

## **RISK FACTORS AND SKIN CANCER IN ADULTS FROM THE CITY OF MACHALA - ECUADOR**

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**Abstract: Introduction:** Skin cancer in adults is a multifactorial event that increases considerably every year. **Goal:** To relate risk factors with cancer in adults who attend the outpatient service of the IESS Machala General Hospital in Ecuador, from January to December 2019. **Materials and methods:** Descriptive, correlational research, non-experimental prospective and cross-sectional design. Regarding the instrument, a questionnaire of risk factors was applied, which contains 11 questions about skin cancer, whose authorship corresponds to Morales Martha et al. **Results:** Descriptive and inferential statistics (Spss 23) were used. The results obtained were: General Characteristics: Average age 67.61+/- 14.61 years. Predominantly: female sex 54.1%, marital status 31.5% married, level of education 47.2% secondary, site of injury: 15.1% Region: Dorso Nasal, 10.8%, Right Malar, 8, 1%. Risk Factors skin color 50.7% white, normal hair color: 34.2% dark brown, eye color: 50.7%, dark color, skin reddened by the sun: 71.0% said yes, Relatives with cancer 86.3% did not have, Work outdoors 50.7% do it, have lived in areas of intense sun 100% answered yes, practice activities outdoors 58.9% do, consumption of well water for more than 10 years: 65.8% do not consume, 100% have not received radiotherapy for cancer, the most frequent diagnoses by Pathological Anatomy: Solid Basal Cell Carcinoma (CBC) 57.5%, Melanoma 4, 1%, Squamous cell carcinoma 2.7%, T-cell lymphocyte 1.4%. The only risk factor associated with skin cancer was outdoor work ( $p=0.001$ ). There was no relationship between the cancer site and the pathological diagnosis. **Conclusion:** Outdoor work is a risk factor associated with skin cancer in Ecuador.

**Keywords:** Skin cancer, Risk factors, adults.

## INTRODUCTION

Skin cancer encompasses tumors of different cell lines, each with different activity, presentation, treatment and prognosis, among which the following can be mentioned: basal cell carcinoma, squamous cell carcinoma, malignant melanoma, sebaceous gland adenocarcinoma, sarcomas and lymphomas, as well as some rare tumors (Dzwierzynski, 2021).

Basal cell carcinoma in Caucasians accounts for 75 to 80% of skin cancer cases, followed by squamous cell carcinoma (SCC) with 20 to 25% of cases and very small percentages for melanoma and other even rarer neoplasms (Thet et al., 2021). Approximately 90% of basal cell carcinomas are most frequently located in sun-exposed areas, that is, the face, ears, scalp, and arms (Karlsson et al., 2021).

Its presentation in most cases is indolent, progresses slowly and very rarely produces metastasis (Lavanderos F. et al., 2010). The aggressiveness of basal cell carcinoma depends on factors such as: the location in areas of the face, including the edges of the eyelids or nose and a size greater than 2 cm, the morpheaform subtype, infiltrative as well as neural invasion and vascular permeation can aggravate prognosis (Telich Tarriba et al., 2017).

Squamous cell or squamous cell carcinoma also has a predilection for sun-exposed areas such as the face, neck, back, and back of the hand (Álvarez Castillo et al., 2020). This type of carcinoma arises in areas of actinic keratosis, whose risk of progression to squamous cell carcinoma ranges from 0.25 to 20% in a time of evolution ranging from 10 to 25 years, mortality is higher than that of basal cell carcinoma (Sánchez & Nova, 2013).

Regarding the risk factors of basal cell carcinoma, we have that its etiology is still

very unclear, despite its high frequency, there are few data on risk factors (Morales-Sánchez & Peralta-Pedrero, 2013). In a study carried out in the population of Córdoba (Argentina), potential risk factors for basal cell carcinoma were evaluated; This study concluded that significant risk factors are skin phototypes I, II, and III, high recreational sun exposure after 20 years of age, high sun exposure on beach vacations, and the presence of actinic keratoses (Sánchez & Nova, 2013).

Due to the fact that skin cancer has been progressively increasing, and that, in Ecuador, there are few works related to skin cancer studied directly, it was necessary to carry out this investigation in order to be able to look for causes that are possibly affecting this considerable increase in the population, increasingly exposed to risk factors such as sun exposure in work, educational and recreational activities (Barquero Orias et al., 2019).

Is there a relationship between risk factors and skin cancer in adult patients attended the Dermatology consultation at the Machala General Hospital of the Ecuadorian Institute of Social Security in the city of Machala-Ecuador in the period from January to December 2019?

The high incidence of skin cancer ranks first among all types of cancer, added to the severity and the sequelae that they leave, in cases such as melanoma, which, not being diagnosed in early stages, produces rapid metastases and even death (Aceituno-Madera et al., 2011).

The relevance of this research is justified both from a methodological, social and scientific point of view, in the sense that it allowed obtaining first-hand information to contribute to the study and improvement of the health of patients with skin cancer in the equator.

## MATERIALS AND METHODS

The present investigation is quantitative according to its nature insofar as it refers to values or numerical data expressed in interval or ratio scales, which is framed within the positivist paradigm. According to the analysis of the phenomenon and level of depth, it is of a descriptive type due to the description of the characteristics, the types of cancer and the risk factors. It is correlational due to the evaluation that is carried out to determine the degree of relationship between the variables under study.

In a cross-sectional design because the data is collected in a certain period of time and non-experimental because the study variables are not involved.

The population is census type. It was represented by the 73 adults who attended the outpatient clinic of the IESS Machala General Hospital in the city of the same name, from January to December 2019, who met the inclusion and exclusion criteria of the study.

After knowing the total number of the population, in this investigation, the sample was not used because the population was of a census type. why all individuals who meet the inclusion criteria were studied.

They included:

- All adult patients who attend the Dermatology service of the IESS Machala General Hospital.
- That meet the criteria for skin cancer by anatomopathological study.
- Who want to enter the study after due explanation.

They were excluded:

- All cancer patients who do not correspond to the age group.
- Do not meet criteria for skin cancer

A questionnaire was used for risk factors associated with skin cancer without modifications, whose authors are: Martha Alejandra Morales-Sánchez, María Luisa

Peralta-Pedrero and María Antonieta Domínguez-Gómez. This instrument was applied to individuals who met the inclusion criteria (Morales-Sánchez & Peralta-Pedrero, 2013).

It is important to mention that the patients who presented clinical characteristics suggestive of skin cancer underwent a biopsy, which was fixed with 10% formalin and transferred to the laboratory, where a code was assigned and it was processed with the paraffin method. 4  $\mu$ m sections were made and stained with hematoxylin-eosin stain. Then the anatomopathological diagnosis was made, determining with this, the inclusion or not in the study. In addition, the type of cancer was indicated.

The data analysis will be tabulated according to discrete nominal and quantitative qualitative variables and entered into the IBM SPSS Statistics version 23.00 program, identifying qualitative variables that will be expressed as absolute and relative frequencies. The mean was used as a measure of central location, as well as the standard deviation.

Pearson's correlation and likelihood ratio were used to compare variables. The preference of data with cancer in adults and risk factors in terms of morbidity will be expressed in absolute and relative form, both in Tables and will have a statistical significance of  $p < 0.05$ . and a 95% confidence interval.

## RESULTS

**General Characteristics of patients with skin cancer attended by Outpatient Consultation of the IESS Machala Hospital Period January to December 2019.**

Characteristic	Frequency	Percentage
Age (years) M/D	67,61+/-14,61	
Minimum Limit	37	
Maximum Limit	93	
Gender		
Male	33	45,2
Female	40	54,1
Marital status		
Single	7	9,7
Married	23	31,4
Free Union	15	20,6
Divorced	20	27,4
Widower	8	10,9
Degree of instruction		
Primary	26	36,1
Secondary	34	47,2
Superior	12	16,7
<b>TOTAL</b>	<b>73</b>	<b>100%</b>

Values Expressed in Mean. Standard deviation. frequencies and Percentages.

Table 1: The General Characteristics of the patients with Skin Cancer were analyzed, where we observed that the Mean and the Standard Deviation of the Age was 67.61+/- 14.61 years with a Minimum Limit of 37 and the Maximum of 93 years. The predominant sex was female with 54.1% (40) and male 45.2% (33). Regarding marital status, 31.5% (23) married, 27.4% (20) divorced, 20.5% (15) free union, 10.8% (8) Widowed, 9.6% (7) singles. The Level of Instruction 47.2% (34) secondary, 36.1% (27), 16.7% (12) Universities.

**Place of Skin Cancer Lesion in patients seen in Outpatient Consultation. From the IESS Machala Hospital Period 2019.**

Type and Site of Cancer	Frequency	Percentage
Nasal Dorsum	11	15,1
Right Malar Region	8	10,8
Left Malar Region	6	8,1
Right Frontal Region	4	5,5
Left Frontal Region	3	4,1
Right cheek	3	4,1
Left Corner of Left Eye	3	4,1
Back of Left Hand	3	4,1
Right Periauricular Region	3	4,1
Nose tip	2	2,7
Chin Skin	2	2,7
Left Superciliary Arch	2	2,7
Left corner of Right eye	2	2,7
Lower right eyelid	2	2,7
Others	19	26,5
Over one injury	3	3,9
<b>Total</b>	<b>73</b>	<b>100%</b>

Values Expressed in Mean. Standard deviation. frequencies and Percentages

Table 2: The most frequent place or site of the skin cancer lesion: 15.1%(11) in the Dorso-Nasal Region, 10.8%(8) Right Malar Region, 8.1%(6) Left Malar Region, 5.5%(4) Right frontal region, 4.1%(3) Left frontal region, (4.1%) Right cheek, 4.1%(3) Left corner of Left eye, 4.1%(3) Left Hand Dorsum, 4.1%(3) Right Periauricular Region, 2.7%(2) Nasal Tip, 2.7%(2) Chin Skin, 2.7%(2) Left Superciliary Arch, 2.7 % (2) Left corner of Right eye, 2.7%(2) Lower Right eyelid. 26.5%(19) were grouped as others because the location was 1.4%(1) in other parts of the body: Dorsal Region, Scalp Left Foot Plant, left elbow, right forearm, right shoulder, cheek left, right eyebrow tail, Vermilion skin, right nasal ala, right auricle, pectoral region, right lower eyelid, left lower eyelid, right arm, right back, left chest anterior region. It was evaluated if there was more than one lesion and we observed that 3.9% of the patients presented more than one lesion (vermillion skin and left corner of the lips, right back and left back, and chin skin with nasal back).

**Risk Factors: Skin color. Natural hair. Color of Eyes and Skin Reddened by the sun in Patients with skin cancer. January/ December 2019**

Risk factors	Frequency	Percentage
Skin color		
White	37	50,7
Clear Brown	19	26,0
Dark Brown	11	14,9
Black	33	45,2
Natural Hair Color		
Dark coffee color	25	34,2
Clear coffee color	24	32,9
Red	4	5,5
Black	20	27,4
Eyes color		
Dark color	37	50,7
Clear coffee color	25	34,3
Green	6	8,2
Black	5	6,8
<b>Sun Reddened Skin</b>		
YES	52	71,2
NO	21	28,1
<b>TOTAL</b>	<b>73</b>	<b>100</b>

Values Expressed in Frequencys and Percentages

Table 3: We evaluated the risk factors presented by patients with skin cancer, where it was observed that skin color of 50.7% (37) was white skin, while 26.0% (19) had brown skin light and 14.9(11), dark brown and 8.2%(6) black skin. Natural Hair Color: 34.2%(25) Dark Brown, 32.9%(24) Light Brown, 27.4%(20) Black and 5.5%(4) Blonde. Regarding the color of the eyes, 50.7% (37) were dark; 34.3%(25) light brown, 8.2%(6) Green and 6.8%(5) Black. Reddening of the skin with the sun: 71.2% (52) answered Yes and 28.8% (21) stated that their skin did not redden.

**Risk Factors: Family with Cancer. Outdoor Work. Has Lived in Intense Sun Zone. in patients with skin cancer. Period January / December 2019**

Risk factors	Frequency	Percentage
<b>Family with Cancer</b>		
YES	10	13,7
NO	63	86,3
<b>Outdoor Work</b>		
YES	37	50,7
NO	36	49,3
<b>The person Has Lived in Hot Sun Zone</b>		
YES	73	100,0
NO	0	0
<b>Practice Outdoor Activity</b>		
YES	43	58,9
NO	30	41,1
<b>The person has consumed Well Water:10 years</b>		
YES	48	65,8
NO	25	34,2
<b>Have you had chemotherapy</b>		
YES	0	0
NO	73	100,0
<b>TOTAL</b>	<b>73</b>	<b>100%</b>

Values expressed in Frequencies y Percentages

Table 3: We continued with the Risk Factors associated with skin cancer, where 86.3% (63) had no family history of skin cancer; 13.7% (10) if they had relatives with a history of skin cancer. 100% (73) reported having lived in an area of intense sun; 58.9% (43) practice outdoor activity; 41.1% (30) do not practice it outdoors. Regarding the consumption of Well Water for more than 10 years, 65.8% (48) refer to consuming it while 34.2% (25) do not consume it. When asked if they had received radiotherapy, 100% (73) stated that they had not received it.

**Anatomical Pathological Diagnoses of patients with skin cancer attended by the Outpatient Consultation of the IESS Machala Hospital Period 2019**

Anatomic Pathology Diagram	Frequency	Percentage
Basal cell carcinoma	57	78
Squamous cell carcinoma	11	15.1
Melanoma	3	4,1
Others	2	2,8
<b>TOTAL</b>	<b>73</b>	<b>100%</b>

Table 4. The Anatomical Pathological Diagnoses of skin cancer are reported in (Table 4), where we were able to observe them. Basal cell carcinomas (BCC), 78% (42); Squamous cell BCC, 15.1%(6); Melanoma, 4.1%(1); OTHER T-Cell Lymphoma with 1.4%(1), Malignant Eccrine Spiroadenoma 1.4%.

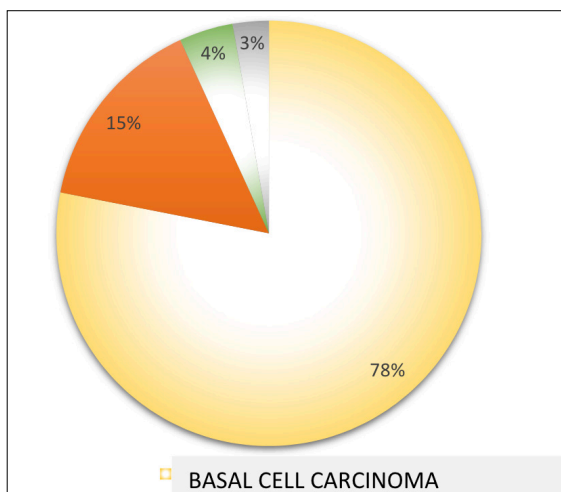


Figure 1. Pathological diagnosis.

Pathology Diagram of Basal Cell Carcinoma	Frequency	Percentage
Basal cell solid carcinoma	33	58
CBC with adenoid pattern	8	14
Ulcerated solid BCC	7	12
Pigmented solid CBC	6	11
Superficial spreading CBC	2	3
Solid Cystic BCC	1	2
<b>TOTAL</b>	<b>57</b>	<b>100%</b>

Values expressed in frequencies and percentages Table 4a. Anatomopathological diagnoses of patients with skin cancer treated by outpatient consultation of the IESS Machala Hospital Period 2019.

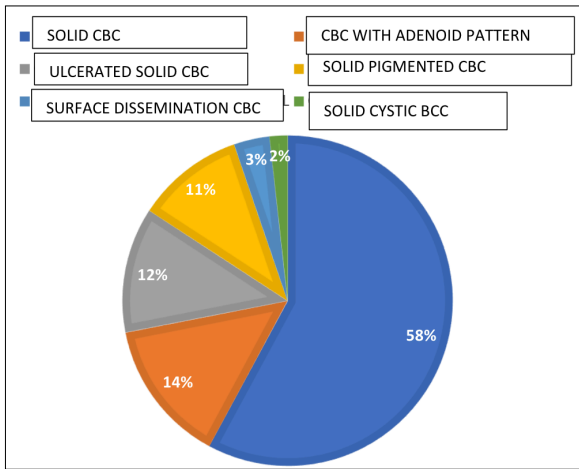


Figure 2. Pathological Diagnosis of Basal Cell Carcinoma.

### Correlation between Skin Cancer and Risk Factors Attended by External Consultation of the IESS Machala Hospital Period 2019

Skin cancer	Outdoor work	Foot color	Reddened skin	Family with Cancer
Correlation	397**	395**	394**	254**
Sig	0,01	0,01	0,01	0,03
N	73	73	73	73

Correlation was positive at 0,01

Table 5. When performing the Pearson correlation between the Risk Factors and skin cancer by pathological diagnosis, it was possible to observe the Risk Factors that had a strong and positive relationship were outdoor work with a value of ( $p = 0.001$ ), skin color ( $p=0.00$ ), flushed skin, ( $p 0.00$ ), family with cancer. ( $p=0.03$ ).

## DISCUSSION

Skin cancer is one of the most common neoplasms, ranking first in some countries (Barquero Orias et al., 2019; Miolo et al., 2019; Sinikumpu et al., 2022). The risk that a person has of developing skin cancer depends on several risk factors, among which constitutional and environmental ones can be mentioned (Fernández et al., 2016; Vila Blanco & Nabhan, 2016; Waldman & Schmults, 2019). Constitutional factors include personal or family history, light or red hair, sensitivity to sun exposure, multiple melanocytic nevi, among others (Alonso & Salerni, 2016; Caparrotti et al., 2020; Maubec, 2020). The best established and most important risk factor is ultraviolet (UV) radiation (Cristy & Garrido Jessica, 2018; Llombart et al., 2017; Zavattaro et al., 2019).

Considering that the increase in this pathology represents a serious health problem for Ecuador, given the circumstances observed in dermatological consultations, and in an attempt to identify the factors that could be causing skin cancer, we focus the objective of this investigation on to relate risk

Pathology Diagram of Squamous Cell Carcinoma	Frequency	Percentage
Well-differentiated squamous cell carcinoma	9	81,82
Moderately differentiated squamous cell carcinoma	1	9,09
Poorly differentiated squamous cell carcinoma	1	9,09
<b>TOTAL</b>	<b>11</b>	<b>100%</b>

Values expressed in frequencies and percentages

Table 4b. Pathological Diagnosis of Squamous Cell Carcinoma.

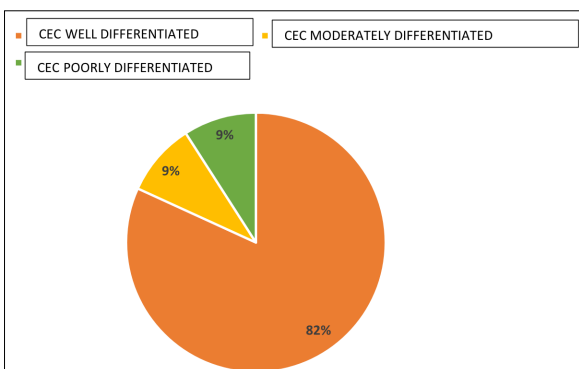


Figure 3. Pathological Diagnosis of Squamous Cell Carcinoma.

factors with skin cancer in adults who attend the Dermatology outpatient service of the Machala General Hospital of the IESS in the city of Machala, Ecuador.

The results provided by the research in relation to the general characteristics, the average age was 67.61 +/- 14.61 years, the most frequent type of cancer was basal cell, results that coincide with those reported by Telich et al, in his study called "Diagnosis and treatment of malignant skin tumors", where it is shown that basal cell carcinoma is the most common skin cancer.

The average age between 40 and 70 years, also coincide with said author regarding the location. There is involvement mainly of the head and neck region, approximately, in 70% of cases; of them, 26% are located in the nose. It is also present in the trunk region by 15%, in this investigation 15.1% in the Dorso Nasal region, 18.9% in the right and left Malar region, the results differ from the aforementioned author, who reports that the male sex is the most affected.

In this investigation, it was found that the predominant sex was female with 31.5%. The results also agree with those of Sánchez et al. In his study "Skin cancer. Epidemiology and histological varieties carried out in patients with biopsy of malignant skin neoplasia. Information was collected through pathology reports, where it was found that 71% were basal cell carcinoma, 41 (15%) squamous cell carcinoma, 14 (5%) melanoma and 23 cases (9 %), other neoplasms. The incidence and histological variety present in this study are similar to those of the rest of the country and to those published worldwide (Vila Blanco & Nabhan, 2016).

Sánchez and Nova in the study "Risk factors for squamous cell carcinoma, proposed to establish the risk factors for squamous cell carcinoma (Sánchez & Nova, 2013). They identified risk factors such as a family history

of skin cancer, living in a rural area after the age of 30, working outdoors for long periods of life, smoking more than 10 cigarettes a day, actinic conjunctivitis, multiple actinic keratoses on the face and multiple freckles. They concluded that the risk factors associated with personal history and clinical characteristics must guide the doctor in taking preventive and follow-up measures, depending on the case (Sánchez & Nova, 2013).

Regarding the associated risk factors, Sánchez and Nova use risk factors in their study, most of which are different from the one used in the proposed study, where it was possible to demonstrate that outdoor work is directly related to breast cancer. skin, the most frequent factors, white skin, dark brown the natural color of the hair, dark color of the eyes, skin reddened by the sun, relatives with cancer, living in areas of intense sun, outdoor activities, drinking water well, if they have received radiotherapy they were present in the patients, but they were not statistically associated ( $p > 0.05$  Pearson correlation) with skin cancer (Sánchez & Nova, 2013).

Ecuador presents skin cancer more frequently in men (Cristy & Garrido Jessica, 2018; Diering et al., 2018; LA et al., 2017; Sung et al., 2021).

The limitations of the research were the difficulty in collecting the sample due to the covid-19 pandemic, therefore, Ecuador was not indifferent to this situation.

## CONCLUSION

Once the investigation has been completed and the objectives set have been achieved, it is concluded that:

General Characteristics: Average age was 67.61 +/- 14.61 years with a minimum limit of 37 and a maximum of 93 years. The predominant sex was female. Marital status, the majority were married and the level of secondary education.



The most frequent cancer location site: Nasal Dorsum, Right Malar Region, Left Malar Region and Right Frontal Region.

Risk Factors: most skin color: they were white people, with dark brown hair color, dark eye color, their skin turns red in the sun, they did not have a family history of cancer, they worked outdoors free, live in an area with intense sun, practice outdoor activity, have consumed well water in the last 10 years and have not received radiotherapy for cancer.

The Pathological Results, it was observed that the most frequent was Solid Basal Cell Carcinoma. Followed by well-differentiated squamous, adenoid basal cell carcinoma, and ulcerated basal cell carcinoma. Other Reported Cancers: Melanomas, Squamous Cell and T-Cell Lymphocyte and Hawthorn Malignant Eccrine Adenoma.

The Risk Factors that were related to skin cancer were outdoor work, skin color, reddened skin and family with cancer.

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