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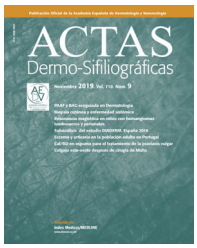

BRIEF COMMUNICATION

# Sun Exposure and Long-Distance Runners on the Spanish Costa del Sol: Habits, Attitudes, and Knowledge☆

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**Abstract** Exposure to UV radiation during the practice of sports in the open air is especially high in sustained recreational activities such as long-distance running. UV exposure increases skin photoaging and the incidence of skin cancer. This study aimed to describe habits and attitudes related to sun exposure among long-distance runners in our area of southern Spain as well as to evaluate the runners' knowledge of exposure. A cross-sectional descriptive study was designed to survey a convenience sample of participants in half marathons in Fuengirola and Marbella in September 2016. We found a high level of sun exposure among participants in this outdoor activity. The prevalence of sunburn was also high, experienced by half of the runners surveyed.


## Hábitos, actitudes y conocimientos sobre la exposición solar de corredores de fondo en la Costa del Sol

**Resumen** A nivel dermatológico, la elevada exposición solar a radiación ultravioleta asociada a la práctica de actividades deportivas al aire libre, máxime en actividades recreativas de larga duración como son los corredores de fondo, aumenta el fotoenvejecimiento de la piel y la incidencia de cáncer de piel. El propósito del estudio fue evaluar los hábitos, actitudes

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y conocimientos sobre la exposición solar de corredores de fondo de nuestra comunidad. Se realizó un estudio transversal descriptivo mediante encuesta con un muestreo de conveniencia entre aquellos participantes de las medias maratones populares de Fuengirola y Marbella celebradas en el mes de septiembre del año 2016. En la muestra evaluada se ha hallado una intensa exposición solar realizando actividades al aire libre, asociado ello a una prevalencia de quemaduras solares elevada (uno de cada dos corredores).


## Introduction

Sports activities and running in particular have grown in popularity in recent years in developed countries.[1] Indeed 52% of men and 33% of women in Spain reported some sort of sports activity in 2010.[2]

There is evidence of the positive effects of habitual running in terms of weight control, improved cardiorespiratory parameters, and lipid profile,[3] and an overall reduction in all-cause cardiovascular mortality (30%-45%) compared with nonrunners.[4]

In contrast, adverse effects have also been reported. Although the incidence of deaths during sports is extremely low (3.9 for every 10 million runners), traumatic lesions are frequent, particularly in new runners—30 lesions in for every 1000 hours of running.[3]

In the case of the skin, the high exposure to ultraviolet radiation associated with outdoor sports activities, particularly marked in long-duration recreational activities such as endurance running, has increased photoaging of the skin and incidence of skin cancer, particularly basal cell carcinoma and malignant cutaneous melanoma.[5] Existing evidence shows that a history of sun burn doubles the risk of developing cutaneous melanoma.[6]

The Campaign for Sun Protection and Prevention of Skin Cancer (*Campaña de Fotoprotección y Prevención de Cáncer de Piel* in Spanish), with the slogan *Enjoy the sun without harming your skin*, is a public health initiative in the health area of the Western Costa del Sol district. The aim is to promote healthy sun protection behaviors to reduce incidence of skin cancer in the community through strategies such as identifying high-risk populations such as beach goers,[7] children and adolescents,[8] and practitioners of outdoor sports, among others. The aim of the present study was to assess the behaviors, attitudes, and knowledge of sun exposure in endurance runners in our region.

## Methods

A cross-sectional descriptive study was undertaken with convenience sampling of participants in the open half marathons of Fuengirola and Marbella, Spain, in September 2016.

The study population were runners registered for the races who received information via a link to an online survey (SurveyMonkey) about participating in the study as they collected their race number. Participation was voluntary, with prior informed consent. The only requirements were to be at least 18 years of age and understand spoken and written Spanish.

The previously validated *Beach Questionnaire* on behaviors, attitudes, and knowledge of sun exposure on the beach was used.[9] The following sociodemographic characteristics were recorded: running experience, skin color and phototype, sun exposure behaviors (3 items), presence of sunburn in the previous summer, sun protection practices with responses on a Likert scale (6 items), attitudes relative to sun exposure organized on a Likert scale of agreement (10 items), and knowledge of the relationship between sun exposure and skin cancer, with true-false responses (10 items).

A descriptive analysis was performed using means (SD) for quantitative variables and frequency distributions for qualitative ones.

## Results

A total of 292 runners were surveyed; 273 of those who completed the items on sunburn the previous summer and who had completed a race of 5 or more kilometers in the past year were included in the study.

The mean (SD) age of the study participants was 40.1 (9) years, 83% were men, and 91.4% had secondary or higher education. Pale or very pale skin was reported by 34% of the study population and 20.9% were phototype I-II (Table 1).

Intense exposure to sunlight outdoors (>30 days/year) was found in 81.1% of the runners while practicing sports, and 52.5% reported the same level of exposure for sunbathing, and 28.2% for work activities. Overall, 51.3% (95% CI, 45.2%-57.4%) of runners reported the presence of sunburn the previous summer.

In the section on sun protection practices, the most frequently used were sunglasses (66.4%) and sunscreens (58.2%), with less frequent use of hats/caps (33.6%), and long-sleeve clothes (10.9%).

In terms of attitudes to sun exposure, more than 80% of the runners agreed with the use of sunscreen (items A4 and A5), and with items referring to sun protection (A6, A7, A8, and A9), whereas between 45% and 55% had a favorable attitude to sun exposure (A1, A2, and A3) (Table 2).

In the case of knowledge of the effects of sun exposure, of the 10 items assessed, the mean number of correct responses was 7.1 (1.1), with a correct response rate of less than 20% for items C4 and C8.

Table 1 Sociodemographic Characteristics and Sun Exposure Behaviors.

| Variable | Categories | n (%) |
|---|---|---|
| Sex | Male | 226 (82.8) |
| | Female | 47 (17.2) |
| Age | Mean (SD) | 40.1 (9) |
| Nationality | Spanish | 233 (86) |
| | Non-Spanish | 38 (14) |
| Level of Education | No education/primary education | 23 (8.6) |
| | Secondary education/higher education | 243 (91.4) |
| Marital Status | Single/divorced | 92 (33.9) |
| | Married | 179 (66.1) |
| Years Running | Less than 1 | 15 (5.6) |
| | 1 to 5 | 130 (48.1) |
| | 6 or more | 125 (46.3) |
| Skin color | Very pale/pale | 92 (33.8) |
| | Olive/brown/black | 180 (66.2) |
| Phototype | I-II | 57 (21.3) |
| | III-IV | 211 (78.7) |
| Days per Year Practicing Outdoor Activities (30 or more) | Beach-going | 137 (52.5) |
| | Sports | 219 (81.1) |
| | Working | 77 (28.2) |
| Sunburn During Previous Summer | None | 133 (48.7) |
| | Some | 140 (51.3) |
| Sun Protection Practices (Almost Always/Always) | Shade/sunshade | 134 (50.6) |
| | Sunglasses | 178 (66.4) |
| | Hat/cap | 91 (33.6) |
| | Long sleeves/trousers | 29 (10.9) |
| | Avoid midday | 151 (56.3) |
| | Sunscreen $\geq$ factor 15 | 156 (58.2) |

## Discussion

This study examined the behaviors, attitudes, and knowledge of sun exposure in endurance runners in the framework of a public health campaign. In the sample studied, intense sun exposure during outdoor activities was found, with a high prevalence of sunburn (1 out of every 2 runners).

Also of note is the limited use of caps (one-third), possibly the most important physical barrier for sun protection in this group, as the face and neck is the part of the body most exposed to sunlight during outdoor activity. Also of note are some contradictory attitudes to exposure, given that half of the sample liked having a tan despite concern about the risks of exposure to sunlight (marks, wrinkles, and development of skin cancer). Likewise, the level of knowledge related to sun exposure and skin cancer could be improved, particularly with regards the measures of sun protection.

In previous studies performed in adults in our community, the prevalence of sunburn found was lower than in the present study, with 29% among the population of beach goers,[7] and 41% among healthcare professionals,[10] whereas the reported prevalence was much lower in an adult population in Madrid (13.2%)[11] and in long-distance runners in Portugal (9.4%).[12]

With regards the use of sunscreen, the percentage of participants who habitually used such products (58%) was similar to that found in a study of marathon runners in central Europe (56%).[13] The favorable attitudes to tanning are in agreement with sun worship in which the population perceives tanned skin as attractive and healthy, despite the concern about skin cancer.

The findings regarding knowledge are in line with a prior systematic review, in which deficits in knowledge of skin cancer were assessed in the general population.[14]

Limitations of the study include the self-reporting by the subjects and the nonprobablistic sampling in which the response rate could not be calculated.

Recent evidence from big data analyses suggests that exercise is socially contagious,[15] with health interventions to tackle problems such as obesity being feasible. Our findings suggest the need to implement multifaceted educational strategies aimed at establishing sun protection behavior as a lifestyle habit in the community in general and in practitioners of outdoor sports in particular.

## Conflicts of Interest

The authors declare that they have no conflicts of interest.

Table 2 Attitudes and Knowledge of Sun Exposure.

| Variable | n (%) |
|---|---|
| *Attitudes (Agree - Very Much Agree)* | |
| A1. I like sunbathing | 127 (47.6) |
| A2. I like being tanned | 140 (52.4) |
| A3. Sunbathing makes me feel better | 139 (52.1) |
| A4. I don't like using sunscreen | 49 (18.4) |
| A5. It is worthwhile to use sunscreen | 247 (92.5) |
| A6. At midday, I prefer to be in the shade than in the sun | 231 (86.5) |
| A7. I am worried about getting burned when I sunbathe | 240 (89.9) |
| A8. I am worried about sunspots and wrinkles that may appear due to the sun | 237 (89.4) |
| A9. I am worried about skin cancer caused by the sun | 253 (94.8) |
| A10. It is easy to protect against the sun with a hat and clothes that cover us up | 206 (77.2) |
| *Knowledge (Correct Response)* | |
| C1. The use of UVA sunbeds before 30 years of age increases the risk of melanoma by 75% -T- | 227 (86.6) |
| C2. Ultraviolet radiation accelerates skin aging and causes several forms of skin cancer -T- | 250 (95.8) |
| C3. When in the shade, we are not at risk of suffering the effects of sunlight -F- | 206 (77.7) |
| C4. Using sunscreens is the best way to protect from the sunlight and prevent skin cancer -F- | 23 (8.7) |
| C5. Once the skin is tanned, it is not necessary to use sun protection -F- | 250 (94.7) |
| C6. Babies of less than 1 year should not be directly exposed to sunlight -T- | 242 (91.7) |
| C7. It is particularly necessary to use sun protection measures when the UV index is greater than 3 -T- | 253 (96.2) |
| C8. Dark clothing protects more against sunlight than light-colored clothing -T- | 52 (19.7) |
| C9. It is recommendable to have at least 1 hour exposure to sunlight per day to guarantee sufficient levels of vitamin D -F- | 111 (42.2) |
| C10. Children should use sunscreen with a protection factor equal or greater than 30 -T- | 250 (96.2) |
| No. of correct responses (10 knowledge items) - mean (SD) | 7.1 (1.1) |

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