age groups were statistically significantly higher than in the 45-64 age group and in those older than 65. This can be explained by the fact that patients in the 16-24 age group who took part in our study had a higher level of education.

We found in our study that the subjects tended to perform more the acts of not going out in the sun at all, avoiding the sun at midday and staying in the shade as their sun avoidance behaviors rather than wearing more covering clothes for protection from the sun, wearing hats and wearing sunglasses. Avoiding the sun at midday was found as the most frequently used sun protection method in these patients. This can be explained by the fact that the physical methods such as wearing hats and sunglasses, and using SPPs are more difficult to implement in practice. Similarly, Kaymak et al.⁷ reported in their study that the sun protection method most widely used by those who cared about protection from the sun was not going out in the sun between 10:00 and 16:00 hours. Köktürk et al.⁸ also found that not going out in the sun between 10:00 and 16:00 hours was practiced at a rate of 53%.

In our study, the use of SPPs were found to be significantly higher in those who had a higher level of education, younger age, in women and singles, in those with higher economic level, those living in cities, and those with a higher level of knowledge on the harmful effects of sunlight and the ways of protection. It has been reported in similar studies that the rate of using SPPs significantly increases in those with higher levels of education and monthly income and in women^{8,14-17}. The results of a survey by Yurtseven et al.¹⁷ administered to the students in vocational schools of health showed that use of SPPs was higher in female students. In our study, use of SPPs was found higher in the 16-24 age group and in females. Although we found the rate of using SPPs lower in the similar age group compared to the study of Yurtseven et al.¹⁷, this may be due to the fact that students of vocational schools of health had higher level of awareness about protection from the sun. While forgetfulness was shown as the major handicap in the use of SPPs in a study by Lee et al.¹⁴, the results of our study showed that lack of habit was the major handicap in the use of SPPs.

In a study, the rate of using SPPs with a SPF less than 15 was 8.9% and the rate of using SPPs with a SPF over 30 was 6.1%⁷. We found in our study that the rate of using SPPs with a SPF less than 15 was 3.3% and those with a SPF over 30 was 60.2%, which may be attributed to the fact that people started to perceive in recent years that as the factor level increased, the effectiveness of the product in protection from the sun also increased and for this reason, people tend to use sun creams with higher factors.

Compatible with studies by Hutchinson et al.¹⁸ (44%) and Fernandez-Morano et al.¹⁹ (47.8%), 44.3% of subjects included in our study used

SPPs. In their study carried out in Australia, Pruij et al.²⁰ reported that 61% of subjects had repeated application of SPPs. In our study, 52.5% of patients using SPPs used them only when going out in the sun, 24.9% - once in the morning, 14.4% - every 4-5 hours and 8.3%, every 2-3 hours. The body region where SPPs were applied mostly in daily life was reported to be the face by 70.2% of patients and the rate of those applying SPPs on the body regions exposed to sunlight was found to be 30.9%. These results show that individuals using SPPs fall short of exhibiting repeating behavior during the day. However, we found in our study that 81.2% of those using SPPs used them half an hour before going out in the sun and 12.2% while going out in the sun. According to this result, it can be argued that the subjects participating in our study were more sensitive in applying SPPs half an hour before going out as compared to the results of similar studies²¹.

In a study made by Ergin et al.⁹ with mothers having children younger than five years, the sun protection method the mothers preferred mostly for themselves was staying in the shade in 96.3% and the methods they preferred mostly for their children were light-colored clothing, keeping them in the shade and having them wear hat. Avoiding the sun at midday and staying in the shade were the sun protection methods preferred mostly in our study. The most preferred sun protection methods by the parents for their children were avoiding the sun at midday, having them wearing hat and staying in the shade. This shows that adults tend to use the sun protection methods they prefer for themselves also for their children. This highlights the importance of educating first the parents and indirectly their children so that they reflect this awareness in their daily attitudes and behaviors in order to reduce exposure to sunlight, which is very important in childhood. We also found in our study that as the level of education increased in parents, the rate of their using SPPs for their children also increased and this was statistically significant ($p<0.001$).

While 26.8% of our study group rated their level of knowledge on the harmful effects of sunlight on the skin and protection as being sufficient, 73.2% stated that they did not find their level of knowledge sufficient. From those whose level of knowledge was sufficient, 70% did not find their level of knowledge satisfactory and 19.5% of those whose level of knowledge was not sufficient thought their level of knowledge was satisfactory. This may be associated with the fact that those with a low level of knowledge were not aware that they had incorrect information.

In a study, 44.5% of the participants stated that their sources of information on the ways of sun protection were television, magazines and newspapers¹⁰. Similarly, television, magazines and newspapers were in the first place among the sources of information on the harmful effects of sunlight and the ways of protection in our study. These results suggest that media organs, which hold an important place in our lives, can be effectively used for education purposes.

It was concluded in our study that the level of knowledge in patients presented to the outpatient clinics about the harmful effects of sunlight and the ways of protection was generally high. However, although the activities carried out in newspapers and television to educate the public raised awareness, they remained insufficient in promoting behavioral changes. Additionally, it is known that 80% of lifetime sun exposure occurs in childhood and development of skin cancer in later periods can be reduced by 78% in children using sun protectors routinely.

Development of skin cancers can be prevented to a large extent by avoiding the sun, using SPPs and dressing appropriately. Therefore, preventive healthcare services for protection from skin cancer should primarily focus on children. We also observed that children's sun protection behaviors change depending on the advices of their families. Families that have a high level of knowledge and protect themselves from the sun have been reported to protect their children from the sun as well²².

Conclusion

Our results suggest that it is not sufficient to educate the public about the harmful effects of the sun; they should effectively be given the consciousness for protection from the sun. We assume that both children and their families should be educated about the ways of protection from the sun in day nurseries, infant schools, and primary and secondary schools where children spend most of their day and this should be made a government policy.

Ethics

Ethics Committee Approval: The study was approved by the Local Ethics Committee of Süleyman Demirel University (Protocol number: 3/07.03.2012), Informed Consent: Consent form was filled out by all participants.

Peer-review: Externally peer-reviewed.

Authorship Contributions

Concept: Sevim Terzi, Pınar Yüksel Başak, Design: Sevim Terzi, Pınar Yüksel Başak, Data Collection or Processing: Sevim Terzi, Analysis or Interpretation: Sevim Terzi, Pınar Yüksel Başak, İjlal Erturan, Literature Search: Sevim Terzi, Writing: Sevim Terzi, Pınar Yüksel Başak, İjlal Erturan.

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