

Exposure and sun protection practices of university students

Práticas de exposição e proteção solar de jovens universitários
Prácticas de exposición y protección solar de jóvenes universitarios

Maristela Belletti Mutt Urasaki¹, Mirian Maria Muradi¹, Melissa Teles Silva¹,
Thaissa Ayumi Maekawa¹, Gizela Maria Agostini Zonta¹

¹Universidade de São Paulo, School of Arts, Sciences and Humanities, Obstetrician Course. São Paulo, Brazil.

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ABSTRACT

Objective: to learn exposure and sun protection practices for university students. **Method:** a descriptive, cross-sectional study performed at a university in São Paulo. **Results:** the sample consisted of 385 young and data collection conducted through a form. Of the total, 239 (62%) young people were classified as skin type III and IV and 69 (17.9%) affirmed to have a history of skin cancer in the family. Most affirmed exposure to the sun between 10 a.m and 04 p.m and for more than one hour; 112 (29.1%) informed not employ safeguards. Among those who use sunscreen, the minority does so regularly. **Conclusion:** although the sample was made up of people with greater access to information, it was found exposure and sunscreen improperly. Education, individual and collective actions should be strengthened and prioritized given the incidence of skin cancer in the country.

Key words: Radiation Exposure; Primary Prevention; Sunscreens; Public Health; Skin Cancer.

RESUMO

Objetivo: conhecer práticas de exposição e proteção solar de jovens universitários. **Método:** estudo descritivo, transversal, realizado em uma universidade de São Paulo. **Resultados:** a amostra foi composta por 385 jovens e a coleta de dados realizada por meio de formulário. Do total, 239 (62%) jovens classificaram-se como fototipo III e IV e 69 (17,9%) afirmaram ter histórico de câncer de pele na família. A maioria afirmou exposição ao sol entre as 10 e 16 horas e por mais de uma hora de duração; 112 (29,1%) informaram não empregar meios de proteção. Dentre os que utilizam protetor solar, a minoria o faz regularmente. **Conclusão:** embora a amostra tenha sido constituída por pessoas com maior acesso a informações, constatou-se exposição e proteção solar de modo impróprio. Ações educativas, individuais e coletivas devem ser fortalecidas e priorizadas tendo em vista a incidência de câncer de pele no país.

Descritores: Exposição à Radiação; Prevenção Primária; Protetores Solares; Saúde Pública; Câncer da Pele.

RESUMEN

Objetivo: conocer las prácticas de exposición y de protección solar de jóvenes universitarios. **Método:** estudio descriptivo, transversal, realizado en una universidad de São Paulo. **Resultados:** la muestra estuvo constituída por 385 jóvenes y la colecta de datos realizada a través de formulario. Del total, 239 (62%) jóvenes fueron clasificados como tipo de piel III y IV y 69 (17,9%) afirmaron tener cáncer de piel en la historia familia. La mayoría afirma exposición al sol entre las 10 y 16 horas y durante más de una hora; 112 (29,1%) reportaron no emplear métodos de protección. Entre los que usan protector solar, la minoría lo hace regularmente. **Conclusión:** a pesar de que la muestra haya sido constituída por personas con mayor acceso a informaciones, se constató exposición y protección solar de manera impropia. Acciones educativas, individuales y colectivas deben fortalecerse y priorizarse teniendo en cuenta la incidencia de cáncer de piel en el país.

Palabras clave: Exposición a la Radiación; Prevención Primaria; Protectores Solares; Salud Pública; Cáncer de piel.

CORRESPONDING AUTHOR

Maristela Belletti Mutt Urasaki

E-mail: mari.urasaki@usp.br

INTRODUCTION

Skin cancer is the neoplasia with the highest incidence in Brazil. The disease has different strains, the most common types called nonmelanoma skin cancer (NMSC) and melanoma type (MC). The NMSC is the most regular, responsible for 95% of diagnoses; it is a slow-growing tumor, locally invasive and good prognosis if treated in an appropriate and opportune manner, however, the delay in diagnosis can lead to ulcerations and severe physical deformities. The melanoma type is the least frequent and more severe, detected in 4% of patients; in the early stages can be cured, but, without treatment, may lead to the emergence of metastases that cause high mortality⁽¹⁻³⁾.

The estimated new cases of CPM of the National Cancer Institute (NCI) for 2014 was 182 130 cases. The agency predicts that this type of cancer remains the most frequent in Brazil. It appears that in 2020 the number of new cases will be of the order of 15 million worldwide⁽²⁾. The high incidence rate, beyond represents a strong financial impact on the public coffers and private health systems, determines serious psychosocial effects to people, compromising the quality of life⁽³⁻⁴⁾.

Studies show that there is a well-established association between the ultraviolet radiation (UV), especially ultraviolet-B (UV-B), and the incidence of skin cancer through facilitating genetic mutations and suppression of cutaneous immune response. Although factors such as skin type, phenotype and family history are also involved in the causal chain of the disease; sun exposure is recognized as the most important risk factor⁽⁵⁻⁶⁾.

Brazil is a country located in a region that receives intensive solar radiation. Moreover, the fact that exists a significant number of people performing labor and leisure activities in open spaces. Among these, are young adults considered candidates to suffer damage from radiation, insofar as they are often exposed to sport and leisure activities. Subject to cumulative exposure over their lives, are more propense to influence conferred by the aesthetic appreciation of tanning and are in the most prone age group of unprotected exposure⁽⁷⁻¹⁰⁾.

The inclusion of the sun protection actions can contribute significantly to minimize the cumulative levels of radiation exposure and its relation to the different types of cancer and other health problems. Lifestyle changes can, above all, reduce the need for mutilating surgery and undesirable aesthetic results^(3,11-12).

Recently, it was elaborated the Brazilian Consensus Photoprotection, the first official document about photoprotection developed in the country and focused on the Brazilian population⁽³⁾. The basic recommendations are equivalent to internationally accepted: restricted sun exposure, use of clothing and accessories (gloves, cap, hat, parasol, glasses) and topical photoprotection through sunscreen^(2-3,11,13). Another important measure is the self-examination of the skin. This practice is a potential tool to enable users to recognize early suggestive changes of malignancy⁽²⁾.

Despite medical advances, skin cancer today is a serious public health problem, both in Brazil and in many other countries, given the exponential growth of tumors in recent decades and the high mortality from melanoma⁽¹⁰⁾. The current scenario requires multidisciplinary care, being nurse a fundamental element since it brings together the proper training to

develop actions to promote skin health, prevention of dermatological diseases and recovery of skin health.

Therefore, it is of greatest importance to know the exposure practices and sun protection of young people and their knowledge about the risks of radiation on health. Unsafe exposure practices and lacking knowledge are part of the potential risk factors for the continuing increase in the number of cases of cancer and other damage. Moreover, the lack of understanding of these aspects makes it difficult to design effective interventions for different social groups.

From this perspective, it was developed the present study, which aimed to know the exposure and sun protection practices among university students and their knowledge about the risks of radiation.

METHOD

It is an exploratory, descriptive study, cross-sectional, a quantitative approach.

The population consisted of university students from different courses at a public university in the state of São Paulo. It was decided to develop a study with university students since they are considered as a vulnerable group to sun exposure and also because they represent a differential about the educational profile. Inclusion criteria were between 18 and 29 years old and not be in dermatological treatment.

The selection of the sample was for convenience and its size, of 385 students, was calculated considering the approximation of the frequency of responses through multinomial distributions. Data collection was performed between August and October 2012, through the application of anonymous form designed specifically for the study and composed of closed questions. The issues covered population characterization, practices related to exposure and sunscreen and knowledge of the risks of solar radiation on health.

The participant was asked to answer the question about skin type, based on skin color classification elaborated by Thomas B. Fitzpatrick⁽¹⁴⁾ that considers beyond the skin tone, the reaction to sun exposure. For this was presented an explanatory framework containing: type I – white (very fair skin, always burns, never tans); type II – white (fair skin, always burns and sometimes tans); type III – light brown (less clear skin, sometimes burns and always tans); type IV – moderate brown (light brown skin, rarely burns and always tans); type V – dark brown (dark brown skin, never burns and always tans); type VI – black (black skin, never burns, always tans). Contacts with students were held in the open spaces of the school and at times when they were not in study activities.

The ethical and legal aspects involving research with human beings were respected. The research was approved by the Ethics Committee of the School of Arts, Sciences and Humanities of the University of São Paulo.

The electronic database was built in Minitab 17. Data were submitted to descriptive analysis by distributing simple absolute and percentage frequencies. The associations between variables were analyzed using the Chi-square test and were considered significant when $p < 0.05$.

RESULTS

Young university students (n=385) participated in the study with a mean age of 21.8 years, being females predominant in the sample (60.7%). The skin types III and IV were the most frequent (62%) considering that the appointment was for self-reference. A quarter reported a history of a skin lesion by solar radiation, and 17.9% declared skin cancer family history. Young characterizing data are shown in Table 1.

The Table 2 shows that 55% of young, most of the time they are exposed to solar radiation between 10 a.m and 04 p.m and 67.4% are exposed to the sun for more than one hour. The exposure interval was evaluated by the participants according to their criteria, in short, medium and long. Of the total of 80 (20.7%) who reported being exposed to the sun for three hours or more a day, 29% considered this time as a short time. The mentioned reasons to explain the exhibition were displacement between work, school and home (76%), exposure to leisure and rest activities (21%), exercise practices (13%), work activity (11%) and activities at home (1%). To this question, 80 (20.7%) young people claimed more than one reason.

The data show that 22.1% were intentionally exposed to the sun for the purpose of tanning, with the highest frequency among women. Statistical analysis showed dependency relationship between gender and tanning ($p = 0.000$).

As for photoprotection practices, it is possible to observe, in Table 2 data that 112 (29.1%) participants indicated not to use any protection. The arguments presented were lack of discipline (87%), to like sun exposure and tanned skin (22%), high cost of sunscreen (5%), unnecessary protection due to skin color (5%), not assessing the texture of the products (4%), sun exposure less than thirty minutes per day (3%) and not using sunscreen because of chemical (1%).

Of 273 (70.9%) young people that adopt at least one type of solar protection, it was found that 121 (44%) use sunscreen associated with at least one other measure (search for shade, dress wear, wearing glasses, hat or cap and use of parasol), 80 (29%) use the sunscreen without associating another type of protection and 72 (27%) adopt protective practices and do not use sunscreen. Neither young person referred to the use of all the recommended measures. By analyzing the frequency of the type of adopted protection, it was noticed that women have a higher percentage, with a statistically significant difference.

The 201 (52.2%) young people who use sunscreen, 50% use only on sunny days, beach and pool and 67% never re-apply the product. Regular use was mentioned by 58 (15%) young people. The face was the most cited body part for the use of the product, and then the arms and hands. Other informed body segments were neck, legs and feet and ears. The minority referred to scars and tattoos. The most used sun

Table 1 - Characterization of young university people by gender, skin type, personal history of solar radiation injury and family cancer history, São Paulo, Brazil, 2012

Variable	SEX (N = 385)				Total
	Female		Male		
	n	%	n	%	
Age					
18 to 21	137	35.6	41	10.6	178
22 to 25	93	24.2	89	23.1	182
26 to 29	4	1.0	21	5.5	25
Skin Type					
I – II	66	17.1	30	7.8	96
III – IV	148	38.4	91	23.6	239
V – IV	20	5.2	30	7.8	50
Injury history by solar radiation					
No	171	44.4	118	30.6	289
Yes	63	16.4	33	8.6	96
Family history of skin cancer in the family					
No	193	50.1	123	31.9	316
Yes	41	10.6	28	7.3	69

protection factor by these young people range was 16-29 FPS (43%), followed by 60 or more FPS (33%).

The data in Table 3 show the relationship between skin types, grouped by approximate skin tones, and other variables. It was verified an association ($p < 0.05$) between the skin tone and all set variables, demonstrating higher incidence of cancer family history and higher morbidity for skin damage due to radiation among fair-skinned young people (skin type

I and II), lower daily sun exposure and increased adoption of protective practices by this group.

The obtained data of participants' knowledge about the harmful effects of sun exposure are shown in Table 4. All students reported at least one injury. Statistical analysis showed an association between knowledge about skin cancer and photoallergy and sex; for other diseases, there was no dependence between variables. According to participants, the

Table 2 - Exposure practices and photoprotection of university students, São Paulo, Brazil, 2012

Variable	SEX				Total	p* value
	Female		Male			
	n	%	n	%		
Daily exposure						
< 1h	84	21.8	41	10.6	125	
1h to 3h	104	27.0	76	19.7	180	0.202
> 3h	46	11.9	34	8.8	80	
Exposure time						
< 10 a.m or > 04 p.m	76	19.7	53	13.8	129	
Between 10 a.m and 04 p.m	123	31.9	89	23.1	212	0.025
All times	35	9.1	9	2.3	44	
Intentional exposure						
No	159	41.3	141	36.6	300	
Yes	75	19.5	10	2.6	85	0.000
Adopt protective measures						
No	77	20.0	35	9.1	112	
Yes	157	40.8	116	30.1	273	0.040
Type of protection**						
None	77	20.0	35	9.1	112	
Sunscreen	115	29.9	86	22.3	201	
Glasses	66	17.1	62	16.1	128	0.018
Search for shade and use of parasol	41	10.6	23	6.0	64	
Dress and use of cap or hat	18	4.7	23	6.0	41	
Use of sunscreen						
Regularly	35	9.1	23	6.0	58	
Only sunny days, beach and pool	58	15.1	43	11.2	101	
When remember	23	6.0	19	4.9	42	0.575
Never	118	30.6	66	17.1	184	
Sunscreen reapplication (N = 201)						
Never	80	39.8	54	26.9	134	
Once	17	8.5	23	11.4	40	
Twice	14	7.0	6	3.0	20	0.157
Three or more	4	2.0	3	1.5	7	

Notes: * Chi-square Test; **More than one answer per participant.

Table 3 - Phototype of university students according to family history of skin cancer, history of injury by solar radiation, exposure and photoprotection, São Paulo, Brazil, 2012

Variable	Skin Type						Total	p* value
	I – II		III - IV		V - VI			
	n	%	n	%	n	%		
Family history of skin cancer in the family								
No	45	11.7	222	57.7	49	12.7	316	0.000
Yes	51	13.2	17	4.4	1	0.3	69	
Injury history by solar radiation								
No	15	3.9	227	59.0	47	12.2	289	0.000
Yes	81	21.0	12	3.1	3	0.8	96	
Daily exposure								
< 1h	89	23.1	34	8.8	2	0.5	125	0.000
1 to 3h	6	1.6	139	36.1	35	9.1	180	
> 3h	1	0.3	66	17.1	13	3.4	80	
Type of Protection**								
None	21	5.5	73	19.0	18	4.7	112	0.001
Sunscreen	70	18.2	121	31.4	10	2.6	201	
Glasses	37	9.6	80	20.8	11	2.9	128	
Search for shade and use of parasol	21	5.5	33	8.6	10	2.6	64	
Dress and use of cap or hat	11	2.9	20	5.2	10	2.6	41	

Notes: * Chi-square Test; **More than one answer per participant.

Table 4 - Knowledge of university students about the complications caused by solar radiation, São Paulo, Brazil, 2012

Variable	SEX				Total	p* value
	Female		Male			
	n	%	n	%		
Skin cancer						
No	22	5.7	29	7.5	51	0.006
Yes	212	55.1	122	31.7	334	
Sunburn						
No	95	24.7	67	17.4	162	0.464
Yes	139	36.1	84	21.8	223	
Photoaging						
No	141	36.6	101	26.2	242	0.189
Yes	93	24.2	50	13.0	143	
Ocular diseases						
No	182	47.3	119	30.9	301	0.811
Yes	52	13.5	32	8.3	84	
Photoallergy						
No	205	53.2	142	36.9	347	0.039
Yes	29	7.5	9	2.3	38	

acquired knowledge was given by various sources: 57% cited school education, 36% the media (television, radio, internet and magazine) and 7% of health professionals.

Almost all unaware the existence of skin cancer prevention campaigns, only three universitarian proved to be informed.

DISCUSSION

The significant number of respondents with a history of skin cancer in the family reflects the data already well known about the high rate of people affected by the disease worldwide⁽²⁾. The personal history of radiation skin injury draws attention, given the epidemiological studies showing a strong association between the frequency of severe burn episodes induced by ultraviolet radiation and the development of melanoma. The most related to the occurrence of burns activity is exposure for tanning; practice found among the youth of this study^(5,10,15).

The results of sun exposure have shown adverse health practices, on the basis that 55% of young people affirmed being exposed to the sun at times when UVB radiation is more intense and harmful. DNA damage, generation of inflammation and carcinogenesis are characteristics mainly associated with this wave spectrum⁽¹⁶⁾. It was also observed that almost half of the sample is exposed to sunlight for one to three hours per day, and the clear skin is less exposed and intermediate skin the most, possibly because they better withstand the acute effects of radiation, as burns. It is well known that the epidermis and dermis suffer chemical and histological changes after persistent sun exposure and the body repairs damage caused by the absorption of radiation, but over-exposure can make repair less efficient⁽¹³⁾. The obtained results are similar to other studies^(10,15,17).

The exposure time to the sun rated by some students as short, as specialists located as high, reveals the perception of risk to impaired health. In leisure situations and weekends where the exposure time tends to be much higher, reaching more than six hours per day, the low perception of risk may become more critical⁽¹⁷⁾.

The displacement of work, school, and home was the main reason given for sun exposure, unlike other studies in which leisure activities and sports were the main reasons^(10,15,17-18). This information is very important for the educational process because these young people are five days a week subject to radiation on this conditions.

The practice of tanning, another identified aggravating and more present among women, indicates that tanned skin is still a desirable aesthetic standard of beauty, revealing the low perception of risk again. This custom is powered in part by three beliefs: that tanned skin makes a person more appealing, that tanning is beneficial to health and that the prior tanning prevents the undesirable effects of future exposure to the sun. The literature affirms that the age group that most search for tanning is young^(10,19).

As for photoprotection practices, although the data are more positive, also cause concern. A significant number of young people (29.1%) does not adopt even a protective measure as recommended. This fact is also observed in other studies, including those with more vulnerable populations such as postmen, physical education teachers and beach workers^(18,20-22).

The reasons given for not protecting were diverse, including financial reasons, naturalistic conceptions, ignorance of available resources, a cult of tanned skin and neglect of health. All these aspects need to be widely appreciated and covered in the educational process so that actions can make sense to the audience.

The use of sunscreen was mentioned by more than half the sample (52.2%). It was the most mentioned resource, however, most use it irregularly, only on sunny days. The sunscreen is seen by experts as the first line of defense against the harmful effects of radiation. It is a prophylactic element and therapeutic also because it contains molecules or molecular complexes that can absorb, reflect or scatter UV radiation⁽¹³⁾. Recent advances in research show that UVA radiation is as harmful as the strongest UVB radiation, being the time of the occurrence of a health problem the differential therebetween. On cloudy days, there is an incidence of UVA radiation and continuous exposure to these rays can lead to health problems that could be avoided⁽²³⁾.

The reapplication of the sunscreen, also necessary measure, has been declared by few. The trend for women to wear sunscreen daily more than men it is according to the literature^(15,17,19). Although women expose more, she protects more and have a greater perception of risk⁽¹⁰⁾.

The combined use of physical resources and sunscreen is strongly recommended to ensure greater safety to skin health^(1,3,11,13). In this sample, the isolated use of resources was greater than the combined use, indicating lower protection of this population. The sun protection factor (SPF) reported by 43% of the sample is well below what is considered healthy sun exposure, i.e., minimum SPF 30. On the other hand, a significant number (33%) indicated high SPF value above 60. There is a current concern in this regard called the paradox of sunscreen. Higher filter users would be more likely to burn for stay longer in the sun, relying on an extended action of the product⁽¹⁰⁾.

The glasses were the second most frequently cited measure by the young, but this result should be viewed with reservations due to the possibility of use is adherence to fashion and not for ocular health. Search for sunny restriction places and protection clothes were few frequent. The use of parasol was mentioned by women and caps for men. The use of hats and gloves hat was not mentioned. It is considered that these findings are related to the current fashion.

The body region prioritized for the use of sunscreen was faced, possibly for being a more visible area. Several segments were remembered, but it was not made allusion to moles (nevi), considered as markers for melanoma risk factor⁽¹⁰⁾.

As expected, the fair-skinned young adopted more protective measures than those of intermediate and dark skin. One possible explanation would be the highest frequency of injury by radiation and increased attention to the skin as a result of cancer cases in the family.

The knowledge of injuries resulting from radiation was found to be high for skin cancer and burns, the other problems were less frequent. The information that young people have, a few come from health professionals. Despite the knowledge of the association between solar radiation and cancer, other

important knowledge related to the disease and photoprotection were deficient, given the findings on the black skin does not have cancer risk, a little time in the sun not need protection and sunscreen use only on sunny days. These results are similar to other studies that link knowledge about risks and inappropriate protection^(9,24-25).

It should be noted that in spite of all young people are students with a solid academic base and with easy access to extensive networks of communication, this condition did not guarantee the adoption of fundamental measures about sun safety. Also, a significant number of students unaware of the existence of skin cancer prevention campaigns.

Gaps and weaknesses found in both exhibition practices as of photoprotection can be an indicator that the information and guidance are not reaching this population that should be given more attention.

The study presented results that can be useful and contribute to direct actions of nursing professionals in the quest to promote skin health and support specific decisions regarding the risk factor of greater prevention in carcinogenesis of skin cancer: inadequate exposure and lack of protection UV radiation. It is understood that the nurse has an important role in the consolidation of educational activities. Although these are not sufficient to change practice, represent an essential condition for any transformation process.

It is necessary for nurses to engage efforts to ensure that education actions contemplate guidance about photoprotection and that the activities and language be also directed to adults. It is important their participation in development actions for risk

perception of young people; disincentive to tanning practices and not supporting tanned skin image in the media; participation in the campaign activities of skin cancer prevention and contribution to address deficiencies related to this age group; cooperation in ongoing training of nursing staff, supporting the inclusion of lessons about photobiology and photoprotection in nursing curricula; participation in educational activities in schools and universities and support the urgent implementation of sun protection policy, among other measures.

CONCLUSION

The limitation in this study refers to the characterization of the skin type of the sample. The qualification of color and reaction to the sun was considered according to the participant's self-assessment, not being validated in real conditions of sun exposure.

The study allowed to identified that the university students are exhibited and protected from solar radiation improperly, which can compromise their health, especially in the future. The overview of the survey reflects the urgent need to implement public policies that address the safety and sun protection. Educational activities should be strengthened and prioritized given the magnitude of the problem.

It is up to nursing, as well as the entire multidisciplinary team, contributing to reverse the epidemiological prognosis of skin cancer and other diseases resulting from the damaging effects of solar radiation.

It is suggested to perform further studies to deepen understanding of the factors associated with unprotected sun exposure.

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