



# ACTAS Derma-Sifiliográficas

Full English text available at  
[www.actasdermo.org](http://www.actasdermo.org)



## ORIGINAL ARTICLE

### The impact of skin diseases on quality of life: A multicenter study



G. Sanclemente<sup>a,b,\*</sup>, C. Burgos<sup>c</sup>, J. Nova<sup>d</sup>, F. Hernández<sup>e</sup>, C. González<sup>f</sup>, M.I. Reyes<sup>g</sup>,  
N. Córdoba<sup>h</sup>, Á. Arévalo<sup>i</sup>, E. Meléndez<sup>j</sup>, J. Colmenares<sup>k</sup>, S. Ariza<sup>l</sup>, G. Hernández<sup>a</sup>,  
Asociación Colombiana de Dermatología y Cirugía Dermatológica (Asocolderma)

<sup>a</sup> Grupo de Investigación Dermatológica (GRID), Universidad de Antioquia, Medellín, Colombia

<sup>b</sup> IPS Universitaria, Universidad de Antioquia, Medellín, Colombia

<sup>c</sup> Centro de Especialistas del Sur, Bogotá, Colombia

<sup>d</sup> Centro Dermatológico Federico Lleras Acosta, Bogotá, Colombia

<sup>e</sup> Liga contra el Cáncer de Risaralda, Pereira, Colombia

<sup>f</sup> Grupo Colombiano de Psoriasis CoLPsor, Colombia

<sup>g</sup> Universidad Libre de Colombia, Seccional Atlántico, Colombia

<sup>h</sup> Universidad Tecnológica de Pereira, Colombia

<sup>i</sup> Hospital Erasmo Meoz de Cúcuta, Colombia y Hospital Emiro Quintero Cañizares de Ocaña, Colombia

<sup>j</sup> Liga de lucha contra el cáncer, Barranquilla, Colombia

<sup>k</sup> Clínica de especialistas – Sogamoso, Boyacá, Colombia

<sup>l</sup> Fundación Universitaria de Ciencias de la Salud, Bogotá, Colombia

Received 14 June 2016; accepted 6 November 2016

Available online 4 January 2017

#### KEYWORDS

Quality of Life;  
Colombia;  
Skindex-29

#### Abstract

**Introduction:** To date, no formal study has been published regarding how Colombian patients with skin disorders could be affected according to their perception of disease.

**Objective:** To determine the impact in quality of life of skin diseases in a Colombian population.

**Methods:** This multicenter study included patients with skin disease from almost the whole country. Individuals >18 years old; of any gender; with any skin disease and who signed informed consent, were included. We applied the Colombian validated version of the Skindex-29 instrument.

**Results:** A total of 1896 questionnaires had sufficient information for the analyses. No significant differences in sociodemographic characteristics of patients who returned the questionnaire incomplete vs. complete, were found. Participants mean age was 41.5 years. There were no statistical differences in men vs. women regarding the global ( $p = 0.37$ ), symptoms ( $p = 0.71$ ) and emotions ( $p = 0.32$ ) domains, whereas statistical differences were found in the function domain ( $p = 0.04$ ; Mann–Whitney  $U$  test). Psoriasis, contact dermatitis, atopic dermatitis, urticaria,

\* Corresponding author.

E-mail addresses: [sanclementegloria@gmail.com](mailto:sanclementegloria@gmail.com), [gsanclementem@gmail.com](mailto:gsanclementem@gmail.com) (G. Sanclemente).

**PALABRAS CLAVE**

Calidad de vida;  
Colombia;  
Skindex-29

hair disorders, Hansen's disease, scars, hyperhidrosis and genital human papillomavirus disease scored the highest.

*Limitations:* Skindex-29 score variability as a result of differences in the location of the skin lesions, their inflammatory or non-inflammatory nature, and the start of therapy.

*Conclusions:* Even the most localized or asymptomatic skin lesion in our population leads to a disruption at some level of patient's wellness. This study adds well supported scientific data of the burden of skin diseases worldwide.

© 2016 AEDV. Published by Elsevier España, S.L.U. All rights reserved.

## El impacto de las enfermedades cutáneas en la calidad de vida: Un estudio multicéntrico

### Resumen

*Introducción:* En Colombia se carece de estudios que hayan evaluado formalmente el impacto de las enfermedades dermatológicas en la calidad de vida de los pacientes que las padecen.

*Objetivo:* Determinar el impacto en la calidad de vida de las enfermedades cutáneas en una población colombiana.

*Métodos:* Estudio multicéntrico que incluyó a individuos > 18 años de edad; de cualquier sexo, con cualquier trastorno cutáneo y que firmaron el consentimiento informado. Se aplicó la versión validada en Colombia del instrumento Skindex-29.

*Resultados:* Un total de 1.896 cuestionarios se incluyeron en el análisis. No se observaron diferencias significativas en las características sociodemográficas entre los que devolvieron el cuestionario incompleto vs. completo. La edad promedio fue de 41,5 años. No hubo diferencias significativas entre hombres y mujeres con respecto al puntaje global del instrumento, ni de los dominios sintomático o emocional, mientras que sí las hubo en el dominio funcional. Entre las enfermedades que más afectaron la calidad de vida se incluyen: psoriasis, dermatitis de contacto, dermatitis atópica, urticaria, trastornos capilares, lepra, cicatrices, hiperhidrosis y las verrugas genitales.

*Limitaciones:* Las puntuaciones del Skindex-29 mostraron una gran variabilidad explicable por diferencias en la localización de las lesiones de la piel, su naturaleza inflamatoria/no inflamatoria, y la iniciación o no del tratamiento.

*Conclusiones:* Cualquier lesión dermatológica por más localizada o asintomática que sea, condujo a una alteración en algún grado de la calidad de vida dermatológica. Este estudio añade soporte científico a la carga de enfermedad que generan los trastornos cutáneos en el mundo.

© 2016 AEDV. Publicado por Elsevier España, S.L.U. Todos los derechos reservados.

## Introduction

The importance of skin disease is often underestimated by its chronic nature and low mortality, but its frequency is so high that it has been determined that between 21% and 87% of the population may suffer from some type of skin disorder.<sup>1</sup> Indeed, they constitute a quarter of consultations in primary health care due to its related significant physical and psychological impairment,<sup>1,2</sup> as self-image is an essential element in the personality structure which not only affects mental health, but also the attitude toward the environment.<sup>3,4</sup> In addition, it has been described that self-image is predictive of overall satisfaction and, therefore, has a major effect on human's quality of life (QOL)<sup>5</sup> to a level in which a favorable self-image leads to positive emotions, while a unfavorable self-image leads to anxiety, fear, anger, depression and social maladjustment.<sup>6</sup> Moreover, skin appearance is so important for the human being that previous work has shown that up to 50% of patients with severe eczema or 49% of psoriasis patients would be willing

to employ two or more hours each day in their treatment if this would allow them to have a normal skin during the rest of the day.<sup>7,8</sup>

In the dermatology field, the search for a better QOL expressed in terms of a better skin perception or in the improvement of the image that we project to others has become more apparent in recent years in both women and men.<sup>9</sup> Additionally, skin diseases can alter very relevant aspects such as sexuality, the performance of certain tasks or they can even lead to work inability.<sup>10</sup>

Among the skin diseases that mostly affect self-image and QOL (including those related to the visible areas of the skin), are acne vulgaris, vitiligo and hair loss,<sup>11-13</sup> and also those that can affect the whole body and are also accompanied by itching or burning symptoms such as psoriasis or atopic dermatitis.<sup>7,14</sup>

Several instruments have been developed to measure QOL in dermatology.<sup>15-18</sup> The Skindex-29 instrument was developed in the United States by Chren et al.<sup>18</sup> It has been validated in the American population in whom it

demonstrated good measurement properties, as it was found to be internally consistent (Cronbach's  $\alpha = 0.87\text{--}0.96$ ) and replicable.<sup>19</sup> The original version and the translated and adapted version in Spain of this instrument have both demonstrated construct and content validity as higher scores have been reported in patients with eczema and psoriasis than in those with isolated skin lesions.<sup>18,20,21</sup> In addition, the Skindex-29 version from Spain and its Colombian version have also demonstrated construct validity and a high test–retest reliability.<sup>20–22</sup>

As skin disease perception and impact among patients could vary from one country to another, the aim of this study was to quantify such patient-reported effects in Colombian patients.

## Methods

A cross-sectional, non-interventional study was performed at 7 main and 34 smaller cities in Colombia. Due to the descriptive nature of the study, data of the percentage of patients' refusal to participate was not considered. Inclusion criteria corresponded to individuals older than 18 years, of any gender, and with any skin disease. Biopsy confirmation of skin disease was not mandatory. Eligible patients also had to express their willing to participate in the study and had to fill out an informed consent.

Exclusion criteria corresponded to patients with any mental and/or physical, psychological, or psychiatric disability that could interfere with skin disease perception or the self-reporting of the questionnaire.

In this study, no control group was planned for comparison, as the burden of skin diseases in our culture was previously demonstrated in the studies of cross cultural adaptation and validation of the instrument<sup>22,23</sup> where such type of group was included.

Sociodemographic characteristics such as age; gender; education level; living place; time-lapse of skin disease (in months or years); socioeconomic classification; social security type, and personal history of comorbidities were included in the analyses.

In respect to socioeconomic classification, the study classified patients according to the National Administrative Department of Statistics (DANE),<sup>23</sup> a Colombian stratification which has been based on public services payment related to housing type and its urban or rural environment. Such variables have been statistically proved by DANE to be a good surrogated marker for individual's or family income. Therefore, classification has been stratified as follows: Stratum 1: Low–Low; Stratum 2: Low; Stratum 3: Medium–Low; Stratum 4: Medium; Stratum 5: Medium–High; Stratum 6: High.<sup>23</sup>

Moreover, the study based patients' social security classification according to the Colombian general social security health system,<sup>24</sup> which operates in two main affiliation regimes: the contributory scheme (employees, independent workers) and the subsidized regime (poorest people). There is also a special regime which includes the military force, the police, all school teachers and the Colombian national petroleum company (Ecopetrol). Lastly, according to people's will and economic capacity, individuals can choose to pay for the provision of any health service (private patients).

## Instrument

The validated Colombian version of the Skindex-29<sup>®25</sup> was applied to consecutive dermatology patients attending any outpatient clinic, any private practice, or any health institution in the country. Both the informed consent and the questionnaire were handled to each patient for self-response before consultation. Sociodemographic variables and diagnosis of skin condition were completed by the attending physician after the consultation.

The Colombian skindex-29 version contains 29 consecutive items, and as the original instrument, it covers 3 domains: symptoms, emotions and functioning. Each item is rated on a 5-point Likert scale (never, rarely, sometimes, often, at all times), and higher scores reflect greater QOL impairment.

The instrument was monitored in each health institution, clinic or office by a certified dermatologist whom was in charge of verifying data completeness.

## Data analyses

Sample size was calculated according to the following equation based on the mean estimate:

$$n = \frac{Z_{0.975}^2}{e^2} \times \sigma^2$$

where "e" was the maximum expected statistical error for this study (value: 3), a confidence interval of 95% and a standard deviation  $\sigma$  of 20.77 extracted from the overall score obtained in the validation process of the Colombian version of Skindex-29<sup>®</sup>.<sup>22</sup> These calculations resulted in a sample size of 217 patients per institution or dermatologist, with an adjustment for a 15% patient's loss.

To ensure the quality of the data, all the information collected on printed questionnaires were double-typed by a research assistant. For that purpose, the Microsoft Access<sup>®</sup> 2010 (Microsoft Corporation, Redmond, WA) software was used. Questionnaires with any missing value in the Skindex-29 scale were excluded.

All responses of the entire instrument were transformed to a linear scale ranging from 0 to 100. Normality of data was assessed using the Kolmogorov–Smirnov test. A univariate analysis was performed, and for qualitative variables absolute and relative frequencies were used, whereas quantitative variables were analyzed utilizing central tendency and dispersion measurements. Differences between proportions were assessed using the Chi<sup>2</sup> test or Fisher exact test, as required.

The Kruskal–Wallis or Mann–Whitney *U* tests were used to determine whether there were QOL scores differences for groups by sociodemographic variables. Data analysis was performed with the SPSS software, version 19.0.

## Results

A total of 4340 questionnaires were sent to 29 Colombian dermatologists who agreed to participate as investigators and data monitors, and 2102 were returned. Of these, 206

were returned with incomplete data leaving a total of 1896 valid questionnaires for the analyses.

There were no significant differences in sociodemographic characteristics such as socioeconomic classification, level of education and gender when the group of individuals who returned the questionnaire incomplete when compared to the ones who completed the survey and returned it ( $p > 0.13$ ; Chi<sup>2</sup> Test).

More women than men responded the questionnaire (65.9% vs. 34.1%, respectively) (Table 1), and the mean age of participants was 41.5 years (standard deviation: 16.8, range: 18–91 years). There were no statistical differences in the global (median score: 21.5 vs. 19.8;  $p = 0.37$ ), symptoms (median score: 24.5 vs. 24.9;  $p = 0.71$ ) and emotions (median score: 30 vs. 30;  $p = 0.32$ ) Skindex-29 domains when men and women were compared respectively, whereas statistical differences were found in the function domain (median score: 10.4 vs. 8.3;  $p = 0.04$ ; Kruskal–Wallis test) (Table 2).

Furthermore, and regarding the age of participants, statistical differences were found in the global ( $p = 0.00$ ), function ( $p = 0.001$ ) and emotions ( $p = 0.00$ ) Skindex-29 domains, whereas non statistical differences were found only in the symptoms domain ( $p = 0.66$ ; Kruskal–Wallis test) (Table 2).

As described in Table 1, more than half of the population was under 39 years old (51.4%) and with some level of education (81.8%), although with a lower socioeconomic (SE) classification (64.8%). Statistical differences of QOL scores in all domains were found in SE classification ( $p = 0.00$ ) and the level of education ( $p = 0.00$ ), whereas no differences were found for social security classification ( $p = 0.06$ ; Kruskal–Wallis test) (Table 2).

The highest Skindex-29 scores were found in psoriasis (global median score: 35.3 symptoms: 38; emotions: 42.7 and function: 27.5); contact dermatitis (global median score: 32.1 symptoms: 37.9; emotions: 38.7 and function: 23); atopic dermatitis (global median score: 29.6 symptoms: 42.8; emotions: 34.3 and function: 18); urticaria (global median score: 34 symptoms: 33.9; emotions: 43 and function: 26.6); and condylomas or anogenital warts (global median score: 38.2 symptoms: 31.1; emotions: 47.7 and function: 34.4) (Table 3).

When skin diseases were grouped according to the localization of lesions (face, hands, feet or non-exposed areas), or according to the inflammatory or non-inflammatory nature of the disease, there were statistical differences of Skindex-29 scores in all domains ( $p = 0.00$ ; Kruskal–Wallis test/Mann–Whitney *U* Test) (Table 2).

Similarly, Skindex-29 scores in all domains were statistically different when non-treated patients vs. treated patients were compared respectively: (global median score: 22.4 vs. 18.9;  $p = 0.00$ ), symptoms (median score: 24.9 vs. 21.4;  $p = 0.03$ ), emotions (median score: 32.5 vs. 27.5;  $p = 0.00$ ) and function (median score: 10.4 vs. 8.3;  $p = 0.00$ ; Mann–Whitney *U* Test) (Table 2).

## Discussion

Patient-reported outcomes have become very relevant in clinical research in the last decades. Among these, quality of life emerges as one of the most important endpoints to be

evaluated, as it has been required by regulatory agencies to be included not only as a primary endpoint in clinical trials, but also as a “must” outcome to be evaluated in systematic reviews and metanalysis.<sup>26,27</sup>

To date there is no standard approach for the Interpretation of Skindex-29 scores. Anchor-based and distribution-based methods have been used, with some remarkable differences in the categorization of scores when both methods are compared.<sup>28–32</sup> However, if we round-off the cutoffs for mild ( $\geq 20$ ), moderate ( $\geq 30$ ) and severe ( $\geq 40$ ) impairment as suggested by Prinsen et al., according to obtained results, psoriasis, contact dermatitis, atopic dermatitis, urticaria, hair disorders, Hansen’s disease, scars, hyperhidrosis and genital human papillomavirus disease are among the skin illnesses that have a major impact in QOL in Colombia. Furthermore, even the most localized or asymptomatic skin lesion may lead to a disruption at some level of patient’s wellness. Such findings are in agreement with previous reports<sup>21,33</sup> and with others in which some of these skin disorders (namely psoriasis, atopic dermatitis) are perceived by patients as equally concerning as having hypertension, diabetes, asthma, cystic fibrosis or depression.<sup>34,35</sup>

The majority of interviewed patients were of ages between 18 and 49 (68%). Such finding not only reinforces exhaustive previous work<sup>2,36,37</sup> but is also very relevant in this study, as this is the age at which individual’s productivity and labor could be more affected by an impaired QOL.

Regarding other sociodemographic characteristics, more women participated in the study, a finding that is not unusual, as several studies have shown that women seek more frequently a dermatologist than men.<sup>38–40</sup> But interestingly, statistical differences were only found in the function domain when both groups were compared. This result could be explained by differences in the kind of job performed either by men or women, as it could be hypothesized that this domain could be perceived more impaired by men, particularly when physical work is an important task in their jobs. Importantly, the majority of participants did not have a co-morbidity, a characteristic that if presented, might have influenced final QOL scores. Another interesting finding was that participants’ age did affect Skindex-29 scores, except for the symptoms domain. Such result has been reported before in other studies<sup>41,42</sup> and could be explained by the fact that a symptom (i.e. itch) is decoded by the human brain in the same way either in a young person or in an old individual, whereas emotions and function could be more related to patient’s context and job-type in accordance with age.

According to our results, skin disease duration in the majority of participants was  $> 1$  year, a fact that could explain higher Skindex-29 scores particularly in patients with chronic cutaneous disorders. This result is consistent with previous reports which have demonstrated that QOL is more impaired in long-standing disease.<sup>43–45</sup>

Regarding the level of education, most of the included individuals finished either high school, college or had a university degree. Although the level of education of the Colombian population tends to be lower, this could be explained by the inclusion in the study of an important number of patients with contributive social security which in our country usually corresponds to people having a formal job, therefore it represents a better income. However, the

**Table 1** Sociodemographic characteristics of included patients.

Variable	Number of patients (n)	Percentage of patients (%)
<i>Age</i>		
18–29 years old	592	31.2%
30–39 years old	383	20.2%
40–49 years old	312	16.5%
50–59 years old	286	15.1%
≥60 years old	323	17%
<i>Gender</i>		
Male	647	34.1%
Female	1249	65.9%
<i>Level of education in years</i>		
≤5 years (elementary school)	345	18.2%
6–11 years (primary school and high school)	468	24.7%
12–20 years (technology or university studies)	1032	54.4%
≥21 years (postgraduate studies)	51	2.7%
<i>Living-place</i>		
Main cities	1202	63.4%
Rural area	694	36.6%
<i>Timelapse of skin disease since diagnosis</i>		
Less than a month	44	2.3%
1–3 months	107	5.6%
4–11 months	282	14.9%
1–2 years	481	25.4%
>2 years	742	39.1%
Missing	240	12.7%
<i>Socioeconomic classification</i>		
Stratum 1 (lower income)	216	11.4%
Stratum 2	460	24.3%
Stratum 3	551	29.1%
Stratum 4	314	16.6%
Stratum 5	169	8.9%
Stratum 6 (highest income)	124	6.5%
Missing	62	3.3%
<i>Social security classification</i>		
Contributory	1150	60.7%
Subsidized	334	17.6%
Private patient	206	10.9%
Special regime	100	5.3%
Unknown	43	2.3%
Missing	63	3.3%
<i>Associated co-morbidities</i>		
Yes	762	40.2%
No	1133	59.8%
Missing	1	0.1%

distribution of participants according to the socioeconomic status was more in agreement with Colombian current statistics and stratification.<sup>23</sup> Interestingly, significant differences of QOL scores were shown for socioeconomic and education level. However, such finding is not surprising as schooling level in Colombia is highly dependent on income.

Importantly, the inflammatory nature of skin disease and its localization (e.g. exposed areas) impacted QOL scores of participants, a finding that has been reported in other countries<sup>21,46,47</sup> and that is also in agreement with clinical

practice. Similarly, having a treatment or not leads to significant differences in Skindex-29 scores, a result that also agrees with dermatology practice.

Although questionnaire return rate was low (only 52%), sociodemographic characteristics of the non-returning vs. the returning group were similar and overall missing information rate was low. Therefore, in our opinion, this result was more due to Dermatologists scarce time to interview patients during their regular practice with busy waiting rooms rather than to methodological issues, as most health institutions in Colombia (with some exceptions) do not have

**Table 2** Median Skindex-29 scores according to gender, level of education, socioeconomic classification, social security classification, skin disease type, affected skin areas, previous treatment and timelapse of skin disease since diagnosis.

Variable	Global scores (median)	<i>p</i> Value*	Symptoms domain scores (median)	<i>p</i> Value*	Emotions domain scores (median)	<i>p</i> Value*	Function domain scores (median)	<i>p</i> Value*
<b>Age</b>								
18–29 years old	23.2		24.9		35		10.4	
30–39 years old	20.6		21.4		32.5		10.4	
40–49 years old	22.4	0.00	24.9	0.66	30	0.00	10.4	0.00
50–59 years old	18.1		21.4		25		8.3	
≥60 years old	16.3		21.4		20		6.2	
<b>Gender</b>								
Male	21.5	0.37	24.9	0.71	30	0.32	10.4	0.04
Female	19.8		24.9		30		8.3	
<b>Level of education in years</b>								
≤5 years (elementary school)	29.3		28.5		42.5		16.6	
6–11 years (primary school/high school)	22.4		24.9		33.7		8.3	
12–20 years (Technology/university studies)	18.9		21.4		30		6.2	
≥21 years (postgraduate studies)	15.5	0.00	19.6	0.00	16.2	0.00	10.4	0.02
<b>Socioeconomic classification</b>								
Stratum 1 (lower income)	21.5		24.9		30		10.4	
Stratum 2	22.4		28.5		32.5		8.3	
Stratum 3	23.2	0.00	24.9	0.00	32.5	0.00	12.4	0.00
Stratum 4	18.1		21.4		25		8.3	
Stratum 5	16.3		21.4		25		6.2	
Stratum 6 (highest income)	17.6		21.4		27.5		4.1	
<b>Social security classification</b>								
Contributory	20.6		21.4		30		8.3	
Subsidized	22.4	0.06	24.9	0.43	32.5	0.08	10.4	0.11
Private patient	18.1		24.9		27.5		8.3	
Special regime	25.8		28.5		35		14.5	
Unknown	22.4		32.1		27.5		10.41	
<b>Skin disease type</b>								
Inflammatory/generalized	25.8		28.5		37.5		12.4	
Non-inflammatory/localized	16.3	0.00	17.8	0.00	22.5	0.00	6.2	0.00
<b>Skin areas affected</b>								
Face/neck	18.9		21.4		30		8.3	
Arms/hands	23.2	0.00	28.5	0.00	30		12.4	
Non-exposed areas	22.8		28.5		32.5	0.04	10.4	0.02
Feet	18.1		21.4		25		6.2	
<b>Previous treatment</b>								
Yes	22.4		24.9		32.5		10.4	
No	18.9	0.00	21.4	0.03	27.5	0.00	8.3	0.00
<b>Time-lapse of skin disease since diagnosis</b>								
Less than a month	18.1		21.4		26.2		8.3	
1–3 months	21.1	0.04	24.9	0.31	30	0.00	8.3	0.00
4–11 months	18.1		24.9		25		8.3	
1–2 years	20.6		24.9		30		10.4	
>2 years	24.9		24.9		35		12.4	

**Table 3** Global, symptoms, emotions and function Skindex scores according to skin disease.

Diagnoses**	<i>n</i>	Skindex global median score (standard deviation)	Symptoms domain median (standard deviation)	Emotions domain median (standard deviation)	Function domain median (standard deviation)
Acne	324	29.5 (19.5)	27.4 (19.2)	42 (25)	20.4 (20.5)
Contact dermatitis	143	32.1 (22)	37.9 (24.1)	38.7 (26)	23 (23.4)
Melasma	120	20.1 (16.6)	17.3 (16.3)	30 (20.4)	15 (19)
Psoriasis	111	35.3 (20.1)	38 (20.3)	42.7 (24.1)	27.5 (24.4)
Benign skin tumors (nevi, dermatofibroma, etc.)	107	17.3 (17.9)	19 (20)	24.4 (22.5)	10.3 (18.3)
Vitiligo	99	21.5 (16.2)	19.2 (17.3)	32.9 (23.1)	13.4 (17)
Seborrheic dermatitis	82	23.5 (16.1)	28.8 (18.8)	30.3 (21.1)	14.7 (15.8)
Basal cell carcinomas	75	19.9 (17.5)	21.7 (18)	26.7 (22)	13.1 (17.4)
Facial photodamage	67	8.4 (11)	13.3 (16.7)	10.5 (14.4)	3.8 (8.2)
Androgenetic alopecia	47	20.3 (15.2)	18.8 (18.1)	30.8 (23)	12.5 (16.5)
Seborrheic keratosis	43	18.4 (16.1)	19.8 (18.4)	25.5 (19.3)	11.8 (16.9)
Actinic keratosis	41	24.6 (23.5)	26.7 (22.3)	30.7 (28.3)	18.2 (25.1)
Rosacea	38	26.5 (25.2)	30.8 (24.7)	32.1 (28.7)	19.3 (25.8)
Atopic dermatitis	37	29.6 (21.8)	42.8 (24.9)	34.3 (24.7)	18 (22)
Urticaria	31	34 (23.5)	33.9 (24.6)	43 (27.4)	26.6 (25.4)
Onychomycosis	27	21.9 (19.2)	25.5 (21.8)	28.9 (24.1)	13.9 (17.9)
Post-inflammatory pigmentation	20	27.7 (16.3)	28.2 (16.5)	38.2 (21.1)	18.7 (18.5)
Telogen effluvium	19	26.9 (15.3)	29.9 (18.2)	39.1 (24)	15 (13.9)
Keloids	19	22.5 (15)	19.9 (18)	34.6 (20.6)	13.9 (15)
Hansen's disease	14	39.2 (23.1)	30.3 (17)	44.5 (27.4)	40 (24.6)
Xerodermia	14	24.1 (17.5)	30.1 (14.8)	29.4 (20.5)	16.2 (20.8)
Lichen Planus	14	25.7 (26)	27 (22.2)	30.2 (29.9)	21.1 (28)
Solar lentigos	14	20.7 (19.7)	20.9 (24.3)	28.2 (22)	14.3 (18.1)
Scars (non Keloid)	12	30.7 (23.9)	20.2 (22.3)	40 (29.3)	29.2 (27.1)
Warts	12	19.2 (19.6)	20 (18.4)	23.3 (19.2)	15.4 (23.1)
Alopecia areata	11	26.4 (17.4)	13.9 (15.7)	46.8 (26)	16.7 (16)
Hyperhidrosis	11	38.2 (17.4)	23.4 (25)	46.6 (22.4)	40 (24.5)
Folliculitis/forunculosis	11	33.3 (27.4)	34.4 (26)	40.4 (29.2)	26.7 (30)
Keratosis pilaris	10	27.8 (16.3)	27.8 (20.2)	38.7 (23.4)	18.7 (19.3)
Condylomas	10	38.2 (28.3)	31.1 (26.8)	47.7 (34)	34.4 (27.5)
Patients with other diagnoses (less than 9 questionnaires)	313				
Total	1896				

\*\*  $n \geq 10$ .

time or trained personnel for performing research during outpatient consultation.

Limitations of our study include some variability in the scores of the studied population, a result that could be more related to differences in the localization of skin lesions, their inflammatory or non-inflammatory nature and the initiation of therapy, and not in the disease itself (e.g. a sudden loss of hair in the frontal area in a woman has a higher impact in QOL when compared to the gradual appearance of a small vitiligo lesion in a hidden area).

The strength of this study relies on a large sample that included patients with different socioeconomic status, level of education and social security as well as individuals not only from the majority of Colombian main cities, but also from rural areas. This research is also strengthened

by the fact that it is the first Colombian study that applied a formal validated dermatological QOL scale, becoming a valuable tool for global clinical practice, for the performance of local clinical trials, and for decision makers.

In conclusion, this study reinforces previous research regarding the burden of skin diseases in quality of life<sup>20,21,46</sup> and adds well-supported scientific data to health authorities.

Such contribution gains importance in countries where the health system has misinterpreted cutaneous disorders (unfortunately with few exceptions) as having a "cosmetic" origin instead of them being an organic disorder which could affect the individual's socialization, mental and physical health, and human wellness and satisfaction.

## Ethical disclosures

**Protection of human and animal subjects.** The authors declare that the procedures followed were in accordance with the regulations of the relevant clinical research ethics committee and with those of the Code of Ethics of the World Medical Association (Declaration of Helsinki).

**Confidentiality of data.** The authors declare that they have followed the protocols of their work center on the publication of patient data.

**Right to privacy and informed consent.** The authors have obtained the written informed consent of the patients or subjects mentioned in the article. The corresponding author is in possession of this document.

## Funding

This study has been sponsored by the Asociación Colombiana de Dermatología y Cirugía Dermatológica (Asocolderma). The administration and logistics of the study were both performed by Fundación Dermabase.

## Conflict of interest

The authors declare no conflict of interest.

## Annex 1. The Asociación Colombiana de Dermatología y Cirugía Dermatológica (Asocolderma) includes the following authors

María-del-Pilar Villegas, MD (Private practice office, Pereira, Colombia)  
 Martha-Susana Ramírez, MD (Somes, Bucaramanga, Colombia)  
 Rosario Betancourt, MD (Private Practice office, Sincelejo, Colombia)  
 Liliana Tamayo, MD (Universidad Pontificia Bolivariana, Medellín, Colombia)  
 Mónica Gaviria M, MD (Universidad Pontificia Bolivariana, Medellín, Colombia)  
 Joaquín Berrio J, MD (Facultad de Medicina, Universidad del Quindío, Armenia, Colombia)  
 Roberto Díaz, MD (Private Practice office, Sincelejo, Colombia)  
 Mufith Salaiman, MD (Private Practice office, Sincelejo, Colombia)  
 María-Victoria Hoyos, MD (Private Practice office, Sincelejo, Colombia)  
 Gabriel Matamoros, MD (Private Practice office, Cúcuta, Colombia)  
 Celmira Vargas, MD (Centro Dermatológico Federico Lleras Acosta, Bogotá, Colombia)  
 Edwin Bendek, MD, PhD (Centro Dermatológico Federico Lleras Acosta, Bogotá, Colombia)  
 Raquel Eraso, MD (Centro Dermatológico Federico Lleras Acosta, Bogotá, Colombia)  
 María-Victoria Franco, MD (Centro Dermatológico Federico Lleras Acosta, Bogotá, Colombia)

Maria-Isabel Barona, MD (Centro Medico Imbanaco, Cali, Colombia)  
 Lucia Montes, MD (Private Practice office, Sincelejo, Colombia)  
 Gener-Alejandro Mancilla, MD (Grupo de Investigación Dermatológica (GRID), Medellín; Centros Especializados San Vicente Fundación, Rionegro, Colombia)  
 Eucaris Meza, MD (Private Practice office, Sincelejo, Colombia).

## References

- McKoy K. The importance of Dermatology in global health. [Accessed June 3, 2015]. Available from: <http://origin.library.constantcontact.com/download/get/file/1102459510253-36/McKoy+The+Importance+of+Dermatology+in+Global+Health.pdf>
- Dehkharghani S, Bible J, Chen JG, Feldman SR, Fleischer AB. The economic burden of skin disease in the United States. *J Am Acad Dermatol.* 2003;48:592–9.
- Potocka A, Turczyn-Jabłońska K, Kieć-Swierczyńska M. Self-image and quality of life of dermatology patients. *Int J Occup Med Environ Health.* 2008;21:309–17.
- Potocka A, Turczyn-Jabłońska K, Merez D. Psychological correlates of quality of life in dermatology patients: the role of mental health and self-acceptance. *Acta Dermatovenerol Alp Pannonica Adriat.* 2009;18:53–8.
- Schimmack U, Radhakrishnan P, Oishi S, Dzokoto V, Ahadi S. Culture, personality, and subjective well-being: integrating process models of life satisfaction. *J Pers Soc Psychol.* 2002;82:582–93.
- Finlay AY, Ryan TJ. Disability and handicap in dermatology. *Int J Dermatol.* 1996;35:305–11.
- Finlay AY, Coles EC. The effect of severe psoriasis on the quality of life of 369 patients. *Br J Dermatol.* 1995;132:236–44.
- Finlay AY. Quality of life in atopic dermatitis. *J Am Acad Dermatol.* 2001;45:S64–6.
- Jones-Caballero MPP. Calidad de vida (II). Calidad de vida en Dermatología. *Acta Dermosifiliogr.* 2002;93:481–9.
- Szabo S. The World Health Organization Quality of Life (WHO-QOL) Assessment Instrument. In: Spilker B, editor. *Quality of life and pharmacoeconomics in clinical trials.* New York: Lippincott-Raven; 1996. p. 355–62.
- Klassen AF, Newton JN, Mallon E. Measuring quality of life in people referred for specialist care of acne: comparing generic and disease-specific measures. *J Am Acad Dermatol.* 2000;43 2 Pt 1:229–33.
- Williamson D, Gonzalez M, Finlay AY. The effect of hair loss on quality of life. *J Eur Acad Dermatol Venereol.* 2001;15:137–9.
- Choi S, Kim DY, Whang SH, Lee JH, Hann SK, Shin YJ. Quality of life and psychological adaptation of Korean adolescents with vitiligo. *J Eur Acad Dermatol Venereol.* 2010;24:524–9.
- Finlay AY. Coping with psoriasis. *BMJ.* Jun 1995;310:1673.
- Finlay AY, Khan GK, Luscombe DK, Salek MS. Validation of sickness impact profile and psoriasis disability index in psoriasis. *Br J Dermatol.* 1990;123:751–6.
- Finlay AY, Khan GK. Dermatology Life Quality Index (DLQI) – a simple practical measure for routine clinical use. *Clin Exp Dermatol.* 1994;19:210–6.
- Finlay AY. Quality of life assessments in dermatology. *Semin Cutan Med Surg.* 1998;17:291–6.
- Chren MM, Lasek RJ, Quinn LM, Mostow EN, Zyzanski SJ. Skindex, a quality-of-life measure for patients with skin disease: reliability, validity, and responsiveness. *J Invest Dermatol.* 1996;107:707–13.
- Chren MM, Lasek RJ, Flocke SA, Zyzanski SJ. Improved discriminative and evaluative capability of a refined version of Skindex,



- a quality-of-life instrument for patients with skin diseases. *Arch Dermatol*. Nov 1997;133:1433–40.
20. Jones-Caballero M, Peñas PF, García-Díez A, Badía X, Chren MM. The Spanish version of Skindex-29. *Int J Dermatol*. 2000;39:907–12.
  21. Jones-Caballero M, Peñas PF, García-Díez A, Chren MM, Badía X. The Spanish version of Skindex-29. An instrument for measuring quality of life in patients with cutaneous diseases. *Med Clin (Barc)*. 2002;118:5–9.
  22. Sanclemente G, García H-I, Aguirre D-C, Jones-Caballero M, Lugo L-H, Escobar C, et al. Fiabilidad y validez de constructo de la versión Colombiana del instrumento de Calidad de Vida Skindex-29 en Medellín, Colombia. *Iatreia*. 2017;30:21–33.
  23. Dane, Ministerio de Hacienda y Crédito Público. Evaluación de la estratificación socioeconómica como instrumento de clasificación de los usuarios y herramienta de asignación de subsidios y contribuciones a los servicios públicos domiciliarios. [Accessed Feb 10 2016]. Available from: <http://www.dane.gov.co/files/geoestadística/Evaluacion.Estratificaicon.pdf>
  24. Ministerio de la salud y Protección de Colombia. Aseguramiento al Sistema General de Salud. [Accessed Aug08 2016]. Available from: <https://www.minsalud.gov.co/proteccionsocial/Regimensubsubsidado/Paginas/aseguramiento-al-sistema-general-salud.aspx>
  25. Sanclemente G, Lugo LH, Medina L, Jones-Caballero M, García HI. Prueba para la adaptación cultural de la versión española del instrumento de calidad de vida dermatológico Skindex-29, en Colombia. *Rev Asoc Colomb Dermatol*. 2011;19:273–9.
  26. Centro Cochrane Iberoamericano. Manual Cochrane de Revisiones Sistemáticas de Intervenciones. Barcelona, Spain: Centro Cochrane Iberoamericano. 2012. Accessed 12 May 2015]. Available from: <http://www.cochrane.es/?q=es/node/269>
  27. Higgins J, Green S. Cochrane handbook for systematic reviews of interventions: the Cochrane Collaboration. 2011. [Accessed 5 Feb 2016] Available from: [www.cochrane-handbook.org](http://www.cochrane-handbook.org)
  28. Chren MM. Interpretation of quality-of-life scores. *J Invest Dermatol*. 2010;130:1207–9.
  29. Prinsen CA, Lindeboom R, Sprangers MA, Legierse CM, de Korte J. Health-related quality of life assessment in dermatology: interpretation of Skindex-29 scores using patient-based anchors. *J Invest Dermatol*. 2010;130:1318–22.
  30. Prinsen CA, Lindeboom R, de Korte J. Interpretation of Skindex-29 scores: response to Sampogna and Abeni. *J Invest Dermatol*. 2012;132:1500–1.
  31. Prinsen CA, Lindeboom R, de Korte J. Interpretation of Skindex-29 scores: cutoffs for mild, moderate, and severe impairment of health-related quality of life. *J Invest Dermatol*. 2011;131:1945–7.
  32. Nijsten T, Sampogna F, Abeni D. Categorization of Skindex-29 scores using mixture analysis. *Dermatology*. 2009;218:151–4.
  33. Paula HR, Haddad A, Weiss MA, Dini GM, Ferreira LM. Translation, cultural adaptation, and validation of the American Skindex-29 quality of life index. *An Bras Dermatol*. 2014;89:600–7.
  34. Morgan M, McCreedy R, Simpson J, Hay RJ. Dermatology quality of life scales—a measure of the impact of skin diseases. *Br J Dermatol*. 1997;136:202–6.
  35. Restrepo C, Escobar C, Mejía AM, Tamayo S, García HI, Lugo L-H, Sanclemente G. Instrumentos de evaluación de la calidad de vida en dermatología. *Iatreia*. 2013;26:467–75.
  36. Dalgard FJ, Gieler U, Tomas-Aragones L, Lien L, Poot F, Jemec GB. The psychological burden of skin diseases: a cross-sectional multicenter study among dermatological out-patients in 13 European countries. *J Invest Dermatol*. 2015;135:984–91.
  37. Sampogna F, Tabolli S, Abeni D. Impact of different skin conditions on quality of life. *G Ital Dermatol Venereol*. 2013;148:255–61.
  38. Tabora ML, Weber MB, Teixeira KA, Lisboa AP, Welter EQ. Evaluation of the quality of life and psychological distress of patients with different dermatoses in a dermatology referral center in southern Brazil. *An Bras Dermatol*. 2010;85:52–6.
  39. Baron SE, Morris PK, Dye L, Fielding D, Goulden V. The effect of dermatology consultations in secondary care on treatment outcome and quality of life in new adult patients with atopic dermatitis. *Br J Dermatol*. 2006;154:942–9.
  40. Kilkenny MF, Marks R. The frequency and nature of skin conditions seen in a private dermatology practice in central Victoria, 1991–95. *Australas J Dermatol*. 1996;37:550–3.
  41. Joshi SS, Ortiz S, Witherspoon JN, Rademaker A, West DP, Anderson R, et al. Effects of epidermal growth factor receptor inhibitor-induced dermatologic toxicities on quality of life. *Cancer*. 2010;116:3916–23.
  42. Sampogna F, Tabolli S, Giannantoni P, Paradisi A, Abeni D. Relationship between psychosocial burden of skin conditions and symptoms: measuring the attributable fraction. *Acta Derm Venereol*. 2016;96:60–3.
  43. Dominguez AR, Balkrishnan R, Ellzey AR, Pandya AG. Melasma in Latina patients: cross-cultural adaptation and validation of a quality-of-life questionnaire in Spanish language. *J Am Acad Dermatol*. 2006;55:59–66.
  44. Krüger C, Schallreuter KU. Cumulative life course impairment in vitiligo. *Curr Probl Dermatol*. 2013;44:102–17.
  45. Warlich B, Fritz F, Osada N, Bruland P, Stumpf A, Schneider G, et al. Health-related quality of life in chronic pruritus: an analysis related to disease etiology, clinical skin conditions and itch intensity. *Dermatology*. 2015;231:253–9.
  46. Janowski K, Steuden S, Bereza B. The Polish version of Skindex-29: psychometric properties of an instrument to measure quality of life in dermatology. *Postepy Dermatol Alergol*. 2014;31:12–20.
  47. He Z, Lu C, Chren MM, Zhang Z, Li Y, Ni X, et al. Development and psychometric validation of the Chinese version of Skindex-29 and Skindex-16. *Health Qual Life Outcomes*. 2014;12:190.