Factors Associated with Non-Regular Use of Sunscreens in Southern Brazil

Sasso S*

University of Extreme Southern Brazil, Brazil

*Corresponding author: Sergio Sasso, University of Extreme Southern Brazil, Rua Fernando Zanata, 234. Criciuma – SC, Brazil, Tel: 4834374111; Email: ses@unesc.net

Abstract

Introduction: The southern region of Brazil leads the statistics of skin cancer in Brazil, and multiple factors are related to this predisposition, such as low phototypes and excessive sun exposure. Ultraviolet radiation is the main modifiable risk factor for melanoma and non-melanoma skin cancer, and the regular use of sunscreens has been shown to be effective in reducing the risk of developing these diseases, as well as other photomediated dermatoses. Despite this, the prevalence of non-regular use of sunscreens in cities in Paraná and Rio Grande do Sul proved to be above the desired level. In Santa Catarina cities, this prevalence was still undetermined.

Objective: To identify the prevalence of non-use of sunscreen regularly and relate it to demographic, socioeconomic, behavioral and health variables.

Method: A population-based cross-sectional study carried out in 2019 with individuals aged 18 years or older residing in the urban area of a large municipality in southern Brazil. Crude and adjusted analyzes were performed, using Poisson regression with a significance level of 5%, to assess the association between non-regular use of sunscreen and sociodemographic, behavioral and health variables.

Results: 820 individuals were studied. The prevalence of not using sunscreen regularly was 52.8%. Factors associated with increased risk were: male sex (PR 1.57; 95%CI 1.39-1.77); smoking (PR 1.19; 95%CI 1.03-1.37); age, showing a direct linear trend; and schooling, showing an inverse linear trend. Having a supplementary health plan (PR 0.84; 95%CI 0.71-0.99) and walking during leisure time (PR 0.76; 95%CI 0.64-0.90) proved to be protective factors.

Conclusion: This study allowed us to identify the profile of individuals at greater risk of not using sunscreen regularly and who, consequently, are at greater risk of developing photo-related skin diseases. It represents a potential benefit to public health insofar as it allows better targeting of prevention strategies.

Keywords: Sunscreens; Skin cancer; Melanoma; Ultraviolet radiation

Abbreviations: UV: Ultraviolet Radiation; NMSC: Non-Melanoma Skin Cancer; INCA: National Cancer Institute; PMAQ-AB: National Program for the Improvement of Access and Quality of Primary Care; PR: Prevalence Ratios.

Introduction

The different waves that make up solar radiation are essential to the life cycle of many living beings, as they

participate in important photochemical and photobiological reactions [1]. Despite this, since 1992, based on studies by the *International Agency for Research in Cancer* (IARC), it has been known that ultraviolet radiation (UV) is carcinogenic in humans [2] and, since 2012, there is sufficient evidence that UVR causes cancer. of the skin [3].

Non-melanoma skin cancer (NMSC) is the cancer with the highest incidence in the world [4]. In Brazil, the National Cancer Institute (INCA) estimate for the year 2020 was 177 thousand new cases, with the southern region of Brazil leading the national ranking, with the state of Santa Catarina occupying the second position. Regarding the incidence of melanoma, Santa Catarina was the absolute leader [5]. With a lethality rate of up to 30% in Brazil [6]. Cutaneous melanoma represents the main cause of death in dermatology worldwide.

UVR is the main known environmental risk factor for the development of melanoma and non-melanoma skin cancer [7], which reinforces the role of photoprotectors in the prevention of skin cancer. The risk is higher in fair-skinned people, such as those of European descent [7-9], widely found in Criciúma (SC) [10].

Despite this, most people do not seem to make regular use of sunscreens. Studies in cities with demographic characteristics similar to those of Criciúma (SC), such as Rio Grande (RS) [11] and Pelotas (RS) [12] showed a prevalence of non-regular use of sunscreens of 39.2% and 38.2%, respectively.

Multiple factors have been related to the habit of not using sunscreen regularly, whether these are socioeconomic, cultural or behavioral factors [12-16]. Identifying the prevalence of non-use of sunscreens in the city of Criciúma (SC), as well as identifying the variables that are associated with this behavior, is essential for the development of strategies that aim to reduce the numbers of skin cancer, especially in this region. Thus, the objective of this study is to evaluate the association between non-use of sunscreens and sociodemographic, behavioral and health characteristics in adults and the elderly.

Method

This is a population-based cross-sectional study carried out in Criciúma (SC), a city with about 219,000 inhabitants and located in the southern region of the State of Santa Catarina, it is only 22 km from the coast and has an average UV index of 5 [17]. Colonization was initially carried out by Italian, Portuguese and Polish immigrants [10], that is, light-skinned Europeans. The city is geographically positioned at 28° South Latitude, a position it shares with part of Australia,

a country with a high incidence of skin cancer [18]. This study was carried out with data from the Saúde da Populacao Criciumense survey, developed from March to December 2019 and which provided detailed information about the health of citizens. Adults and elderly individuals living in the urban area of Criciúma (SC) were included. Those who were unable to respond and/or complete the interview due to physical or cognitive impairment were excluded. The sample was obtained based on the 2010 Demographic Census in two stages. In the first, all 306 census sectors in Criciúma (SC) that were located in the urban area of the municipality and owned private properties were considered. Of these, 77 (25%) were randomly selected. In the second stage, for the selection of households within the selected sectors, 618 were systematically selected, whose residents aged 18 or over were invited to participate in the study. Data collection took place from March to December 2019 and all interviewers were trained to apply the research instrument. The interviewers were made up of scientific initiation scholarship holders and multi-professional residents. The questionnaires were previously tested by the interviewers to clarify doubts and monitor the application time. Each interviewer also received a researcher manual, where each survey question was explained in detail. The selected households were identified at the time of data collection and the interviewers invited all resident adults (18 years or older) to participate in the survey. A field supervisor was responsible for moving the interviewers and monitoring the research and work of the interviewers in the field. As an instrument for data collection, a questionnaire was used with an average application time of 50 minutes and with questions about sociodemographic, behavioral, anthropometric and health data, developed and applied by previously trained interviewers. After being collected, the data were reviewed by the field supervisor and coded by the interviewers. This questionnaire was unique, standardized and pre-coded. For the present study, 20 questions of the instrument described were analyzed.

For the collection of data referring to the dependent variable, the interviewee should answer whether he used to use sunscreen, having three answer options: 1. Yes, throughout the year; 2. Yes, only in summer; 3. No. For the construction of the outcome variable (non-regular use of sunscreens) the response options "Yes, only in the summer" and "No" were considered. The independent variables were gender (male or female), age (collected in complete years and categorized as 18-29, 30-59 and 60 or more), skin color (white, brown, black), education level (collected in complete years and categorized into 0-4, 5-8, 9-11 and 12 or more), monthly income (categorized into <500, 500-1000, 1001-2000, 2001-4000 and > 4000 reais), paid work (yes or no), smoking (yes or no), household registered in a primary health care unit (UAPS), such as a Basic Health Unit (UBS) or a Family Health Strategy (ESF) (yes or no), access a

supplementary health plan (yes or no), preventive medical consultation in the last 12 months (yes or no), preventive dental consultation in the last 12 months (yes or no), practice of walking in spare time (yes or no), walking (yes or no), cycling (yes or no), sufficient physical activity (>=150 min/week) (yes or no), history personal cancer of any organ (yes or no) and personal history of skin cancer (yes or no).

The data obtained were double-entered in EpiData software version 3.1 and analyzed using IBM SPSS software version 22.0. Descriptive analyzes of all the variables studied were performed, through the presentation of absolute (n) and relative (%) frequencies. Crude and adjusted analyzes of the association between non-regular use of sunscreen and the independent variables were performed using Poisson regression with robust variance and a 5% significance level. Prevalence ratios (PR) and their respective 95% confidence intervals were presented. The p-value presented corresponds to the Wald test for heterogeneity or linear trend. For the adjusted analysis, a hierarchical model was constructed and the independent variables that presented $p<0.20$ were considered as possible confounding factors. At the first (most distal) level, demographic variables (sex, age, skin color) were included; at level 2, sociodemographic factors were included (education, paid work, monthly income); level 3 was composed of variables related to health care (supplementary health plan, household registered in primary health care units); at level 4, variables related to health care and early

diagnosis (preventive medical consultation, preventive dental consultation) were included. Finally, at the most proximal level, behavioral factors and other health-related factors (smoking, sufficient physical activity, walking in leisure time, walking, cycling, personal history of skin cancer, personal history of other types of cancer).

Results

A total of 820 individuals aged 18 years and over (86.1% response rate) were studied. The characteristics of the studied sample can be seen in Table 1. Most respondents were female (63.8%), were 60 years of age or older (45.0%), white skinned (82.5%), had up to 8 years of schooling (53.6 %), monthly income between 1,001 and 2,000 reais, and was not employed (64%). Most individuals reported that their household is registered in some UBS (94.6%) and that they do not have a supplementary health plan (72.0%). Regarding preventive consultations, more than half of the interviewees reported not having had a medical (58.8%) or dental consultation (58.2%) in the last year. As for the physical activity variables, one third of the interviewees walked in their free time (30.0%) and 25.1% of them performed enough physical activity. When asked about the means of transportation, 64.2% said they did it on foot, while 5.4% used a bicycle. It could also be observed that 1.5% of the interviewees stated that they had already had skin cancer, while 5.5% had already had cancer of another nature.

Variable	no	%
Sex		
Male	297	36.2
Feminine	523	63.8
Age (in years)		
18-29	101	12.3
30-59	350	42.7
60 or more	369	45
Skin color*		
White	660	82.5
Black	49	6.1
Brown	91	11.4
Education (in years)		
0-4	219	26.7
05-Aug	220	26.9
09-Nov	266	32.5
12 or more	114	13.9
Monthly income (in reais)		
<500	151	19
500-1000	166	20.9
1001-2000	248	31.2

2001-4000	164	20.6
>4000	66	8.3
Paid work		
No	523	64
Yes	294	36
Smoke		
No	702	85.6
Yes	118	14.4
Registration in UAPS		
No	42	5.4
Yes	741	94.6
Health plan		
No	590	72
Yes	229	28
Preventive medical consultation		
No	468	58.8
Yes	328	41.2
Preventive dental consultation		
No	458	58.2
Yes	329	41.8
Walk in your free time		
No	572	70
Yes	245	30
Walks for displacement		
No	289	35.8
Yes	518	64.2
Bike for commuting		
No	773	94.6
Yes	44	5.4
Enough physical activity		
No	611	74.9
Yes	205	25.1
Skin cancer history		
No	808	98.5
Yes	12	1.5
History of cancer of other organs		
No	775	94.5
Yes	45	5.5
No regular use of sunscreen		
Yes	433	52.8
No	387	47.2

Table 1: Distribution of the sample of adults and elderly individuals. Criciúma, SC, Brazil, 2019 (n=820).
UAPS: Primary Health Care Unit.
Variable with the greatest loss of data: household registered in UAPS (n =37; 4.5%).
*Indigenous and yellow people were excluded (n=20).

Sasso S. Factors Associated with Non-Regular Use of Sunscreens in Southern Brazil. Clin
Dermatol J 2022, 7(4): 000287.

Copyright© Sasso S.

The prevalence of not using photoprotectors was 52.8%. Table 2 expresses the crossing between the independent variables and the outcome variable. In the crude analysis, the non-use of sunscreens was higher among men, individuals over 60 years of age, black, with a lower level of education (0 to 4 years) and with a monthly income between R$ 1,001.00 and BRL 2,000.00. The same behavior was observed among smokers, those who were not employed, those who did not have health insurance, as well as those whose domicile was registered in a UBS and those who had not had a medical or dental appointment in the last year. Those who do not walk in their free time and who do not travel on foot or by bicycle, as well as those who do not practice enough physical activity, also had a higher prevalence of the outcome studied. Likewise, individuals who have never had skin cancer and those who have had cancer of another nature had a lower prevalence of photoprotection. After adjusting for possible confounding factors, the variables gender, age, education, smoking, health insurance and walking during leisure time remained associated with the outcome. Males were 57% more likely (PR: 1.57; 95%CI 1.39-1.77) of not making regular use of sunscreens compared to women. The non-use of sunscreen was 62% more frequent among individuals over 60 years of age (PR: 1.62; 95%CI 1.26-2.09), with a direct linear trend between age group and outcome. The level of education was inversely related to the outcome, that is, the higher the level of education, the lower the prevalence of non-regular use of sunscreen (p<0.001). In addition, smokers were 19% more likely (PR: 1.19; 95%CI 1.03-1.37) not to use sunscreen regularly compared to non-smokers. Having a supplementary health plan was associated with a lower prevalence of non-use of sunscreen regularly (PR: 0.84; 95%CI 0.71-0.99). Furthermore, individuals who walk in their free time were 24% less likely to not use sunscreen regularly (PR: 0.76; 95% CI 0.64-0.90).

Variables	% of non-use of sunscreen	raw analysis		Adjusted analysis**	
		RP (95%CI)	Value p*	RP (95%CI)	Value p*
Sex			<0.001		<0.001
Male	68.7	1.57 (1.39-1.78)		1.57 (1.39-1.77)	
Feminine	43.8	-		-	
Age (in years)			<0.001st		<0.001st
18-29	39.6	-		-	
30-59	45.1	1.14 (0.87-1.49)		1.16 (0.89-1.52)	
60 or more	63.7	1.61 (1.25-2.07)		1.62 (1.26-2.09)	
Skin color			0.302		0.308
White	50.9	-		-	
Black	73.5	1.44 (1.20-1.74)		1.49 (1.24-1.80)	
Brown	53.8	1.06 (0.86-1.30)		1.05 (0.86-1.27)	
Education (in years)			<0.001 to		<0.001 to
0-4	64.8	1.90 (1.44-2.49)		1.57 (1.16-2.13)	
05-Aug	58.2	1.70 (1.29-2.25)		1.49 (1.11-2.00)	
09-Nov	46.6	1.36 (1.02-1.81)		1.27 (0.94-1.71)	
12 or more	34.2	-		-	
Monthly income (in reais)			0.631		0.205
<500	46.4	-		-	
500-1000	52.4	1.13 (0.90-1.42)		0.94 (0.75-1.17)	
1001-2000	57.7	1.24 (1.02-1.52)		0.99 (0.81-1.22)	
2001-4000	54.3	1.17 (0.94-1.46)		0.89 (0.71-1.12)	
>4000	42.4	0.92 (0.66-1.27)		0.81 (0.58-1.11)	
Work			0.008		0.557

Sasso S. Factors Associated with Non-Regular Use of Sunscreens in Southern Brazil. Clin Dermatol J 2022, 7(4): 000287.

Copyright© Sasso S.

No	56.2	-		-	
Yes	46.3	0.82 (0.71-0.95)		0.95 (0.81-1.12)	
Smoke			0.011		0.021
No	51.1	-		-	
Yes	67.2	1.23 (1.05-1.43)		1.19 (1.03-1.37)	
Registration in UAPS			0.141		0.446
No	40.5	-		-	
Yes	53.6	1.32 (0.91-1.92)		1.16 (0.82-1.65)	
Health plan			0.001		0.044
No	56.8	-		-	
Yes	42.4	0.75 (0.63-0.88)		0.84 (0.71-0.99)	
Preventive medical consultation			0.151		0.146
No	54.9	-		-	
Yes	49.7	0.90 (0.79-1.04)		0.91 (0.80-1.03)	
Preventive dental consultation			0.482		0.878
No	52.4	-		-	
Yes	49.8	0.95 (0.83-1.09)		0.99 (0.87-1.13)	
Walk in your free time			<0.001		0.001
No	57.3	-		-	
Yes	42.4	0.74 (0.63-0.87)		0.76 (0.64-0.90)	
walks for displacement			0.003		0.201
No	60.2	-		-	
Yes	49.4	0.82 (0.71-0.92)		0.92 (0.82-1.04)	
Bike for commuting			0.106		0.295
No	53.4	-		-	
Yes	40.9	0.77 (0.53-1.10)		0.82 (0.57-1.19)	
Enough physical activity			<0.001		0.139
No	57.1	-		-	
Yes	40	0.70 (0.58-0.84)		0.87 (0.71-1.05)	
Skin cancer			0.132		0.076
No	53.2	-		-	
Yes	25	0.47 (0.18-1.26)		0.41 (0.15-1.10)	
Cancer of other organs			0.696		0.706
No	52.6	-		-	
Yes	55.6	1.06 (0.81-1.38)		0.95 (0.74-1.22)	

Table 2: Crude and adjusted analysis of the association between non-use of sunscreen and the exposure variables studied. Criciúma, SC, Brazil, 2019 (n=820).
UAPS: Primary Health Care Unit. PR: prevalence ratio.
* Poisson regression
**Poisson regression adjusted for the variables in this table considering the hierarchical levels of determination.
[a] Wald test for linear trend.

Discussion

The present study, which aimed to assess the prevalence and factors associated with the non-use of sunscreen in a population-based study in Brazil, brings important results on the high occurrence of the outcome and its main risk factors, contributing to public health Brazilian. The non-use of sunscreens, mentioned by more than half (52.8%) of the analyzed sample, corroborates Olsen, et al. (2018), when they state that this frequency is high even in regions with the highest incidence of sunlight [8]. In Pelotas (RS), the observed prevalence was 39.8% at the beach, 69.8% during the practice of outdoor sports, and 86.3% during the working day [12], showing that sunscreens still do not work. part of the daily life of most citizens, especially during the working day. This statement is corroborated by the research by Cardoso, et al. (2017), where two-thirds of the participants (65.8%; 95%CI: 59.8 – 71.8) also reported not using sunscreen during that period [19]. Silva and Dumith (2019), in a research carried out in Rio Grande (RS) found the lowest prevalence of the outcome, that is, 38.2% (95%CI: 34.6 - 41.8) [11], possibly because the mentioned research was carried out in a coastal city, where a higher degree of photoprotection is naturally expected. The prevalence of non-regular use of sunscreens found in the present study (52.8%) is a considerably high value, taking into account that, according to INCA data, Santa Catarina is the national leader in the incidence of melanoma and vice-leader in the incidence of melanoma. non-melanoma skin cancer and that the regular use of sunscreens has already been shown to be highly effective in preventing photo-related diseases, from simple extrinsic aging – induced by solar radiation – to cutaneous melanoma [8,20-22].

When analyzing the association between the outcome and the variables studied, and comparing with the results of other studies, we observed that the higher prevalence of non-use of sunscreens in men is in line with the findings of several authors [11,12,23-25], confirming that men are more likely to not use sunscreens. The analysis of human behavior performed by Griffith, et al. (2016) showed that men actually present more health risk behaviors [26], which McKenzie, et al. (2019) related to sexist behavior [27]. In leisure activities such as spas or swimming pools, the habit of not wearing a shirt and not having long hair protecting the neck and back against the sun's rays favor the appearance of melanomas in these body segments. As most of the manual work positions and those exposed to the sun (civil construction, agriculture, fishing, among others) are occupied by male individuals (additionally with low income and low level of education) [28-30], the need to address this issue more intensively with this group.

Regarding age, a direct linear trend with the outcome was identified in the studied sample, that is, the higher the age group, the greater the prevalence of non-use of sunscreen, revealing that, in the city of Criciúma (SC), the age is an independent risk factor for not using sunscreen, and that the elderly are 62% more likely than younger ones. Silva and Dumith (2019), in a population-based study, found the same association between these variables [11]. Other studies have also verified that elderly individuals have a lower prevalence of sunscreen use [15,23,31]. Possible explanations include the fact that, according to Holman, et al. (2019), the elderly prefer alternative photoprotection measures, such as wearing long clothes, wearing hats and walking in the shade [15]. The non-regular use of sunscreens by older individuals may also be related to the few hours of outdoor activities practiced by the elderly population, a reflection of the domestic isolation to which they are often subjected [32]. Additionally, it is known that older individuals have less autonomy over their needs, whether due to limited vision, motor skills or cognitive issues, often depending on third parties, including for their self-care activities [32-34]. Given the multiplicity of variables that can affect the usability of sunscreens by the elderly population, additional studies aimed at this group are needed to better assess their interaction with these products.

Another result found in the present study was the inverse linear association with the education variable, which is corroborated by the findings of several authors [11,23,25,31-35]. In this way, it is evident that the non-use of sunscreen is greater in individuals with a lower level of education, postulating that a lower level of education is associated with a lower knowledge about photoprotection and a lower level of understanding about the harmful effects of exposure, excessive sun exposure. Similarly, a low level of education is also associated with other behaviors that denote a reduced sense of self-preservation, such as smoking and excessive alcohol consumption [19]. Furthermore, there is a natural tendency for individuals with a low level of education to be absorbed by the manual labor sectors of the labor market, including activities exposed to the sun, as previously discussed [28-30].

The direct association between smoking and non-use of sunscreen, rarely addressed in the scientific literature, could be confirmed in the present study, showing that individuals who smoke are 19% more likely to not use sunscreen. It is known, according to data from the 2020 Vigitel, that smoking is more prevalent in males and that, according to data from this study and corroborated by the literature, men are more likely not to use sunscreen [11,12,23-25]. However, the multivariate analysis maintained smoking associated with the outcome independently of sex. The hypothesis about this association comes from the particular belief that both the habit of smoking, associated with the outcome, and the habit of not protecting the skin from the harmful rays of the

Sasso S. Factors Associated with Non-Regular Use of Sunscreens in Southern Brazil. Clin Dermatol J 2022, 7(4): 000287.

Copyright© Sasso S.

sun, denote a certain carelessness with one's own health, being, therefore, a possible pattern behavioral. This thought shares the same line of reasoning as Moreira, et al. (1995) who, through a population-based study carried out in the city of Porto Alegre (RS), analyzed the variables associated with smoking [36]. Although, like the present study, it also has a cross-sectional design (which does not allow the determination of a causal relationship) - for those authors, the behavioral pattern is the link between smoking and other bad health habits. Data from Vigitel 2020 also show that smokers have characteristics such as male gender and low level of education; these variables in the present study, were independently more associated with the non-use of sunscreens.

Having access to a supplementary health plan proved to be a protective factor for not using sunscreen. With a relative risk reduction of around 16%, those who have this resource are less likely to not use sunscreen. Discussion in the literature about this association is scarce. It is believed that the difference is based on the greater ease of access to health care and, therefore, easier access to information on disease prevention, including dermatological ones, for those who have a supplementary health plan. Regarding the ease of care, it is known that, despite the progress made by public care, outside the supplementary health sector, the routine of care is still marked by queues that start at dawn, not to mention the delay in scheduling appointments. consultations with specialists, in this case, dermatologists. Thus, absence of queues, greater problem-solving capacity, flexible service hours, shorter distances between the patient and the health team, and quick access to specialists, are conditions that promote easy access to important information about health self-care. Supporting this hypothesis, we cite a study carried out with data from 114,615 users linked to 30,523 health teams obtained through the database of the National Program for the Improvement of Access and Quality of Primary Care (PMAQ-AB), where customer satisfaction users was associated with items such as ease of access; proximity, quality and resolution of the services provided; infrastructure quality; and attention to spontaneous demand [34]. If these characteristics were part of the reality of primary health care, theoretically there would be no difference in the prevalence of the outcome studied between the public and private health sectors. However, this research found no association between the outcome and the fact that, for example, the household was registered in a primary health care unit, raising the question of a possible gap between what is proposed and what, in fact, happens to the user of primary care in the SUS.

Another finding of the present study is that respondents who claimed to walk in their free time are 24% less likely to not use sunscreen, in agreement with the findings of Silva (2017) [11]. In those who walk for commuting, and not for leisure, it was not possible to observe this association. Likewise, there was no association between the outcome and the fact of using a bicycle to travel, possibly due to the small number of respondents (5.1%) who have this habit, compromising the statistical analysis. It is worth remembering that walking for leisure (or for health care) is distinguished from walking (or cycling) out of necessity as a means of displacement; leisure and need are different conditions, practiced by individuals with different socioeconomic and cultural characteristics [37]. Thus, it is assumed that those who walk for leisure or for health care have a level of understanding that accompanies a higher level of education, a variable that, as already demonstrated, has an inverse linear association with the outcome.

Contrary to the results of Cardoso (2017) [19], there was no difference when assessing photoprotection between individuals who had already had skin cancer and those who had not. A possible explanation for this is the low number of people with skin cancer in the study population (1.5%), leading to a lack of statistical power to find this association. It is noteworthy that this low number of occurrences is favored both by the underdiagnosis of skin cancer and by its underreporting, which affects the determination of the real prevalence of this disease [37,38]. It is also noteworthy that the variable "history of skin cancer" was self-reported, and these data may be imprecise. It is noteworthy that individuals who have already had skin cancer are at increased risk of recurrence [39] and, for this reason, the importance of photoprotection in individuals whose skin has already been affected by cancer is reinforced here.

Both the prevalence of non-use of photoprotectors presented here and the factors related to it should be interpreted with caution, given the presence of some limitations of this study. The prevalence of non-use of sunscreens may be underestimated, since respondents may, in order to avoid possible embarrassment towards the interviewer, increase the use of sunscreens. The data collection instrument did not allow us to evaluate details of the use of photoprotectors such as the frequency of application, both in number of applications per day and in number of days per week, compromising the characterization of the use, in fact, regular. Variables generated by self-reported information (such as skin cancer history) may have suffered from a loss in their degree of reliability. In addition, the cross-sectional design does not allow the establishment of a causal relationship between the independent variables and the outcome. Despite being a population-based study and, consequently, having a representative sample, any characteristics that are particular to the population studied may limit the extrapolation of the results, since the sample had a predominance of women and the elderly.

As a strength, we highlight the fact that the sampling process of the study was conducted in two stages and had a representative sample of a municipality in the south of Brazil. In addition, important independent variables that are little explored in scientific works on this topic were analyzed.

Conclusion

Sun protection through sunscreen is a simple measure that has a direct impact on reducing the incidence of skin cancer, but not using this resource is a more frequent habit than expected. In Criciúma (SC), the prevalence of non-use of sunscreen is 52.8%, being higher among male individuals, smokers, who do not have a supplementary health plan and who do not walk in their free time. Prevalence increases linearly with age and decreases linearly with increasing education. Encouraging the regular use of sunscreens, especially in the most vulnerable individuals, is a simple measure that aims to reduce not only morbidity and mortality from photomediated diseases, especially skin cancer, but the financial impact on the health system. Studies that support the evidence found here and that clarify other factors associated with not using sunscreens are needed.

References

1. Schalka S, Steiner D, Ravelli FN, Steiner T, Terena AC, et al. (2014) Brazilian Consensus on Photoprotection. An Bras Dermatol 89: 01-76.

2. WHO (1992) IARC Working Group on the Evaluation of Carcinogenic Risks to Humans. Solar and Ultraviolet Radiation. In: IARC Monographs on the Evaluation of Carcinogenic Risks to Humans. Lyon (FRC).

3. WHO (2012) IARC Working Group on the Evaluation of Carcinogenic Risks to Humans. Radiation - A Review of Human Carcinogens. In: IARC Monographs on the Evaluation of Carcinogenic Risks to Humans. Lyon (FRC).

4. Rembielak A, Ajithkumar T (2019) Non-Melanoma Skin Cancer – An Underestimated Global Health Threat? Clin Oncol 31(11): 735-737.

5. National Cancer Institute (2020) Estimate: Cancer Incidence in Brazil. INCA, Rio de Janeiro.

6. National Cancer Institute (2019) Cancer mortality in Brazil, 2019: INCA, Rio de Janeiro.

7. Olsen CM, Wilson LF, Green AC, Bain CJ, Fritschi L, et al. (2015) Cancers in Australia attributable to exposure to solar ultraviolet radiation and prevented by regular sunscreen use. Aust NZJ Public Health. 39(5): 471-476.

8. Olsen CM, Wilson LF, Green AC, Biswas N, Loyalka J, et al. (2018) How many melanomas might be prevented if more people applied sunscreen regularly? Br J Dermatol 178(1): 140–147.

9. Mulliken JS, Russak JE, Rigel DS (2012) The Effect of Sunscreen on Melanoma Risk. Dermatol Clin 30(3): 369-376.

10. Cardoso MG (2007) Transforming the coal capital into a city of ethnicities: the process of transforming the urban identity of Criciúma / SC in its centenary period (1980). Texture 16: 127-141.

11. Silva ES da, Dumith SC (2019) Non-use of sunscreen among adults and the elderly in southern Brazil. An Bras Dermatol 94(5): 567-573.

12. Duquia RP, Baptista Menezes AM, Reichert FF, de Almeida HL (2007) Prevalence and associated factors with sunscreen use in Southern Brazil: A population-based study. J Am Acad Dermatol 57(1): 73–80.

13. Silva ES da, Tavares R, Paulitsch F da S, Zhang L (2018) Use of sunscreen and risk of melanoma and non-melanoma skin cancer: a systematic review and meta-analysis. Eur J Dermatology 28(2): 186-201.

14. Ghiasvand R, Lund E, Edvardsen K, Weiderpass E, Veierød MB (2015) Prevalence and trends of sunscreen use and sunburn among Norwegian women. Br J Dermatol 172(2): 475–483.

15. Holman DM, Ding H, Freeman MB, Shoemaker ML (2019) Association between Sun Protection Behaviors and Sunburn among US Older Adults. Gerontologist 59: S17-27.

16. Williams SN, Dienes KA (2014) Sunscreen sales, socio-economic factors, and Melanoma incidence in Northern Europe: A population-based ecological study. SAGE Open 4(4).

17. Brazilian Institute of Geography and Statistics. Cities and States. IBGE, Rio de Janeiro. 2020.

18. Lomas A, Leonardi-Bee J, Bath-Hextall F (2012) A systematic review of worldwide incidence of nonmelanoma skin cancer. Br J Dermatol 166(5): 1069-1080.

19. Cardoso FA de M e. S, Mesquita GV, Campelo V, Martins M do C de C, Almeida CAPL, et al. (2017) Prevalence of photoprotection and its associated factors in risk group for skin cancer in Teresina, Piauí. An Bras Dermatol 92(2): 206–210.

20. Green AC, Williams GM, Logan V, Strutton GM (2011)

Reduced melanoma after regular sunscreen use: Randomized trial follow-up. J Clin Oncol 29(3): 257-263.

21. Hughes MCB, Williams GM, Baker P, Green AC (2013) Sunscreen and prevention of skin aging: A randomized trial. Ann Intern Med 158(11): 781-790.

22. Young AR, Claveau J, Rossi AB (20117) Ultraviolet radiation and the skin: Photobiology and sunscreen photoprotection. J Am Acad Dermatol 76(3): S100–109.

23. Gavin A, Boyle R, Donnelly D, Donnelly C, Gordon S, et al. (2012) Trends in skin cancer knowledge, sun protection practices and behaviors in the Northern Ireland population. Eur J Public Health 22(3): 408-412.

24. Holman DM, Berkowitz Z, Guy GP, Hawkins NA, Saraiya M, et al. (2015) Patterns of sunscreen use on the face and other exposed skin among US adults. J Am Acad Dermatol 73(1): 83-92.e1.

25. Seité S, del Marmol V, Moyal D, Friedman AJ (2017) Public primary and secondary skin cancer prevention, perceptions and knowledge: an international cross-sectional survey. J Eur Acad Dermatology Venereol 31(5): 815–820.

26. Griffith DM, Gilbert KL, Bruce MA, Jr RJT (2016) Men's Health in Primary Care. Men's Heal Prim Care.

27. McKenzie C, Rademaker AW, Kundu RV (2019) Masculine norms and sunscreen use among adult men in the United States: A cross-sectional study. J Am Acad Dermatol 81(1): 243-244.

28. Alexandre C, Alencar G De, Maia LP, Geral R, Rgp P (2011) Socioeconomic profile of Brazilian fishermen-Socioeconomic profile of the Brazilian fishermen. 44(1100): 12-19.

29. Fernandes ÂCP, Vaz AB (2012) Profile of body mass index of workers from a construction company TT - Profile of body mass index of workers from a construction company. J Heal Sci Inst 30(2): 144-149.

30. Mattei (2010) New portrait of family farming in Santa Catarina. Meeting Econ Catarinense Anais.

31. Luong J, Davis RE, Chandra A, White AE, Harber ID, et al. (2020) A cross-sectional survey of prevalence and correlates of sunscreen use among a rural Tri-State Appalachian population. Arch Dermatol Res 313(4): 295-298.

32. Freedman A, Nicolle J (2020) Social isolation and loneliness: The new geriatric giants Approach for primary care. Can Fam Physician 66(3): 176-182.

33. Menezes RL de, Bachion MM, Souza JT de, Nakatani AYK (2011) Longitudinal study of the multidimensional aspects of the health of institutionalized elderly people. Rev Bras Geriatr and Gerontol 14(3): 485-496.

34. Cantalino JLR, Scherer MD dos A, Soratto J, Schäfer AA, Anjos DSO dos (2021) User satisfaction with primary health care services in Brazil. Rev Saude Publica 55(1): 22.

35. Bocquier A, Fressard L, Legleye S, Verger P, Peretti-Watel P (2016) Social Differentiation of Sun-Protection Behaviors: The Mediating Role of Cognitive Factors. Am J Prev Med 50(3): e81-90.

36. Moreira LB, Fuchs FD, Moraes RS, Bredemeir M, Cardozo S (1995) Prevalence of smoking and associated factors in a metropolitan area of southern Brazil. Rev Saude Publica 29(1): 46-51.

37. Teixeira IP, Nakamura PM, Kokubun E (2014) Walking in leisure and commuting and association with socioeconomic factors and perceived environment in adults. Rev Bras Kinanthropometry and Performance Hum 16(3): 345-358.

38. Rogers HW, Weinstock MA, Feldman SR, Coldiron BM (2015) Incidence estimate of nonmelanoma skin cancer (keratinocyte carcinomas) in the us population, 2012. JAMA Dermatology 151(10): 1081–1086.

39. Fitzpatrick TB (1988) The Validity and Practicality of Sun-Reactive Skin Types I Through VI. Arch Dermatol 124(6): 869-871.

Sasso S. Factors Associated with Non-Regular Use of Sunscreens in Southern Brazil. Clin Dermatol J 2022, 7(4): 000287.

Copyright© Sasso S.