DETERMINING THE RELATIONSHIP BETWEEN SKIN CANCER AND SUN KNOWLEDGE AND BEHAVIOR IN ADULTS LIVING IN AN REGION WITH FOUR SEASONS OF SUN

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ABSTRACT

Purpose: The purpose of this study is to determine the relationship between skin cancer, sun knowledge, and sun protection behaviors of adults in the health center located in Dikmen region (North Cyprus).
Material and Methods: This study was conducted as a cross-sectional study between 20 June 2020 and 29 July 2020. The sample group of n=284 individuals were taken from the population served by the Dikmen primary health care center (N=1078). The data were collected with the 'Socio-Demographic data form', 'Fitzpatrick Skin Type Scale', 'Skin Cancer and Sun Information Scale' and 'Sun Protection Behavior Scale'. Frequency, percentage, mean, t Test, One-way Anova and Pearson Correlation Test were used for data analysis.
Results: Participants had the mean age of 49.0±17.6 and 53.2% of them were female. When the skin types of participants were examined according to the Fitzpatrick classification, it was found that 32.7% of them had average skin color. The 'Skin cancer and sun knowledge scale' (12.8±2.5) and 'Sun protection behavior scale' (23.6±6.8) total means score was found to be moderate level. A positive, weak, statistically significant relationship was realized between the participants' overall mean score of the 'Skin Cancer and Sun Information Scale' and the total mean score of the 'Sun Protection Behavior Scale' ($p<0.05$; $R=0.127$).
Conclusion: As a result of this study, it is understood that the sun protection knowledge level of the participants has no effect on their protection behavior.

Keywords: Skin cancer, UV, sun protection knowledge, fitzpatrick classification

INTRODUCTION

The sun is one of the most important sources of life. It has effects such as positively affecting the psychological state of people, vitamin D synthesis, stimulating melanin production, and providing visual function (1). Sunlight contains ultraviolet (UVA and UVB) that pass through the skin layers. Both UV A and UV B rays cause various levels of health problems. Skin cancer is mainly due to intense exposure of UV during early age and adolescence, but is associated with cumulative UV exposure (2). Variations in activities carried outside and exposure to sunlight over the past 70 years can be seen as a major factor in the increasing case of melanoma. Its incidence is closely related to the geographical region (3). In Cyprus, where sunbathing is high and solar energy is abundant due to its latitude, it is sunny for an average of 12 hours a day in summer. In winter,

Table 1. Socio-demographic characteristics of the participants (n=284)

Socio-demographic Characteristics		Mean±SD	
Age		49,04±17,65	
		n	%
Gender	Women	151	53,2
	Men	133	46,8
Longest lived place	Cyprus	259	91,2
	Turkey	25	8,8
Perception of material situation	Good	65	22,9
	Middle	207	72,9
	Bad	12	4,2
Education level	Illiterate	7	2,5
	Literate	7	2,5
	Primary school	99	34,9
	Middle school	36	12,7
	High school	94	33,1
	University and above	41	14,4
Working environment	Working out door	46	16,2
	Working in in door environment / not working	238	83,8
Fitzpatrick Skin Classification	White skin (Type I)	15	5,3
	Fair skin (Type II)	84	29,6
	Average skin color (Type III)	93	32,7
	Light-brown skin (Type IV)	61	21,5
	Brown skin (Type V)	31	10,9
Eye color	Light color	29	9,2
	Dark color	255	90,8

this value is around 8 hours on average. The average daily amount of solar energy throughout the year is 417.3 cal/cm2. Maximum solar energy is 622.2 cal/cm2 per day in July. The least solar energy is 214.5 cal/cm2 per day in December (4).

Skin cancer has had an estimated annual rise of about 3-7% throughout the past decade, but mortality rates are decreasing due to early diagnosis and treatment in Australia, the United States, and the continental European countries. For instance, in the USA, 108,420 new skin cancer cases occurred in 2020, 11,480 people died from skin cancer (5). While there are 1756 individuals diagnosed with new skin melanoma in Turkey (2020), 888 people died due to this reason (6). Cancers are the second leading cause of death in Northern Cyprus, but the prevalence of skin cancer is not fully known (7).

It is essential to determine the knowledge and behaviors of the sun about the harmful effects of UV and its relationship with skin cancer, to prevent skin cancers, to provide behavior change and to reduce the burden on public health. In the study conducted

by Sümen and Öncel, it was found that while teachers' knowledge behaviors towards sun protection were moderate, their sun protection behavior practices were low. (8). Leither et al. reported in their study that primary prevention campaigns were effective in reducing the incidence of melanoma to reduce UV exposure to youth in some populations (3).

In the literature, no study has been found that examines skin cancer knowledge level and sun protection behaviors conducted in any region of Northern Cyprus. This study is original and is thought to contribute to the literature. The aim of this study is to determine the relationship between skin cancer, sun knowledge and sun protection behaviors of adults in the primary health center located in Dikmen region (North Cyprus).

MATERIAL AND METHODS
Type of Research
The research was conducted between 20 June 2020 and 29 July 2020, as a cross-sectional type.

Table 2. Distribution of participants' skin cancer and sun knowledge scale mean scores

Skin Cancer and Sun Information Scale (Min:0 Max:25)	Min	Max	Mean±SD
Sun protection	0	7	3,24±1,15
Tanning	2	11	6,69±1,66
Skin cancer risk factors	0	3	1,73±0,85
Prevention of skin cancer	0	2	0,82±0,46
Symptoms of skin cancer	0	1	0,38±0,48
Total score	7	21	12,88±2,51

Table 3. Distribution of participants' sun protection behavior scale mean scores

Sun Protection Behavior Scale (Min:8 Max:40)	Min	Max	Mean±SD
Avoid the sun during the mid-day hours?	3	15	11,86±2,96
Use a sun screen?	3	15	6,20±4,07
Wear a hat	2	10	5,60±3,04
Total score	8	40	23,67±6,84

Population and Sampling of Research

The collaboration was made with the primary health care center located in Dikmen region (North Cyprus), and the sample was reached with the individuals who applied to this center. The population of the research consists of adults over the age of 18 registered in the primary health center in Dikmen region (N=1078). In the known population, sufficient sampling (n=284) was achieved with statistical calculations made with 95% confidence interval and 5% sampling error. Adults who applied to Dikmen Health Center during the process were included in the study.

Variables of the Study

While the independent variable of the study is socio-demographic characteristics, the dependent variables are the 'Fitzpatrick skin type scale' mean score, 'Skin cancer and sun information scale' mean score and 'Sun protection behavior scale' mean score.

Data Collection Instruments

The data collection was carried out by using the 'Socio-Demographic data form', the 'Fitzpatrick Skin Type Scale', the 'Skin Cancer and Sun Information Scale' and the 'Sun Protection Behavior Scale'. The

researchers prepared the "socio-demographic data form" by scanning the literature and consists of 17 questions (age, gender, education level, sun allergy, etc.).

Fitzpatrick skin type scale; It is the scheme in which human skin color is classified numerically. In 1975, Thomas B. Fitzpatrick developed this scale to predict how different skin types give response to ultraviolet (UV) light. It is possible to categorize humans into different Fitzpatrick skin types classification scale (I–VI), depending on to the total score (9).

Skin Cancer and Sun Information Scale; This scale consists of 25 questions and advanced by Day et al. in 2014 and validated and reliable in Turkish by Haney et al. in 2018. 15 questions are true or false, and 10 questions are multiple choice. In each item, the correct option 1 is matched with an incorrect option 0. The overall score reached by collecting the items differs between 0-25 points. The higher the score, the higher the level of knowledge (10).

Sun Protection Behavior Scale; Rossie et al. (1997) and Turkish validity and reliability studies were carried out by Aygün and Ergün (2013). In its Turkish version, the scale consisted of 8 items and 3 sub-dimensions (sun exposure, sun protection, using a hat) in a five-point scale *(1=never, 2=rarely,*

Table 4. Determination of the relationship between the sun protection behavior scale and the mean scores of skin cancer and sun information scale

Scales and sub-scales		Sun Protection Behavior Scale			
		Total score	Avoiding from the sun	Using a sun screen product	Wearing a hat
Skin Cancer and Sun Information Scale	Total score	p=0,032* R=0,127	p=0,878 R=-0,009	p=0,012* R=0,149	p=0,111 R=0,095
	Sun Protection	p=0,056 R=0,114	p=0,510 R=0,039	p=0,014* R=0,145	p=0,704 R=0,023
	Tanning	p=0,642 R=-0,028	p=0,237 R=-0,070	p=0,531 R=-0,037	p=0,345 R=0,056
	Skin Cancer Prevention	p=0,023* R=0,135	p=0,967 R=-0,002	p=0,002* R=0,182	p=0,930 R=-0,005
	Symptoms of Skin Cancer	p=0,005* R=0,166	p=0,040* R=0,504	p=0,005* R=0,167	p=0,064 R=0,110

p-value<0,05; R: Pearson Correlation Test

3=sometimes, 4=often, 5=always). 8 is the lowest possible score to be taken from the scale and the highest score is 40. Higher scale and item scores indicate better sun protection behaviors (11).

Application of Research

The data were collected by the researchers for about 15 minutes by using face-to-face interview technique in the health center located in Dikmen region.

Inclusion Criteria: Turkish language speakers, those who volunteered to take part in the research.

Exclusion Criteria: Persons under the age of 18 will not be included in the research.

Data Analysis

The statistical analysis was done by using Statistical Package for Social Sciences software version (SPSS) 21.0 (IBM SPSS Corp.; Armonk, NY, USA). Percentage, standard deviation, frequency, and mean were used for descriptive statistics. The data conformity to the normal distribution was tested with the Kolmogorov Smirnov Test, and the Independent t Test and One-way Anova tests were applied to evaluate the difference among the variables. Pearson Correlation Test was used to compare the scale means. All tests were set as *p*<0.05 for their level of significance.

Ethical Consideration

Before conducting the study, 'Institutional Permit' from Dikmen Municipality, to which Dikmen is affiliated, and "Ethics Committee Permission" from Near East University Ethics Committee (25.06.2020; 2020/80; 1123), 'Skin Cancer and Sun Information Scale' and 'Sun Protection Behavior Scale' written

permission was obtained from authors. Also, verbal consent was taken from the participants.

RESULTS

Characteristics of the participants are shown in Table 1. The mean age of the participants was 49.0 ± 17.6, 53.2% of them were in the female gender group, and 91.2% of them lived in Northern Cyprus for the longest time. 34.9% of the participants in the study are primary school graduates, 16.2% work outdoors, and 15.1% state that they have sun allergy. In addition, 25.0% of the participants have sunspots, and 25.4% have moles on any part of their body.

When the skin types of the participants were examined according to the Fitzpatrick classification, 32.7% of them were determined as average skin color (type III) and no individuals with black skin (type VI) were detected.

The average score distributions of participants' 'Skin cancer and sun knowledge scale' and its sub-dimensions are given in Table 2. The total mean score of the participants from the scale was determined as 12.8 ± 2.5 (min:7; max:21).

There was no statistical difference between the total mean score of the 'skin cancer and sun information scale' according to the Fitzpatrick Skin Type, sunspot, eye color and presence of moles (*p*>0.05).

Table 3 provides "Sun protection behavior scale" in sub-dimensions showing participants' average score distributions. The total mean score of the participants from the scale was determined as 23.6 ± 6.8 (min:8; max:40).

No statistical difference was detected between the total mean scores of the participants in the 'sun

protection behavior scale' according to the Fitzpatrick Skin Type, sunspot, eye color, and presence of moles (p>0.05).

The statistically significant correlation among the participants' total score on the 'Skin Cancer and Sun Information Scale' and the overall mean score on the 'Sun Protection Behavior Scale' (p<0.05, R=0.127) was weak.

DISCUSSION

In the literature, excessive exposure to the harmful sun rays causes many problems such as; immune system diseases, genetic effects, skin wrinkling/aging, skin, eye, etc. (12). It is stated that four out of five skin cancer cases can be prevented by protecting them from the harmful effects of sun rays (13,14).

It is estimated that 50% to 80% of the damage to the skin due to the sun is due to exposure to the sun intensely enough to cause sunburn in childhood and adolescence. However, many adults are exposed to the harmful effects of the sun by not using protective equipment (such as tools-needs, clothing) due to their desire to tan their skin and working in an open environment. In the study of Altunkurek, it was determined that the risk of sun damage varies according to the skin type (15). Literature shows that the presence of light skin, light eye color and nevus increases the risk of developing skin cancer (1,16,17). On the other hand, Haney et al. determined that it was more common in female students with freckles and a history of sunburn (10). In this study, it is thought that individuals are at risk for skin cancer when it is considered that the participants live on the island of Cyprus, which has plenty of sun rays and has a hot climate, and when the characteristics of the participants are examined.

In addition to the genetic characteristics of individuals, having information about skin cancer and being aware of the signs and symptoms of skin cancer provide early diagnosis, prevention and effective treatment. In the study of Yan et al. (2015), the participants' knowledge level of protection against the damaging impacts of the sun was determined at a high level (18). Similarly, in the study of Terzi et al. (2017), the participants' level of knowledge concerning the sun protection was found to be high (19). But; In the study of Sümen and Öncel, the average score of the teachers' 'skin cancer and sun knowledge scale' was found to be moderate (12.5 ± 3.2) (8). In this study, the average score of

participants' skin cancer and sun knowledge scale was found to be at a moderate level (12.8 ± 2.5). It is thought that this result is due to the low level of education of nearly half of the participants (Table 1).

In order to decrease skin cancer risk, many protective measures are applied to protect against the harmful effects of sun rays (20). These protective measures include choosing a shaded place, wearing protective clothing, and using high factor sunscreen when working outdoors during the hours when UV rays are strongest (10:00-16:00) (13,21). In the literature, it has been stated that the use of appropriate sunscreen, which is easier and more practical than other methods from an early age, has an impact on the prevention of skin cancer (22). Terzi et al. (2017); stated that parents do not expose their children to the sun at noon to protect them from the sun and they tend to avoid the sun (19). In the study of Sümen and Öncel, the teachers' average score on the 'sun protection behavior scale' was found at a moderate level (24.7 ± 6.2) (8). This study determined that the mean score of participants' sun protection behavior scale was at a moderate level (23.6 ± 6.8). This result is thought to be due to the fact that the majority of the participants spent their days indoors. However, the moderate sun protection behaviors of these participants, who are exposed to the harmful effects of the sun in all four seasons, can be interpreted as being at risk for 'skin cancer'.

Skin cancer continues to be a growing public health problem. Protection from skin cancer prevents disease development; its early diagnosis is effective in improving the prognosis of the disease. Thus, the knowledge and awareness levels of individuals about sun protection and skin cancer should be increased (23), Haney et al. (2018) found that knowledge and behaviors of nursing students in terms of sun health and skin cancer are insufficient (10). There is no study in the literature examining the relationship between sun knowledge and protection, and skin cancer behavior conjointly. In this study, it is found out that there is a weak positive relationship among the participants' mean score of the 'Skin Cancer and Sun Knowledge Scale' and the mean score of the 'Sun Protection Behavior Scale'. It is seen that the sun protection knowledge level of the participants does not affect their protection behavior. However, a moderate positive relationship was found among the 'signs of skin cancer' sub-scale and the behavior of 'avoiding the sun'.

Limitations of the Research

Study results cannot be generalized to the whole population. Therefore, this research is limited to the people who applied to the primary health center located in 'Dikmen Center' in Northern Cyprus.

CONCLUSION

In this study, it was determined that the average score of the adult individuals living on a sunny island and the 'Sun protection behavior scale' and 'Skin cancer and sun knowledge scale' was at a moderate level. In addition, there was a weak statistically significant relationship among the participants' overall score of the 'Skin Cancer and Sun Information Scale' and the total mean score of the 'Sun Protection Behavior Scale'.

It is recommended to carry out informative health programs in line with the recommendations of WHO on the harms of sun rays for adults. In addition, there is a need to carry out individual and community-based group trainings and practices to make it possible for knowledge to be transformed into behavior.

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