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Original Article

Sunburns, Tanning, and Social Media: A Descriptive Study Among Spanish University Students

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ABSTRACT

Background: A positive attitude toward tanning has been associated with an increased risk of sunburn, which has been linked to an increased likelihood of developing skin cancer. The media have always played an important role in setting beauty standards in society. Nowadays, social media are widely used among younger generations, with the risk of promoting a preference for tanning.

Methodology: A cross-sectional observational study was conducted to examine sun exposure habits, sun protection practices, knowledge and attitudes related to sun exposure, frequency of sunburns, social media use, and visualization of messages on these platforms about sun exposure risks and tanning among Spanish university students, using the validated CHACES questionnaire.

Results: Overall, 86.7% of the sample (n = 691), consisting of university students, 73.3% of whom were female, with a mean age of 20.1 years, reported at least 1 sunburn in the previous year. A total of 75.2% and 83.1% of the sample reported having read information on social media about sun exposure risks and tanning, respectively. Photoprotection practices were deficient, with sunscreen being the most commonly used method, especially among women. Significant differences were observed in attitudes toward tanning, with women showing a greater preference for tanning than men. Being a woman and reading messages about tanning on social media were associated with a higher preference for tanned skin, increasing the risk of sunburn.

Conclusions: The high rate of sunburn among young people shows the magnitude of skin cancer risk and the need for effective strategies aimed at reducing the preference for tanning and sun exposure time, while improving photoprotection measures in this target population.

Background

Skin cancer (SC) is the most frequent neoplasm in fair or very fair skined populations.[1] Overexposure to ultraviolet radiation (UVR) is its primary cause. Good sun exposure (SE) practices should be acquired at a young age and maintained throughout adolescence[2,3] to prevent sunburns. During the first 20 years of life, sunburns significantly increase the risk of developing different types of SC in adulthood,[4] especially melanoma.[5] Recently, the incidence of this type of SC and of basal cell carcinoma has increased among people younger than 40 years, particularly young women.[6,7] This increase in this population is estimated to be caused, in part, by deliberate exposure to UVR to meet aesthetic standards related to tanned skin.[8] Intentional and unintentional tanning are associated with a higher risk of sunburn.[19]

The media play a crucial role in shaping aesthetic ideals, including the preference for tanning,[10] developed, in part, by Coco Chanel's campaigns,[11] which attributed attractiveness to tanned skin.[10,12] A century later, this preference persists,[13] and tanning remains one of the reasons for UVR exposure.[14] Therefore, seeing people with tanned skin in the media can establish tanning as a "social norm,"[14] and the use of Instagram and Twitter has been linked to increased artificial tanning practices.[12] Messages on social media (SM), including visual elements showing tanned skin,[15] can influence the desire to tan.[16]

This is particularly concerning among young people, as SM penetration is higher among those aged 16–24 years,[17] with use of 6.5 social

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media platforms per person,[18] especially the most visual platforms,[19] for approximately 3 h 4 min per day among women and 2 h 37 min per day among men.[17]

The use of SM in health communication has experienced significant growth.[20] The results of the first studies reviewing interventions in SC prevention[15,21–23] agree that SM has the potential to deliver effective messages, although there remain areas for improvement. Several studies acknowledge that the most common content on different SM platforms – Instagram in the United States,[24] Facebook,[22] and Twitter[23] in Spain – focuses mainly on melanoma and sunscreen use as a prevention method. This prominence overshadows other less aggressive but more common types of SC, as well as other photoprotection methods.

Other studies show a lack of efforts aimed at eliminating the preference for tanning in SC prevention messages.[15,25] In contrast, Mingoia et al.[10] concluded that their pilot SM intervention, conducted in Australia, was effective in reducing favorable attitudes toward tanning. Similarly, SM interventions aimed at reducing sunbed use in the United States through Instagram[26] or Facebook groups[13] have also been successful.

The objective of this study was to provide useful information for the development of communication campaigns aimed at Spanish university students, given their considerable SM penetration and vulnerability to sunburns and subsequent SC risk. Specifically, the study describes their habits, attitudes, and knowledge about SE and evaluates the information about tanning and SC that they receive on SM.

Methodology

Study design

We conducted a cross-sectional, observational, descriptive study to examine habits, knowledge, and attitudes related to SE, frequency of sunburns, and use and visualization of SM messages about SC risk and tanning among Spanish university students, using a validated survey.

Recruitment and sample

The study was conducted nationally by distributing an online survey through SurveyMonkey to lecturers at several public universities in Spain, requesting their collaboration in disseminating it among students. Voluntary responses were received from the universities of Granada, Madrid, Barcelona, Seville, Málaga, and Murcia between September 2022 and February 2023.

Questionnaire

The validated CHACES questionnaire[29] was used, including demographic data such as skin color, phototype, and history of sunburn, as well as practices, attitudes, and knowledge related to SE. Additional questions were included to address SM use and the reception of information about SE risks and tanning through SM.

Ethical considerations

The institutional review board of Universidad Rey Juan Carlos (URJC) granted ethical approval for the instrument, assigning it the internal registration number 1701202201422. Participants who completed the questionnaire adhered to the recommendations of the ethics committee at URJC.

Statistical analysis

Surveys answering questions about age, gender, considering cisgender responses, and presence of sunburn in the previous year were considered valid. The study population consisted of students from the aforementioned universities who voluntarily responded to the questionnaire, limited to the age range of 18–24 years.

Descriptive analysis was performed using measures of central tendency and dispersion for quantitative variables, as well as frequency distributions for qualitative variables. To evaluate differences between groups according to gender and reading information about SC and tanning on SM, the χ^2 test was applied for independent qualitative variables, while the Student *t* test was applied for independent quantitative variables. The level of statistical significance was set at $P < .05$.

Multivariate logistic regression models were developed, taking as outcome variables the presence of sunburn in the previous year and agreement with the statement "tanned people are more attractive," and including variables related to sociodemographic characteristics, skin type, habits, attitudes, and knowledge. Variables were selected using the forward stepwise method, with a significance criterion set at $P < .05$, and odds ratios with corresponding 95%CIs were described. SPSS version 28 software was used for statistical analysis and GraphPad Prism 8.4.0 for graphical representation.

Results

Sample characteristics

Of 973 responses received, 282 (29%) were discarded: 125 because respondents were outside the established age range and 157 because respondents did not answer the item on presence of sunburns in the previous year. The study sample consisted of 691 university students, with a predominance of women (73.3%) and students from social and legal sciences (55%) and health sciences (30.4%). A total of 55.1% reported a very light or light natural skin color, and 20% reported a reactive skin type I or II (Table 1).

Overall, a total of 92.9% of the sample connected to Instagram at least once a day, 52.8% to TikTok, and 46.3% to Twitter.

A total of 75.2% had read about SE risks on at least 1 SM platform, primarily Instagram (59.8%), followed by TikTok (45.9%) and Twitter (38.9%). This was more frequent among women on Instagram (63.3%) and less frequent among men on TikTok (30.3%). A significant difference was observed between women and men in the visualization of information about SE risks on TikTok (Table 2).

Health beliefs about skin cancer and knowledge about sun exposure

A total of 83.1% had read about tanning in general on at least 1 SM platform, primarily Instagram (76.7%), followed by TikTok (63.0%) and Twitter (42.6%). Among women, 81.7% had seen messages about tanning on Instagram. A significant difference was observed between women and men in the visualization of messages about tanning on at least 1 social media platform, Instagram, and TikTok (Table 2). More than 90% agreed on the severity of SC and the effectiveness of sun protection, especially women. However, agreement decreased for items such as "it is easy to effectively protect oneself from sun exposure" (67.4%) and "I have experiences, tips, etc., that serve as a guide for me to protect myself from sun exposure" (68.6%) (Supplementary Table 1).

Seven of the 10 questions about knowledge of SE had a success rate >80%, whereas 3 had a success rate of ≤30%. Greater knowledge was found among women, both in the evaluation of individual items (C1, C6, and C7) and in the comparison of the total knowledge score, which was 0.3 points higher among women (Supplementary Table 2).

Attitudes toward sun exposure and according to having read messages about sun exposure risks and tanning on at least 1 social media platform

Supplementary Table 3 evaluates the degree of agreement with 14 statements about SE. In 3 items about sunscreen use, more than 90% agreed (A10, A11, and A14, with the item evaluated positively). Up to 10 items showed significant differences by gender, with a higher degree

Table 1
Sociodemographic characteristics and skin type.

	Total (n = 691)	
	n	%
Sex[a]		
Male	184	26.7
Female	504	73.3
Age, mean (SD), y	20.1	1.5
Country of birth[b]		
Spain	638	93.3
Foreign country	46	6.7
Study cycle		
Undergraduate degree	638	98.8
Postgraduate degree	8	1.2
Degree program, by field of knowledge		
Arts and Humanities	40	5.8
Sciences	21	3.0
Health Sciences	210	30.4
Social and Legal Sciences	380	55.0
Engineering and Architecture	40	5.8
Natural skin color		
Very light/light	381	55.1
Intermediate/brown	310	44.9
Reactive skin type		
I. I get a painful sunburn the next day and do not tan after 1 week.	37	5.4
II. I get a painful sunburn the next day and a light tan after 1 week.	101	14.6
III. I get a mild sunburn the next day and tan moderately after 1 week.	378	54.7
IV. I do not get sunburned the next day and tan intensely after 1 week.	175	25.3

SD, standard deviation. Frequency of social media use and visualization of messages on sun exposure risks and tanning.
[a] Three people identified themselves as nonbinary.
[b] Data missing for 7 participants.

Table 2
Visualization of messages on SE risks and tanning in general.

	Total (n = 691)		Men (n = 184)		Women (n = 504)		*P* value
	n	%	*n*	%	*n*	%	
Have you read information about the risks of sun exposure on social media? Frequency and percentage of affirmative responses are shown.							
Twitter[1]	244	38.9	72	46.2	170	36.3	$P = .037$
Instagram[2]	380	59.8	78	49.4	300	63.3	$P = .003$
TikTok[3]	288	45.9	47	30.3	240	51.1	$P < .001$
At least 1 platform[4]	478	75.2	106	66.7	370	78.1	$P = .006$
Have you read information about tanning on social media? Frequency and percentage of affirmative responses are shown.							
Twitter[5]	265	42.6	66	42.9	197	42.4	$P = .99$
Instagram[6]	482	76.7	95	60.5	385	81.7	$P < .001$
TikTok[7]	394	63.0	66	42.9	327	69.9	$P < .001$
At least 1 platform[8]	527	83.1	111	70.3	414	87.5	$P < .001$

Missing data: [1]64; [2]56; [3]63; [4]55; [5]69; [6]60; [7]66; [8]57. Health beliefs about skin cancer and knowledge about sun exposure.

of agreement among women in 8 of them (A2, A4, A5, A6, A7, A8, A10, and A11), related to sun-related behaviors, tanning, and sunscreen use, compared with 2 items among men (A3, related to sun-related behavior, and A12, related to sun protection behavior).

Regarding having read information about SE risks on at least 1 SM platform and its relationship with attitudes, no differences were observed between those who had read this information and those who had not (Fig. 1). However, “sunbathing improves my mood,” “clothes look better on me when I am tanned,” and “tanned people are more attractive” were attitudes with greater acceptance among people who had read some message about tanning on at least 1 SM platform (Fig. 2).

Sun exposure habits, sunburns, and photoprotectionTable 3 shows SE habits in the overall sample and by gender. Sunbathing, whether at a pool, beach, or solarium, was the most frequent scenario, with 51.7% of respondents reporting 30 or more days per year and 62.8% reporting 3 or more hours of exposure. Men had greater exposure in terms of days spent doing sports or leisure activities, 26.9% more than women, and at workplaces, 9.6% more than women.

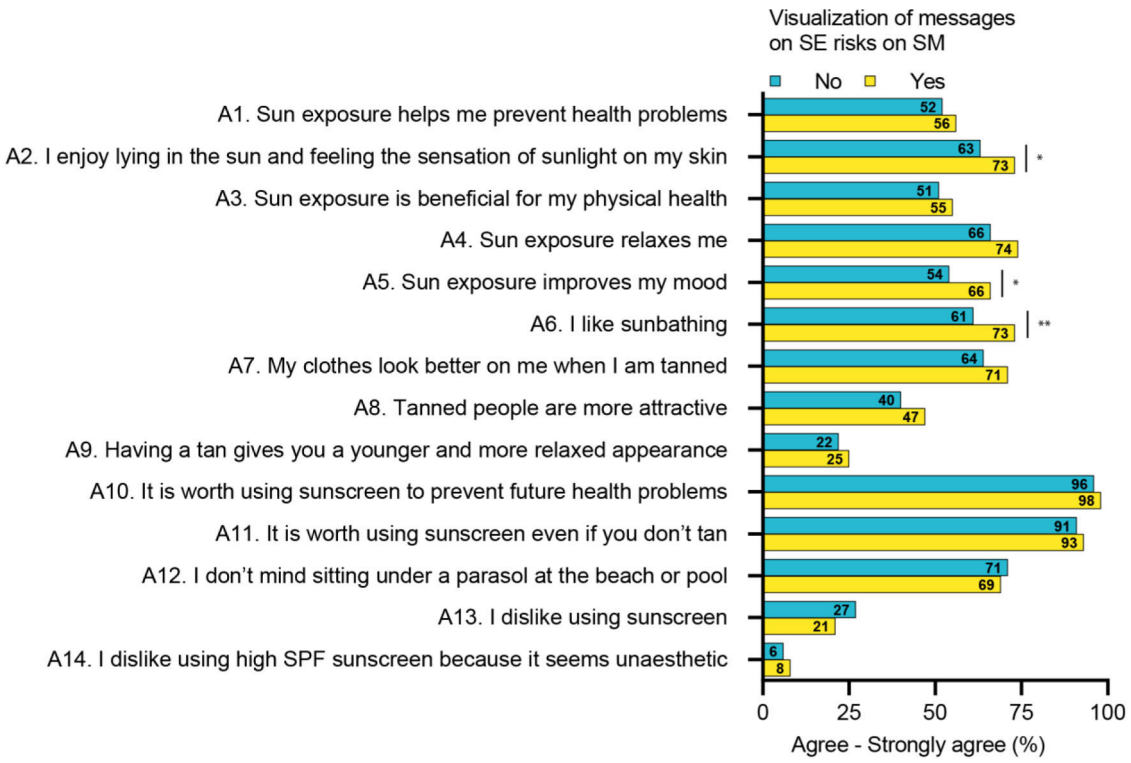

Fig. 1. Relationship between attitudes and having seen messages about SE risks on SM. $^{*}P < .05$; $^{**}P < .01$, χ^2 test.

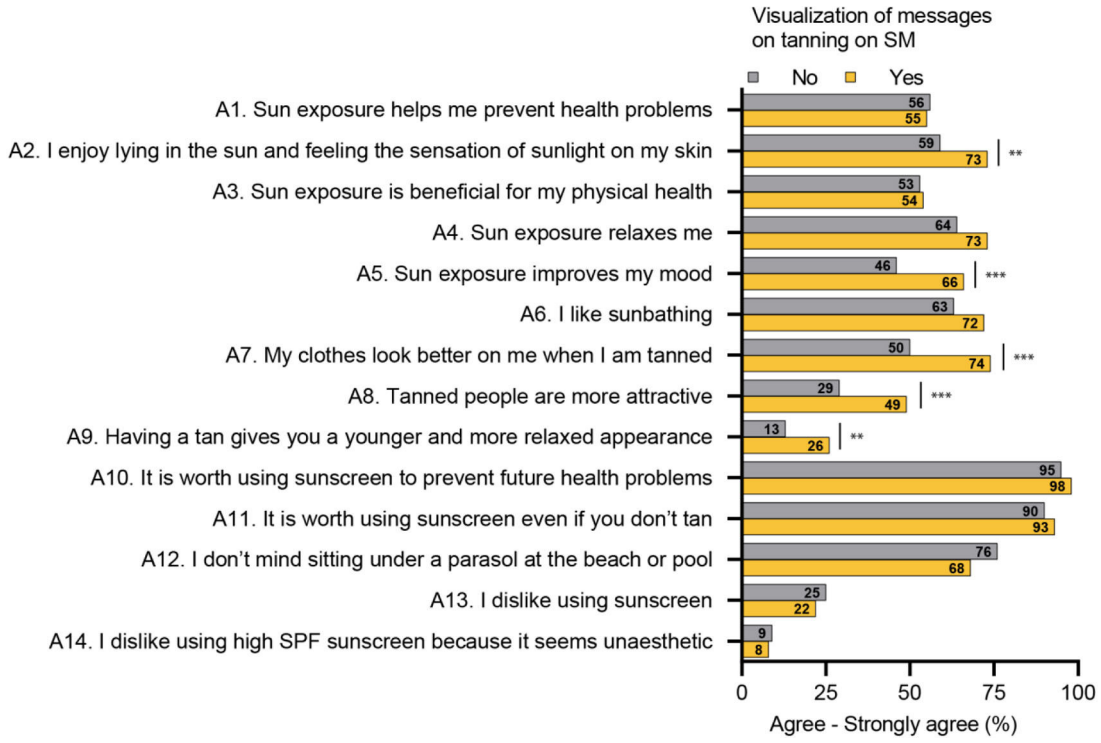

Fig. 2. Relationship between attitudes and having seen messages about tanning on SM. $^{**}P < .01$; $^{***}P < .0001$, χ^2 test.

Overall, 86.7% of respondents had experienced at least 1 sunburn in the previous year, predominantly in coastal areas (86.5%).

Sunscreen was the most frequent protection practice (72.7%), with a significant difference of 18.3% in favor of women. No other practice, including avoiding midday hours, seeking shade, wearing long clothing, hats, or sunglasses, exceeded 50% in frequency, although avoiding midday hours was 9.3% more common among men. Lack of knowledge about sunscreen SPF was greater among men (10.5%) than among women (1.2%).

Table 3
SE habits, sunburns, and photoprotection.

	Total (n = 691)[a]		Men (n = 184)		Women (n = 504)		P value
	n	%	n	%	n	%	
Days per year of sun exposure while doing outdoor activities: ≥30 days							
Pool, beach, or solarium	357	51.7	85	46.2	271	53.8	.094
Sports or leisure activities[1]	391	42.2	113	61.7	175	34.8	<.001
Work[2]	84	12.2	35	19.1	48	9.5	.001
Hours per day of sun exposure while doing outdoor activities: ≥3 h							
Pool, beach, or solarium[3]	433	62.8	90	49.2	341	67.7	<.001
Sports or leisure activities[4]	269	39.0	63	34.2	204	40.6	.157
Work[5]	134	19.5	45	24.6	88	17.5	.050
Sunburn in the previous year							
None	92	13.3	26	14.1	64	12.7	
1–2	333	48.2	88	47.8	245	48.6	
3–5	196	28.4	49	26.6	146	29.0	.715[b]
6–10	53	7.7	17	9.2	36	7.1	
>10	17	2.5	4	2.2	13	2.6	
Sunburn by area[6]							
Inland area	92	13.5	31	17.0	59	11.9	.105
Coastal area	588	86.5	151	83.0	437	88.1	
Sun protection practices: usually/always							
I seek shade/use a parasol[7]	307	44.9	89	48.9	216	43.3	.224
I wear sunglasses[8]	256	37.4	59	32.4	197	39.5	.111
I wear a hat or cap[9]	94	13.8	32	17.7	61	12.3	.092
I wear a short-sleeved or long-sleeved T-shirt and long pants[10]	48	7.0	17	9.3	29	5.8	.145
I avoid midday hours[11]	195	28.6	64	35.4	131	26.3	.026
I use sunscreen[12]	498	72.7	108	59.3	388	77.6	.001
Commonly used SPF[13]							
I do not know	27	4.0	19	10.5	6	1.2	
2–10	3	0.4	1	0.6	2	0.4	
15–20	50	7.3	15	8.3	35	7.0	<.001
30–50	345	50.5	81	44.8	263	52.7	
>50	258	37.8	65	35.9	193	38.7	

Missing data: [1]2; [2]2; [3]1; [4]1; [5]4; [6]11; [7]7; [8]7; [9]10; [10]6; [11]8; [12]8; [13]8. Determinants associated with the presence of sunburn in the previous year and positive attitude toward tanning.

[a] Including 3 individuals who identified as nonbinary and were therefore excluded from the gender-stratified analysis.

[b] Absence vs presence of sunburn was compared.

Determinants associated with the presence of sunburn in the previous year and positive attitude towards tanning

Adjusted for skin phototype, intense exposure of 3 or more hours while practicing outdoor sports or leisure activities (OR, 1.92; 95%CI, 1.11–3.32) was identified as a variable that increased the risk of sunburn, as was agreement with the attitude "tanned people are more attractive." At the same time, the habitual practice of avoiding midday hours (OR, 0.46; 95%CI, 0.24–0.73) was identified as a protective factor against sunburn, as was agreement with the attitude "sunbathing improves my mood" (OR, 0.41; 95%CI, 0.24–0.73) (Table 4).

Using the same multivariate methodology, variables related to a positive attitude toward tanning were explored, specifically agreement with the statement "tanned people are more attractive." Being female (OR, 1.89; 95%CI, 1.26–2.82), having read messages about tanning on SM (OR, 1.88; 95%CI, 1.16–3.05), and other positive attitudes toward tanning were identified as associated variables. In contrast, the habitual practices of seeking shade or using a parasol (OR, 0.46; 95%CI, 0.33–0.66) and avoiding midday hours (OR, 0.61; 95%CI, 0.41–0.90) were included in the equation, as was knowledge (Supplementary Table 4).

Discussion

This study is the first in Europe to investigate the relationship between SM use, tanning preferences, and the incidence of sunburns in young adults as potential risk factors for SC.

Sun protection habits were deficient, characterized by a highly favorable attitude toward and very frequent use of sunscreens, with these findings being more prominent among women. There is evidence of inadequate practice of other photoprotection measures that may be considered more effective, such as seeking shade and wearing appropriate clothing.[27]

Sunscreens are considered by most respondents to be the best way to protect against sun exposure and prevent SC, but the high rates of sunburn call into question the proper use and application of these products. They may also be used to prolong SE.[8]

Sunburns in the previous year, especially in coastal regions, are concerning. These results are consistent with those of other recent studies in similar populations from various geographic areas: Las Palmas de Gran Canaria[28] and Aragón[29] in Spain, Denmark,[30] the United States,[9] and Ecuador.[31]

Having skin type I to III, intense sports practice, outdoor leisure activities, and a high degree of agreement with the statement "tanned

Table 4
Summary of the multivariate logistic regression model for reported presence of sunburn in the previous year.

Variables in the equation	β	*P* value	OR	95%CI, lower	95%CI, upper
Reactive skin type		<.001			
I			1.00		
II	1.69		5.39	3.06	9.51
III	1.50		4.49	1.88	10.74
IV	0.93		2.53	0.88	7.27
Sports or outdoor leisure activities, average daily activity					
<3 h			1.00		
≥3 h	0.65	.020	1.92	1.11	3.32
I avoid midday hours, 12:00 PM to 4:00 PM					
Never/almost never/sometimes			1.00		
Usually/always	−0.79	.003	0.46	0.27	0.77
Sunbathing improves my mood					
Strongly disagree/disagree/indifferent			1.00		
Agree/totally agree	−0.88	.002	0.41	0.24	0.73
Tanned people are more attractive					
Strongly disagree/disagree/indifferent			1.00		
Agree/totally agree	0.70	.012	2.01	1.17	3.45

OR, odds ratio; 95%CI, 95% confidence interval.

people are more attractive" influenced having experienced sunburn in the previous year. Approximately half of the sample expressed a high degree of agreement with this item, and an even higher proportion considered that clothes looked better on them with tanned skin, consistent with the results observed among medical students.[28] This positive attitude toward tanning was more common among women.

Agreement with the statement about the attractiveness of tanned people was influenced by being female and by having read messages about tanning on SM. A large proportion of women confirmed having done so, especially on Instagram and TikTok. These results are concerning: these platforms are associated with health problems related to body image dissatisfaction, especially in young women.[32,33]

On the other hand, "avoiding midday hours" and "seeking shade" were associated with a lower preference for tanning and were more common practices among men. This would imply a lower sunburn rate, but this was not the case. Their lack of knowledge about the risks of SE and their low concern about SC should be highlighted. Additionally, outdoor sports, practiced on more days per year by men than women in our sample, have been associated with a higher risk of SC.[34]

Previous studies state that the use of SM can increase the practice of artificial tanning with sunbeds.[12] Other studies suggest that the same relationship exists between these platforms and the preference for tanning.[10,14,16] The findings of the present study corroborate the results of previous research.

Furthermore, we identified key aspects for designing future educational interventions on SM aimed at this target population to improve SE-related behaviors and reduce the preference for tanning. Likewise, the differences between genders are valuable for appropriately connecting with different target audiences.

Conclusions

The high rate of sunburns highlights the magnitude of SC risk and the need for efficient strategies targeting university students to improve their SE habits. Our study reveals significant differences between men and women in terms of SE and photoprotection behaviors, attitudes, and knowledge.

We highlight the higher percentage of women who confirmed having read messages on SM about SE risks and tanning in general, showing a worryingly positive attitude toward tanning. In contrast, men experienced greater SE while practicing sports and outdoor activities throughout the year, showed less concern about SC risk, and were less accessible through SM.

Reducing the desire for tanning and SE time, and improving photoprotection measures other than sunscreen, should be the main messages of future campaigns aimed at this population in terms of SC prevention.

Limitations of the study

The main limitation of the study is the overrepresentation of women. This could affect the generalizability of preventive messages to a more heterogeneous audience on SM. However, the results are significant for a target population of female university students aged 18–24 years. Additionally, there is a constant increase in the percentage of female graduates compared with men, and, depending on the degree, women may be more highly represented.[35]

The use of a self-completed survey implies that responses may be conditioned by the degree of understanding of the questions. The length of the questionnaire reduced the response rate, especially in the final part. The social media block received the fewest responses.

Declaration of generative AI and AI-assisted technologies in the writing process

During the preparation of this work, the author(s) used Gemini to improve the wording. After using this tool/service, the author(s) reviewed and edited the content as needed and take full responsibility for the content of the publication.

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Conflicts of interest

None declared.

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Appendix A. Supplementary data

Supplementary data associated with this article can be found in the online version available at https://doi.org/10.1016/j.ad.2026.104715.

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