



Skin Cancer: Attitudes and Behaviors Among Adolescents for Sun Protection

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Abstract

Introduction: Sun exposure during childhood and adolescence is an important risk factor for all skin cancers. Sunlight stimulates a multitude of important biological effects on skin, causing, amongst other pathological and carcinogenesis changes.

Objective: This study was performed to evaluate the knowledge and behaviors among adolescence about the effect of sun's exposure as a cause of skin cancer.

Material and Methods: In this study, subjects between 14 to 19 years of age were recruited from the high schools in Tirana Albania. The participants were administered a questionnaire consisting of items related to knowledge, attitudes and behaviors related to protection protective behavior against skin cancers and sun protection. Descriptive data related to demographics and responses to the questions are presented.

Results: A total of 104 participants (mean age 17.63±1.08 years) were included. The study included 90(86.5%) male and 14(13.5%) female participants. Only 23.1% of adolescents recognized the harmful effects of ultraviolet in skin cancers and melanoma. More than 70% of adolescents had no knowledge about the risks factor for skin cancers and melanoma. More than quarter of them did not apply protective measures during sun bathing. Protective intervention behaviors were more presented to female adolescence compared to male.

Conclusion: Knowledge levels and protective behaviors of adolescence against the harmful effects of the sun and for protection against skin cancers were alarmingly low in the study population. It is necessary to provide educational intervention at adolescence education level. Dermatologic societies and media should intensify the sun protection campaign.

Keywords: Skin cancer, Melanoma, Attitudes, Sun protection

Introduction

Children and adolescents may be vulnerable to increased ultraviolet radiation exposure and greater risk for subsequent sun-related pathologies.¹ Evidence of harm associated with overexposure to ultraviolet (UV) rays is known. Skin cancer is the most common

pathology caused by UV radiation, in particular with the frequency of severe sunburns. Exposure to UV rays is therefore a preventable cause of skin cancer.^{2,3} According to the Center for Disease Control, the incidence rates for skin cancers are increasing, particularly among adults over the age of 65 years⁴ and melanoma is the third most common form of skin cancer.⁵

Quick Response Code:



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Received: 16 September, 2022

Published: 10 October, 2022

Citation: Cano E, Fida M, Vasili E. Skin Cancer: Attitudes and Behaviors Among Adolescents for Sun Protection. *SOJ Med Clin Case Rep.* 2022;2(2):1-6. DOI: [10.53902/SOJMCCR.2022.02.000514](https://doi.org/10.53902/SOJMCCR.2022.02.000514)

Sunburn is an indicator of both the intensity of a person's UV exposure and the person's sun sensitivity. Although use of sun protection has increased slightly in recent years, sunburn prevalence remains high.^{6,7} As consequence of these burns and the appearance of moles, some of them may develop skin cancer during later years.

Not just countries with high incidence of skin cancers but everywhere now health policy makers design and run programs for educating people for sun protection as an alternative in reducing the incidence of skin cancer and for early cancer detection (primary and secondary prevention campaign). It should also be noted that moderate degree of UV exposure is necessary for the production of Vitamin D which is essential for bone health.

Thus, public health policy on UV radiation needs to aim at preventing the disease burden associated both with excessive and with insufficient UV exposure.⁸ With this background, understanding knowledge and attitude of adolescents towards sun protection may prove useful measure for reducing the incidence of skin cancer.

Objective

The objective of this study was to evaluate the knowledge, attitudes and behaviors of adolescents towards sun protection measures.

Materials and Methods

Subjects between 14 and 19 years of age from *part of high school in Tirana, Albania* were recruited for this study. Permission of the ethical committee and the parents' consent in case of children below 18 years of age was taken.

A standardized questionnaire with five sections was prepared and used for each participant. The first section included details related to demographics; age, gender, place of birth, living place and parent's education, and employment status. Second section of the questionnaire included questions related to skin type, eyes color and presence of moles. Third and fourth parts of questionnaire were related to the knowledge of the effects of the sun on the skin and knowledge about skin cancers and melanoma. Adolescents were asked for recent and previous sunburn history, the use and efficiency of sunscreen and protective measures (like hat, protective clothes, glasses, hours of exposure etc) they use during sunbathing.

Statistical analysis

Continuous variables are presented as mean and standard deviation. Categorical data are presented as frequency and percentages. Differences in demographic data, type of skin, sun exposure and sun protection behavior among different personal characteristics of our participants were examined by using chi-squared test or Fisher's exact test. Also, regression analyses were conducted with each of the section sun-protection behaviors as dependent measures,

controlling for the effects of age, gender, and skin color. *P-values* less than 0.05 were considered as statistically significant. SPSS version 20.0 was used for statistical analysis.

Results

A total of 104 adolescents with mean±SD age of 17.63±1.08 years were enrolled in this study. Group I (14-16 years of age) included 30(28.8%) participants whereas Group II (17-19 years) included 74(71.2%) participants. The study included 90(86.5%) and 14(13.5%) males and females respectively.

A total of 11(11.6%), 20(19.2%), 51(49%) and 22(21.2%) participants were from class 10, 11, 12 and 13 respectively. Mothers of 1.9% participants had elementary education. A total of 55.76% and 57.70% participant's father and mother had high school education respectively Table 1.

Table 1: Demographic variables of adolescents.

Demographic variables	Total number	Percentage	P value
Gender			
Female	14	13.50%	0,005
Male	90	85.50%	
Age			
14-16 years old	30	28.80%	0,05
17-20 years old	74	71.20%	
Class			
Ten (10 class)	11	10.60%	0,001
Eleven (11 class)	20	19.20%	
Twelve (12 class)	51	49%	
Thirteen ((13 class)	22	21.20%	
Father's education			
Elementary	0	0%	0,001
Secondary	12	11.54%	
High school	58	55.80%	
University	27	25.96%	
Postgraduate education	7	6.70%	
Father employment			
Employed	88	84.60%	0,004
Unemployed	7	6.70%	
Unhealthy/Invalid	3	2.90%	
Retiree	6	5.80%	
Mother's education			
Elementary	2	1.90%	0,05
Secondary	10	9.60%	
High school	60	57.70%	
University	25	24%	
Postgraduate education	7	6.70%	

Mother Employment			0,05
Employed	64	61.50%	
Unemployed	37	35.60%	
Unhealthy/Invalid	2	1.90%	
Retiree	1	1%	

Phenotype data referring the general characteristic of type of skin, color of eyes and hairs of the participants are presented in Table 2. Most of adolescents had brown color skin and this color was maximum in both genders. Natural hairs also had predominance of brown color. Dark brown color represented high number among participants of both genders. Most of participants had brown eyes. Adolescents with green and black eye color were 13(12.5%) and 11(10.6%) respectively.

A total of 9(8.7%) of adolescents reported that always get sunburn without getting suntans (1 females, 8 males); 33(31.7%) mentioned that they get sunburn before having tan (5 females, 28 males); 41(39.4%) reported that almost have tan but sometimes sunburn (4 females, 11 males) whereas 15(14.4%) adolescents get suntans with-

out sunburn (4 females, 11 males). Six (5.8%) participants did not answer this session (1 female and 5 males).

A total of 11(10.6%) adolescents did not have mole on their body whereas 79 participants (76 %) reported to have 10-50 moles. About 50-100 moles were present in 10(9.6%) adolescents and more than 100 moles in 4(3.8%) participants. Only 9(8.6%) controlled the moles with a medical staff whereas 95(91.4%) did not control them. There was significant difference in the skin color, eyes color, skin burn when going to the beach for sunbathing, presence of mole on the body and control of mole based on the gender of participants Table 2.

A total of 66.3% and 76% adolescents had knowledge about the suntan and sunburn from UV rays respectively. Fifty one percent participants knew that prolonged exposure to the sun causes freckles and 38.5% knew that it causes wrinkles. A total of 28.8% of adolescents had good knowledge about risk of skin cancer with UV rays whereas 83.6% of them knew that exposure between 11:00 a.m to 4.00 p.m is too harmful.

Table 2: General information about the skin, eyes and hair type.

Type of the skin	Total number	Female	Male	P value
What color is your skin?				
a) Light	1	0	1	0.002
b) Fair	9	1	8	
c) Brown	88	13	75	
d) Dark brown	6	0	6	
Your natural hair color is:				
a) Red	2		2	>0.05
b) Blond	11	2	9	
c) Brown	51	10	41	
d) Dark brown	40	2	38	
Color of your eyes are:				
a) Blu	12	2	10	0.009
b) Green	13	1	12	
c) Brown	68	10	58	
d) Black	11	1	10	
Do you have sunburn during the childhood?				
a) No	51	6	45	0.001
b) 1 time	9	2	7	
c) 2 times	6	1	5	
d) More than 2 times	38	5	33	
Does your skin burn when you go to the beach for sunbathing? Self-reporting about the type of the skin.				
a) Always get sunburn without getting suntans; Tipi 1				0.004
b) Firstly, get sunburn before having tan; Tipi 2	9	1	8	
c) Tan, but sometimes sunburn; Tipi 3	33	5	28	
d) Get suntans without sunburn; Tipi 4	41	3	38	
e) Not specified	15	4	11	
	6	1	5	

Do you have mole on your body?				0.006	
a)	No	11	0		11
b)	I have 10- 50 (few)	79	1		67
c)	I have 50-100 mole (more)	10	12		9
d)	I have more than 100 moles	4	1	3	
Did you have controlled your mole?				0.026	
a)	Yes	9			9
b)	No	95	14		81

A total of 70.2% participants knew that sunscreen provides protection from UV rays whereas 55.7% knew that sunscreens with a sun protection factor ≤ 15 cannot protect them and 75% knew that one application of sunscreen protects their body for at least 4 hours Table 3.

Table 3: Knowledge and practice items.

No	Knowledge and practice items	No of correct answer	%
1	Ultraviolet rays cause suntan	69	66.3
2	Ultraviolet rays cause sunburn	79	76
3	Prolonged exposure to the sun causes freckles	53	51
4	Prolonged exposure to the sun causes wrinkles	40	38.5
5	Sun exposure causes skin cancer	30	28.8
6	The sunlight is more harmful to dark skin than to light skin	24	23.1
7	The sunlight is harmful to your skin only when you have sunburn in summer	56	53.8
8	Suntan is a sign of being healthy	43	41.3
9	Sunlight is stronger and harmful from 11:00 to 16:00	87	83.6
10	Sunscreen provide protection from UV rays	73	70.2
11	Sunscreens with a factor 15 or less cannot protect you	58	55.7
12	One application of sunscreen protects you for at least 4 hours	78	75

Knowledge about melanoma as a malignant skin cancer was present in only 24.03% whereas 75.7% had no knowledge about this. A total of 23.07% of adolescents thought that nothing can prevent skin cancer and that melanoma is the most dangerous type of skin cancer that can cause death whereas 51% had an opinion that frequent sunburns in childhood can increase the risk of skin cancer in older age. Correct answers to the questions related to number of moles in an individual is related to the risk of developing melanoma and skin ages faster after staying longer in the sun were provided by 35.6% and 45.2% participants Table 4.

Table 5 shows self-reported *sun protection behaviors and attitudes of during the sunlight harmful time* among male and female

participants. Female have a predominance in almost all of strategies regarding sunscreen usage and measures for harmful sunlight and protection of their body.

Table 4: Knowledge about risks associated with sun exposure among the adolescents.

No	Questions on attitude	No of correct answer	%
1	Do you know what melanoma is?	25	24
2	There is nothing that can prevent skin cancer	24	23.1
3	Melanoma is the most dangerous type of skin cancer that can cause death	24	23.1
4	Frequent sunburns in childhood increase the risk of skin cancer in older age?	53	51
5	The number of moles in an individual is related to the risk of developing melanoma	37	35.6
6	My skin will age faster if I stay longer in the sun.	47	45.2
7	I am aware that sun/UV exposure can cause skin cancer	65	62.5
8	A suntan makes me look more beautiful	56	53.8
9	A suntan makes me feel healthier	37	35.6
10	Solariums are a safe way to get skin tan	40	38.5

A total of 12(85.7%) females reported using sunscreen as compared to 32(35.5%) males. Sunscreen/sun oil with sun protection factor 30-50 were used by most of adolescents that reported sunscreen as protective measures (64.3% female and 18.9% male). Most of them said that during the sunlight harmful time they stay in the shade and/or use umbrella instead of leaving the beach. Mean-time female had predominance in wearing hat or sunglasses. Male had predominance only in wearing clothes that protect body during the harmful sunlight time Table 5.

Discussion

Adolescents are an important target group for sun protection interventions.^{9,10} Sun exposure during childhood and adolescence is thought to be of particular importance for skin cancer risk across the life span.^{11,12} New ways of encouraging adolescents to use sun protection strategies are needed to overcome substantial barriers

resulting in highly suboptimal levels of sun protection enactment.¹³

In this study we attempted to find the knowledge, attitudes and practices of adolescents from a high school regarding the effect of sun's exposure as a cause of skin cancer. In our study, *most of participants were males with large proportion belonging to the age group of 17-20 years. Professional high school, the site of study may explain the predominance of male participants than females. The school from which students were selected for the study also has a different study system; it has four study classes from grade 10 to grade 13 unlike other high schools with only grades from 10 to 12. The average grade of the adolescents in our study population was 11.8. Our study population was majorly from class 12 and 13.*

Table 5: Self-reported sun protection behaviors and attitudes during the sunlight harmful time.

Strategies regarding harmful sunlight	Female		Male	
	Number of cases	Percentage	Number of cases	Percentage
Use sunscreen	12	85.7	32	35.5
Sunscreen/sun oil with SPF more than 30	9	64.3	17	18.9
Sunscreen/sun oil with SPF less than 30	3	21.4	15	16.7
Stay in the shade or umbrella	10	71.4	55	61.1
Stay indoors	12	85.7	21	23.3
Wear a hat	5	35.7	20	22.2
Wear sunglasses	9	64.3	44	48.9
Wear clothes that protect body	2	14.3	19	21.1
Combination of sunscreen, hat and sunglasses	5	35.7	23	25.5
Combination of sunglasses and clothes	2	14.3	24	26.7

Many studies have reported that the ability of sunscreen use, prevent skin cancer and aging.¹⁴⁻¹⁷ In this study, levels of knowledge among adolescents about the effects of sun's exposure varied. Knowledge on effects of sun's exposure in causing of skin cancer, was poor, but knowledge regarding the harmful sunlight time was good.

Many studies have been reported the used of sunscreen protection measure regarding the sunlight UV.¹⁸⁻²¹ Knowledge regarding protection provided by sunscreen against UV rays was good in large number of participants. Lesser number of participants than this knew that using a sunscreen cream with a sun protection factor 15 or less cannot protect them. Three fourth participants knew that one application of sunscreen cream protects body for at least 4 hours.

Paradoxical with knowledges of adolescents about sunscreen use and its effect on skin protection, the behavior of participants

was unsatisfactory. Hence, practice of using sunscreen was low. The prevalence was almost the same with another study conducted in Turkey that evaluated knowledge, attitudes, and behaviors regarding sun protection, effects of the sun, and skin cancer among Turkish high school students and teachers.²² Another study conducted in Switzerland reported a much higher prevalence of using sunscreen.²³

In our study, female adolescents were significantly more aware of the protection offered by sunscreen and protective measures. Practice of using sunscreen was also more prevalent in females, probably due to their better knowledge than male participants. The divergence could be due to image-consciousness and appearance-focused nature of women compared to men.²⁴ Female predominance in sunscreen usage is also reported in other studies.²⁵⁻²⁷

Small sample size, cross-sectional study design and subjective responses are important limitations of this study. Larger, prospective studies are required to confirm these observations.

Conclusion

Knowledge levels and protective behaviors of adolescence against the harmful effects of the sun and for protection against skin cancer were alarmingly low. *Protective intervention behaviors were more commonly practiced by female adolescents than male adolescents.* We strongly recommended to provide education to school and college going students about sun safety or skin cancer prevention. Dermatologist, societies of dermatology and venerology, society and media should work in collaboration to maximize the reach of educational initiatives.

Author Contributions

EC, IZ, MF, EV: Conceptualization of the article, writing the draft, literature search, review of the draft, approval of the draft

AP and MG: Review of the draft, revision of the draft, approval of the draft

Acknowledgements

None.

Funding

None.

Conflict of Interest

Authors declares that there is no conflict of interest.

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