

Prevalence of sunscreen usage and perception about sun exposure and sunscreen: A lower-middle-income country's perspective

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Abstract

Sunlight is required for vitamin D synthesis but is also responsible for various adverse effects on human skin, including photo aging, sunburn, and skin cancer. To avoid this, regular use of sunscreens is recommended. The aim of the study was to evaluate the knowledge of a subset of our local population about exposure to sun and assess the attitude about the importance of sunscreen usage. This prospective cross-sectional study was conducted at the dermatology outpatient clinic using a predesigned questionnaire filled by the participants. A total of 200 patients were selected, out of which 135 were females and 65 were males. Forty-nine percent of the participants claimed to use sunblock; however, the majority (54%) used it only occasionally. Fifty-one percent of the participants were not aware that exposure to sun can cause darkening of the skin but more than 100(50%) were aware that this exposure has multiple side effects on the skin. It was also observed that participants had good knowledge about the side effects of sunblock. The study results concluded that participants have good perception of the effectiveness and side effects of sunscreen, most of them used it occasionally. It necessitates the need for a health education programme.

Keyword: Sunblock, sun exposure, sunscreen, perception, photoaging, sunburn, skin cancer.

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Introduction

Sunlight is required for vitamin D synthesis; furthermore, ultraviolet (UV) radiation (290 to 400nm) is responsible for various acute and chronic adverse effects on human skin, which includes photoaging, sunburn, and skin cancer.¹ Acute damage, like tanning and burning, has been reported with short-term exposure to UV radiation. However, long-term UV exposure can cause chronic skin problems like hyperpigmentation (solar lentiginos,

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melasma, and ephelides), skin aging (elastosis telangiectasias) and skin cancers.² For minimising the risk of melanoma and other forms of skin cancers, physicians and public health officials recommend avoiding intentional sun exposure and regular sunscreens usage.³ The main determinant of skin cancer is UV radiation from sunlight exposure, which is a modifiable environmental hazard.⁴ Skin cancers have rapidly increased over the past four decades and account for one out of every three cancer occurrences worldwide.⁵ Though the prevalence of skin cancer is significantly lower in Asians, Africans, Latin American, or American-Indian descent, it is responsible for significant mortality because of the atypical clinical presentation.⁶ Avoiding exposure to the sun is an effective and safe method to prevent skin cancers and photoaging.⁷ Sunscreens inhibit the transmission of UV radiation into the skin by absorbing, reflecting, or scattering these radiations.⁸ The Food and Drug Administration Authority has approved the use of sunscreens for the prevention of aging, sunburn, photo-induced pigmentation, and cancer.⁹

Nowadays, awareness about the hazards of unprotected sun exposure is increasing. However, compliance of our local population about the use of sunscreen or physical barriers for protection from sun rays is not satisfactory. In addition, there are a few other factors, like greasiness and price of the products that prevent the optimum use of sunblock.¹⁰ The rationale of the study is to evaluate the knowledge of a subset of our local population about the exposure to sun and assess the attitude regarding the importance of sunscreen usage. Currently, no such local study is available, and the results of this study would help to improve people's perception and misunderstandings about sun protection and sunscreens.

Methods

This prospective cross-sectional study was conducted after approval from the Ethical Review Committee at the dermatology outpatient department of Aga Khan University Hospital, Karachi, between June 2021 to November 2021. Patients who were known to have photodermatitis were excluded from the study. Patients above the age of 18 years with any cutaneous disease were included in the study. Using software Epi Info¹¹ and assuming a 95% confidence level with $p < 0.05$ and 50%

hypothesized frequency of the desired outcome, the estimated sample size was calculated at 200. Patients were selected through convenient sampling, and a self-administrated questionnaire was filled out by the patients. The questionnaire was divided into two parts: Part 'A' included general questions about gender, nature of occupation (indoor or outdoor), duration of daily sun exposure, frequency of sunblock usage, and type of SPF used, while Part 'B' assessed the knowledge and perception about sun exposure, side effects of sunscreens, and reasons for not using sunblock. The data were entered anonymously, and confidentiality was maintained. The data was analysed by using the statistical package for social science SPSS (Release 19.0, standard version, copyright© SPSS; 1989-02). Quantitative variables like age are presented as mean±standard deviation. Qualitative variables were reported in percentages and Chi-squared tests was used to evaluate the differences in the distribution responses between the groups. The significance of the results will be based on a 95% confidence interval and $p=0.05$.

Results

A total of 200 patients were enrolled in the study. The maximum number of 122 (61%) were between the ages of 10-29 years. Below the level of secondary education was found in 96(48.0%) and 169(84.5%) were working indoors. Weekly sun exposure of less than 10 hours was observed in 29 (14.5%) participants. Sunblock was used by 98(48%) patients and 69(34%) used it daily. Family history of skin cancer was reported by 5(2.5%). The SPF >50 (Sun Protection Factor) was used by 71(35.5%) participants whereas 36(18%) were not sure about the SPF they used (Table1).

Regarding sun exposure causing skin darkening, 49(24.5%) participants strongly agreed, whereas 56(28%) believed that sun exposure caused wrinkles and 75(37.5%) skin cancer. Sunblock protecting skin tanning was the belief of 92(46%) participants. Sunblock was not used due to financial reasons by 29(14.5%), greasiness 32(16%) and other side effects 10(5%). This study observed that the participants had a good knowledge of the side effects of sunblock (Table 2).

Discussion

The skin undergoes alteration because of exposure to the sun. Multiple types of cutaneous damages have been reported due to excessive sun exposure like moles, wrinkling, drooping, tanning, and skin cancers. Damage to the cell and DNA causing photo carcinogenesis can be controlled by using sunscreens and sun-protection measures on a regular basis. The prevalence of skin cancer

is lower in Asian and black non-Hispanics as compared to non-Hispanic whites. When these demographic groups are diagnosed with skin cancer, researchers have shown that they have a worse prognosis and survival rate.¹² Ultraviolet radiation exposure is responsible for the majority of melanomas.¹³ It damages the skin by causing DNA

Table-1: Demographic characteristics of the study participants and their habits of using sunscreen (n=200).

Variables	n (%)
Gender	
Female	135 (67.5)
Male	65 (32.2)
Age Range (years)	
10-29	122 (61.0)
30-49	68 (34.0)
50-69	9 (4.5)
70+	1 (0.5)
Marital Status	
Single	115 (57.5)
Married	85 (42.5)
Residence Area	
Urban	175 (87.5)
Rural	25 (12.5)
Education	
Below secondary	96 (48.0)
Undergraduate	41 (20.5)
Postgraduate	53 (26.5)
other	10 (5.0)
Socioeconomic Status	
High	39 (19.5)
Middle	159 (79.5)
Low	2 (1.0)
Occupational Nature	
Indoor	169 (84.5)
Outdoor	31 (15.5)
Family history of skin cancer	
No	195 (97.5)
Yes	5 (2.5)
Use of Sunblock	
No	87 (43.5)
Yes	98 (49.0)
Maybe	15 (7.5)
Duration of Sun exposure weekly	
< 5 hours	96 (48.0)
5-10 hours	75 (37.5)
Greater than 10 hours	29 (14.5)
Frequency of Sunscreen use	
Everyday	68 (34.0)
2-3 times a week	12 (6.0)
< 2-3 times a week	12 (6.0)
Occasionally	108 (54.0)
Sun Protection Factor in sunscreens	
15	62 (31.0)
30	16 (8.0)
50	15 (7.5)
> 50	71 (35.5)
Not sure	36 (18.0)

Table-2: Responses of participants about sunscreen and sunblock exposure.

Dimension	Questions	Strongly agree n (%)	Agree n (%)	Disagree n (%)	Strongly disagree n (%)
Knowledge about sun exposure	It can cause darkening	49 (24.5)	49 (24.5)	42 (21)	60 (30)
	It can cause wrinkle	56 (28)	57 (28.5)	75 (37.5)	12 (6)
	It can cause allergy	39 (19.5)	77 (38.5)	73 (36.5)	11 (5.5)
	It can cause cancer	75 (37.5)	58 (29)	55 (27.5)	12 (6)
Perception about sunscreen	It gives protection against UVR / sun damage	115 (57.5)	66 (33)	18 (9)	1 (0.5)
	It gives protection against skin tanning/ sunburns	92 (46)	85 (42.5)	22 (11)	1 (0.5)
	Prevent premature aging	65 (32.5)	62 (31)	66 (33)	7 (3.5)
	It will make skin fair	28 (14)	39 (19.5)	110 (55)	23 (11.5)
	Prevents skin cancer	57 (28.5)	88 (44)	53 (26.5)	2 (1.0)
	Prevent moles	30 (15)	63 (31.5)	97 (48.5)	10 (5)
	Never really thought about it	60 (30)	42 (21)	70 (35)	28 (14)
Reasons for not using sunblock	It is expensive	29 (14.5)	65 (32.5)	96 (48)	10 (5)
	It is greasy	32 (16)	84 (42)	70 (35)	14 (7)
	It has many sides effect	10 (5)	36 (18)	125 (62.5)	29 (14.5)
	Difficult to use	21 (10.5)	44 (22)	112 (56)	23 (11.5)
	Never really thought about it	60 (30)	42 (21)	70 (35)	28 (14)
Perception about side effects of sunscreen	Cause acne	13 (6.5)	66(33)	107 (53.5)	14 (7)
	Cause skin allergies	16 (8)	52 (26)	110 (55)	22 (11)
	Cause skin irritation	27 (13.5)	63 (31.5)	83 (41.5)	27 (13.5)
	Cause skin whitening	22 (11)	39 (19.5)	111 (55.5)	28 (14)

mutations, oxidative stress, and immunosuppression, which contributes to actinic keratosis, skin aging, and DNA damage.^{14,15} Many studies on sunscreen knowledge and usage have been conducted around the world, though no such studies have been conducted to address the perception, knowledge about sun exposure, and sunscreen usage in our local context.

In the current study, 51% of the patients were unaware that exposure to the rays of the sun can cause skin darkening, it may be because most participants had a literacy rate below secondary level. However, more than 50% of the participants were aware of the fact that exposure to sun rays can cause wrinkling, allergies, and skin cancers. Similar studies have been conducted in other countries in which their population also did not believe that sun exposure can cause darkening but they did know other effects of sun exposure.¹⁶

Furthermore, most of the participants agreed that sunblock can protect against UV rays and protect the skin from damage caused by the sun, sunburn, tanning, premature aging, and skin cancers. Several concordant studies reported similar results and their participants used sunblock to avoid tanning and sunburn.⁶ However, in the current study, most of the participants believed that sunblock doesn't improve skin colour and cannot prevent moles. This is because Pakistani population is constantly exposed to sun radiation due to the country's geographical location. The majority have a skin type (IV- V) with a dark complexion so photoaging, tanning, and sunburn are all considered normal; therefore, they believe that sunblock

does not protect the skin colour. Secondly, most of them were not aware that sunscreen should be applied at least 30 minutes before sun exposure to ensure proper efficacy.⁶

The prevalence of sunblock usage was noted to be 49% in the current study. This value was slightly less than the values that reported by Jerkegren et al (61%) and Memon, M.M. et al (69.5%).⁶ This is because 80% of the participants worked indoors. Moreover, it was observed that most of the participants were avoiding using sunblock due to financial concerns (47%) as they belonged to middle-income families, other reasons for not using sunscreens included greasy nature (58%), difficult to use (23%), many sides effect (32.2%), and (51%) never really considered using sunblock; similar results were also highlighted through literature. 10 Other identified causes for not using sunscreen in other studies were stinging and burning sensation in the eyes, fragrance, and forgetfulness.^{17,18} In our study, the participants did not believe in the myths related to sunblock and were sure that sunblock does not cause acne (60.5%), skin allergies (66%), irritation (55.5%), and whitening (69.5%) that indicates a good perception about the side effects of sunscreens. Another study observed few side effects of sunblock like skin allergies (23%), acne (31%), whitening (25%), and irritation (29%), though their population gave priority to cost (49%) and stickiness (73%) while selecting a sunscreen.¹⁰

The limitation of this study is that it was a single centre study, therefore, it cannot be considered representative of the entire population. Further, this study was done in the city so there may be a bias between urban and rural area

regarding skin types, their knowledge and practice against sun exposure and sunscreen. Also, the participants were not asked about the method of application of sunblock and other protection methods. In future, a multicentre study with a larger sample size is recommended to get a holistic response of the population.

Conclusion

The present study participants had a good perception of the effectiveness and side effects of sunscreen and most of the participants did use sunblock but only occasionally and those who did not use sunblock complaint about greasiness and high cost and were not aware of the availability of sebum controlling sunscreens. This necessitates the need for a health education programme. It is hoped that in future the results of the current study will be used for setting up a sun protection policy for our public.

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