

# Assessment of Quality of Life Following Diagnosis in Patients with Cervicofacial Non-melanoma Skin Cancer

**Pablo García-Montero<sup>1,2</sup>, María Victoria de Gálvez-Aranda<sup>2</sup>, Nuria Blázquez-Sánchez<sup>1</sup>, Francisco Rivas-Ruiz<sup>3,4</sup>, José Francisco Millán-Cayetano<sup>1</sup>, Cristina García Harana<sup>1,2</sup>, Magdalena de Troya Martín<sup>1</sup>**

<sup>1</sup>Department of Dermatology, Hospital Costa del Sol, Marbella, Spain; <sup>2</sup>Universidad de Málaga, Málaga, Spain; <sup>3</sup>Research Unit, Hospital Costa del Sol, Marbella, Spain; <sup>4</sup>Health Services Research Network for Chronic Diseases (REDISSEC), Madrid, Spain

## Corresponding author:

Pablo García-Montero, MD  
Hospital Costa del Sol. Autovía A7 - Km 187  
29600 Marbella  
Spain  
[garciamonteropablo@gmail.com](mailto:garciamonteropablo@gmail.com)

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**ABSTRACT** Non-melanoma skin cancer (NMSC) is the most common neoplasm. The characteristics of this disease (location in aesthetically sensitive areas, the appearance of successive tumors during follow-up, and high rates of survival) are such that the concept of health-related quality of life (HRQoL) is of particular importance. The aim of the present study was to describe and analyse patient quality of life following diagnosis with cervicofacial NMSC. A descriptive cross-sectional study was conducted on patients with cervicofacial NMSC, confirmed by skin biopsy. In each case, when the definitive diagnosis of NMSC was established, the patient completed the Skin Cancer Index questionnaire and demographic data, health status, and sun exposure habits were recorded. The study population was composed of 220 patients with histologically confirmed cervicofacial NMSC. The mean score obtained for the Skin Cancer Index questionnaire was 54.1 (SD 21.9), in which the social-aesthetic component had a mean score of 76.7 (SD 26.2), while the emotional component had a mean score of 23 (SD 25.1). Male patients, those with secondary or higher education, and those who had no history of anxiety or depression had significantly higher mean scores for HRQoL. This study demonstrated that the diagnosis of cervicofacial NMSC significantly impacts HRQoL and that certain population groups (women, persons with only primary or no education qualifications, and those a history of anxiety or depression) are more susceptible. The questionnaire scores obtained were lower than those reported in previous studies on this topic and reflect a particularly strong impact on emotional aspects of patient quality of life.

**KEY WORDS:** skin cancer, basal cell carcinoma, squamous cell carcinoma, quality of life

## INTRODUCTION

Basal cell carcinoma (BCC) and squamous cell carcinoma (SCC) are the two most common types of skin cancer. Both are included in the term non-melanoma

skin cancer (NMSC) and comprise 99% of this variant of skin tumors (1,2). Together, they account for a third of all cancers diagnosed worldwide (3). Although

there are no exact figures on global incidence, the annual incidence of BCC in the USA has increased from 3% to 10% in the last 30 years, while the worldwide incidence of SCC has increased from 2% to 4% (3-5). The incidence of NMSC is expected to rise progressively until 2040 throughout the world (3).

The development of NMSC is closely related to sun exposure, which is why it is especially prevalent in photoexposed areas of the body, in patients with pale skin, and in geographic locations close to the equator (6). NMSC tumors present little risk of metastasis (0.0028-0.55% for BCC and up to 4% for SCC) and correspondingly low mortality rates (7,8). In contrast, up to 40% of patients experience at least one further NMSC in the three years following the diagnosis of the first (9)<sup>9</sup>.

The high incidence of NMSC provokes significant healthcare costs, and due to its location (60-70% of cases affect the facial and cervical regions) a negative aesthetic and functional impact is also often present (10,11). Moreover, due to the local aggressiveness of these tumors together with treatment sequelae and the high risk of developing successive skin neoplasms, many patients are subject to great uncertainty and concern (12). For these reasons, we believe it essential to consider the health-related quality of life (HRQoL) of patients with NMSC, since this chronic disease, although it does not greatly affect survival rates, has a strong psychosocial impact (13).

Our study aim, therefore, was to determine the impact made by a diagnosis of cervicofacial NMSC on the patient's HRQoL and to identify related factors.

## PATIENTS AND METHODS

### Study design

Descriptive extended cross-sectional study.

### Scope and population

The study was conducted from November 2015 to September 2017 at the Dermatology Department of the Costa del Sol University Hospital (Marbella, Spain). Study participants were selected consecutively from a population of patients with cervicofacial NMSC confirmed by skin biopsy, who had been referred by their primary care physician or were being followed up at the above Dermatology Department after a prior occurrence of NMSC. All participants were voluntary, aged over 18 years, had a sufficient level of written and spoken Spanish, and provided signed informed consent. They were also physically and intellectually capable of completing the study questionnaires and were resident in the hospital's catchment area.

### Intervention

When the physician reported the biopsy result, providing a definitive diagnosis of cervicofacial NMSC, the patient was asked to complete the quality of life questionnaire and relevant demographic variables were recorded (concerning health status and sun exposure habits).

### Measurement instruments

HRQoL was determined according to the Spanish version of the Skin Cancer Index (13), which is a specific questionnaire for patients with cervicofacial NMSC that was adapted to Spanish and validated by de Troya *et al.* from the original version by Rhee *et al.* (14). The questionnaire, designed to be self-administered, consists of 12 items, and the answers are given on a 5-point Likert scale. It is subdivided into two subscales: the social-aesthetic dimension (7 items) and the emotional dimension (5 items). An overall score can be obtained once the questionnaire is completed, and the scores for each of the subscales can also be determined. The possible scores range from 0 (maximum HRQoL deterioration) to 100 (no impact).

The remaining study variables (demographic, comorbidities, and sun exposure habits) were recorded during a clinical interview, together with the clinical and histological characteristics of the tumor. When a patient presented more than one NMSC at the time of diagnosis, the tumor that was first diagnosed in the clinical and dermoscopic examination was considered to be the main tumor.

### Statistical analysis

A descriptive analysis was conducted using measures of central tendency and dispersion for the quantitative variables and of frequency distribution for the qualitative ones. Taking the HRQoL questionnaire scores as the outcome variables, Student's *t* test was used to compare dichotomous qualitative variables (the Anova test was applied when three or more categories were considered), and the Pearson correlation coefficient was determined for the quantitative independent variables. The level of statistical significance was  $P < 0.05$ . All statistical analyses were performed using the SPSS v.15 package.

### Ethical considerations

The study was approved by the Costa del Sol Hospital Research Ethics Committee in September 2015 (IRB 011\_Sep\_PI\_CANCER CUTANEO NO MELANOMA CALIDAD DE VIDA). All the completed questionnaire data were recorded anonymously, in strict accordance with the data protection legislation in force at the time of the study.



## RESULTS

The study population comprised 220 patients with cervicofacial NMSC, confirmed by biopsy, who agreed to participate and completed the HRQoL questionnaire (Table 1). In 96.8% of the patients, the tumor diagnosed was a primary tumor, while in 3.2% it was the recurrence of a previously-treated NMSC. 81.4% of the tumors diagnosed were BCC, of which 73.2% were infiltrative, 11.2% nodular, and 11.7% superficial. The remaining 18.6% corresponded to SCC, of which 70% were *in situ* and 30% were infiltrative. The mean tumor diameter was 9.3 mm (SD 4.6). In 88.6% of cases, the tumor was located on the face, and in 11.4% cases it affected the scalp and/or cervical regions. Synchronous NMSC with one to three new tumors was diagnosed in 18.6% of the patients.

The total mean score obtained for the Skin Cancer Index questionnaire was 54.1 (SD 21.9), with the social-aesthetic component having a mean score of 76.7 (SD 26.2) and the emotional component a mean score of 23.0 (SD 25.1).

Bivariate analysis (Table 2) showed mean questionnaire scores of 57.1 (SD 28.1) for the male patients and 50.9 (SD 21.7) for women. The difference was statistically significant ( $P=0.04$ ). A similar difference was observed for the social-aesthetic component (80.7 (SD 25.6) vs 72.3 (SD 26.2);  $P=0.017$ ). By nationality, the mean score for the emotional component was 21.2 (SD 24.1) among Spanish patients and 39.3 (SD 29.2) among those of foreign origin. The difference was statistically significant ( $P=0.002$ ) in this case as well. The patients with little or no formal education

**Table 1.** Demographic and NMSC-related data

		n	%
Patients (n)		220	100
Sex			
	Male	115	52.3
	Female	105	47.7
Age (years)			
	Mean SD	63.6	11.8
Country of birth			
	Spain	199	86.9
	Other	21	13.1
Education background			
	Primary education or less	123	55.9
	Secondary or higher education	97	44.1
Background of anxiety or depression			
	Yes	75	34.1
	No	145	65.9
Type of tumour			
	Primary	213	96.8
	Recurrent	7	3.2
Tumour lineage			
	BCC	179	81.4
	SCC	41	18.6
BCC subtype			
	Superficial	21	11.7
	Nodular	20	11.2
	Infiltrating	131	73.2
	Not recorded	7	3.9
SCC subtype			
	Superficial	28	70
	Infiltrating	12	30
Maximum tumour diameter (mm)			
	Mean SD	9.3	4.6
Location			
	Face	195	88.6
	Scalp	15	6.8
	Cervical region	10	4.5
Synchronous NMSC			
	Yes	41	18.6
	No	179	81.4
Number of synchronous NMSC tumours			
	1	30	73.2
	2	10	24.4
	3	1	2.4

**Table 2.** -Bivariate analysis

Variable	Overall mean value (SD)	Overall "p"	Mean value for social-aesthetic impact (SD)	Social-aesthetic "p"	Mean value for emotional impact (SD)	Emotional "p"
Sex						
Male	57 (21.8)	0.040	80.7 (25.6)	0.017	24.2 (25.3)	0.469
Female	50.9 (21.7)		72.3 (26.2)		21.7 (24.9)	
Nationality						
Spanish	53.2 (21.5)	0.053	76.3 (26.4)	0.568	21.3 (24.1)	0.002
Foreign	62.9 (24)		79.8 (24.5)		39.3 (29.2)	
Education background						
Primary education or less	51 (20.5)	0.016	75 (25.9)	0.283	17.4 (21.4)	<0.001
Secondary or higher education	58.1 (23)		78.8 (26.4)		30.2 (27.6)	
Background of anxiety or depression						
No	56.7 (22)	0.013	80.5 (25.8)	0.002	23.7 (25.8)	0.591
Yes	49 (20)		69.1 (25.3)		21.7 (23.8)	

had an overall questionnaire score of 51 (SD 20.5), while those with secondary or higher education had a score of 58.1 (SD 23). The difference was statistically significant ( $P=0.016$ ), as was the difference in the emotional component of the questionnaire (17.4 (SD 21.4) vs 30.2 (SD 27.6);  $P<0.001$ ). Finally, the patients with a history of anxiety or depression recorded an overall mean score of 49 (SD 20) and 69.1 (SD 25.3), respectively, for the social-aesthetic component. The corresponding scores were 56.7 (SD 22) and 80.5 (SD 25.8), respectively, for the patients with no such history. The differences were statistically significant ( $P=0.013$  and  $P=0.002$ , respectively).

## DISCUSSION

The question of HRQoL in patients with NMSC has not been studied exhaustively, but has attracted growing attention in recent years (15). Initially, this parameter was studied using generic tools derived from other areas of dermatology, but these suffered from low sensitivity and specificity, and did not properly reflect changes provoked by the diagnosis or subsequent treatment (5-16).

Several previous studies in this field have used the Dermatology Life Quality Index, recording little impact of NMSC on HRQoL (17). Similarly, little impact has been recorded by studies based on generic

QoL questionnaires such as the Short Form 36-Item Health Survey (SF-36) and even by one specific to dermatology, Skindex-16 (18,19). Due to the great heterogeneity of the QoL measurement instruments used in these studies, together with their low sensitivity, it is difficult to compare the results reported and draw solid conclusions from these findings. This problem was overcome in 2005 with the creation of the Skin Cancer Index by Rhee *et al.* (14), which finally made it possible to detect significant changes in the HRQoL of patients with NMSC throughout the healthcare process, and enabled different studies to produce comparable results (20).

The maximum score for each of the SCI sections (overall, social-aesthetic, and emotional) is 100 points. In our study population, the mean scores obtained at the time of NMSC diagnosis were considerably below this figure, especially in the emotional section. Moreover, in comparison with previous studies in which the same questionnaire has been used (Table 3), our population presented the lowest scores recorded to date in both the overall and the emotional sections (21-25). The next lowest were obtained in 2016 by de Troya *et al.* (24), whose study was conducted in the same hospital setting, which highlights the particular susceptibility of the population in this geographic area and the importance of providing supportive therapies for these patients (24).



**Table 3.** Studies that have used the SCI to analyse the patient's quality of life at the time of diagnosis. Mean scores.

Study	n	Overall	Aesthetic	Social	Emotional
Rhee <i>et al.</i> 2007	183	68.3	63.2	81.7	60.1
Caddick <i>et al.</i> 2013	53	70	68.7	75.5	66.6
Sobanko <i>et al.</i> 2016	136	69.8	70.5	79.8	59.2
de Troya <i>et al.</i> 2016*	88	59.2	79.4		31
Okhovat <i>et al.</i> 2019	389	81.9	83.3	95.5	71.4
García-Montero <i>et al.</i> 2019*	229	54.1	76.7		23

\* The Índice de Cáncer Cutáneo, the cross-cultural adaptation of the SCI into Spanish, was used.

The validated Spanish version of the SCI groups the social and aesthetic elements of the questionnaire into a single section, in contrast to the two independent values obtained by studies that use the original English-language questionnaire. Although this makes it difficult to compare our results with previous research findings in this respect, they seem to be in the same line as in our study.

According to our bivariate analysis, male participants, those with secondary or higher education, and those with no history of anxiety or depression scored more highly overall on the questionnaire. By sex, our results corroborate previous reports according to which female sex is the variable most often associated with a poorer overall HRQoL at the time of diagnosis of cervicofacial NMSC (21,22,24,25). With regard to education background, our results are in contrast to those of Caddick *et al.*, who recorded higher overall scores for patients who had left school at age 16 years (22). Other studies, however, reported no significant differences regarding patient education levels. On the other hand, differences have been reported regarding the association between HRQoL scores and patient income and employment circumstances, although these results have little homogeneity except regarding retired/pensioner status, which does seem to be related to better overall scores (23,25). Similarly, patients aged over 50–60 years have been reported to achieve better overall scores, but in our own analysis this variable was not statistically significant (21,23–25).

In the emotional section of the questionnaire, foreign patients and those with higher education scored more highly than Spanish patients and those with fewer qualifications. With regard to education, these results are again in contrast to those reported by Caddick *et al.* (22). However, we consider it reasonable to assume that the higher a patient's academic capabilities, the greater their ability to understand the disease and its prognosis. It should be noted that the foreign population in our study was composed of

patients from central and northern Europe, where the incidence of NMSC is high (26), a factor which might be conducive to a greater degree of acceptance when this disease is diagnosed. Previous studies report varying results in this respect, although there is some consensus that male sex and age greater than 50 years are related to better scores in the emotional section (21,22,25).

In the social-aesthetic section, male patient questionnaire scores were higher than those of the women. Similarly, patients with no history of anxiety or depression scored more highly than those who did have such a history. In prior research focusing on social parameters, the only consensus that was obtained was for age, with patients aged over 50–60 years scoring most highly in this regard (21,23). With regard to questionnaire scores on aesthetic considerations, previous studies concur that men score more highly than women (21–23,25). Similarly, most studies report that older patients score more highly than younger ones (21,23,25), probably because they assign greater importance to survival than to aesthetics and because their already irregular skin texture makes scarring less visible.

Both our study results and those reported previously show that the diagnosis of cervicofacial NMSC produces a severe psychological impact on the patient and that certain groups are especially vulnerable in this respect. Therefore, interventions should be developed to provide psychosocial support for patients when they receive a definitive diagnosis of this disease. The medical specialists who communicate this information should be aware of the emotional significance it has for the patient and possess the dialogue skills and empathy needed to minimize distress. Moreover, as in the case of other dermatological pathologies such as psoriasis or atopic dermatitis (27,28), it would be useful to create specific psychosocial support units with qualified personnel to develop techniques to alleviate the impact on patients HRQoL.



### Limitations

The study only included patients with cervicofacial NMSC. This location is the one most commonly affected and is where treatment and sequelae produce the greatest impact on HRQoL. However, the disease may present in other areas where severe distress may be caused due to the size, difficulty of treatment, or complications of the tumor. Another possible limitation of our study is that although the team of dermatologists whose patients were included in this study followed common guidelines when communicating their diagnosis, individual variations might have occurred in offering this information, and these could have affected the patients' responses to the questionnaire. In addition, questionnaires based on Likert scales sometimes generate a significant ceiling and floor effect in the final scores. Lastly, the fact that the Skin Cancer Index questionnaire has a common section for social and aesthetic issues makes it impossible to precisely compare our results with those obtained using the English-language version of the SCI.

### CONCLUSIONS

The diagnosis of cervicofacial NMSC produces a significant psychosocial impact on the patient. The quality-of-life questionnaire scores obtained in our study are lower than those reported in previous research in this field, particularly for certain population groups that we identify as being especially vulnerable. These findings highlight the need for further consideration of this aspect of the disease, seeking to determine the best means of treating not only the tumor, but also the psychological sequelae suffered by these patients, thus shaping a comprehensive approach to this disease.

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