



## ORIGINAL ARTICLE

# Differences Between Men and Women in Chronic Scratching: A Psychodermatologic Study in Lichen Simplex Chronicus



R. Martín-Brufau<sup>a,\*</sup>, C. Suso-Ribera<sup>b</sup>, C. Brufau Redondo<sup>c,d</sup>, J. Corbalán Berná<sup>a</sup>

<sup>a</sup> Faculty of Psychology, University of Murcia, Spain

<sup>b</sup> Faculty of Psychology, University of Barcelona, Spain

<sup>c</sup> Service of Dermatology, Hospital Reina Sofía, Murcia, Spain

<sup>d</sup> Faculty of Medicine, University of Murcia, Spain

Received 2 March 2016; accepted 11 December 2016

Available online 2 February 2017

### KEYWORDS

Pruritus;  
Psychiatric  
Dermatology;  
Psycho-dermatology;  
Neurodermitis

### Abstract

**Introduction:** Chronic scratching is common to many skin disorders. Being a female and presenting a high level of psychopathology are risk factors for chronic scratching. Yet, it is unclear why. Certain personality characteristics that are more prevalent in women are also known to influence emotional states (i.e. emotional tension).

**Objective:** The present study aims to explore whether these personality styles might help understand why gender and emotional distress are associated with scratching.

**Material and methods:** We compared the personality patterns of 103 patients (69.9% women) diagnosed with Lichen Simplex Chronicus, against a sample of healthy individuals.

**Results:** Significant differences were found in the personality styles of men and women with LSC. Women were more pessimistic, oriented to fulfil the needs of others, traditional, insecure, submissive, and reserved, with moderate ( $d = .43$ ) to strong ( $d = .96$ ) size effects ranges. Some of these differences, such as in traditionalism, dutifulness, other-orientation, and pessimism, were also observed when compared with healthy men and women, with small ( $d = .03$ ) to moderate ( $d = .47$ ) size effects ranges.

**Conclusions:** These psychological factors may help explain the mechanisms underlying gender differences in chronic scratching, at least in Lichen Simplex Chronicus. The findings might open new avenues for research and treatment.

© 2017 AEDV. Published by Elsevier España, S.L.U. All rights reserved.

\* Corresponding author.

E-mail address: [ramonmail@gmail.com](mailto:ramonmail@gmail.com) (R. Martín-Brufau).

**PALABRAS CLAVE**

Prurito;  
Dermatología  
psiquiátrica;  
Psicodermatología;  
Neurodermitis

## Diferencias de personalidad entre hombres y mujeres con liquen simple crónico. Implicaciones para la conducta de rascado crónico

**Resumen**

**Introducción:** El rascado crónico es común a varias enfermedades dermatológicas. Ser mujer y presentar niveles elevados de psicopatología son factores de riesgo para el rascado crónico. Sin embargo, aún se desconoce la causa de esta relación. Ciertas características de personalidad relacionadas con el estrés son más prevalentes en mujeres.

**Objetivo:** Explorar si los estilos de personalidad pueden explicar las diferencias entre hombres y mujeres en las variables psicológicas asociadas con el rascado crónico.

**Material y métodos:** Comparamos los perfiles de personalidad de 103 pacientes (69,9% mujeres) diagnosticados de liquen simple crónico y una muestra de sujetos sanos.

**Resultados:** Se encontraron diferencias estadísticamente significativas entre hombres y mujeres con liquen simple crónico, siendo las mujeres más pesimistas, orientadas a los demás, tradicionales, inseguras, sumisas y reservadas en cuanto a sus emociones negativas, con rangos del tamaño del efecto entre moderados ( $d=0,43$ ) y altos ( $d=0,96$ ). También se encontraron entre la muestra de liquen simple crónico y los controles, como por ejemplo en tradicionalismo, sumisión, orientación al otro y pesimismo, con rangos del tamaño del efecto entre bajos ( $d=0,03$ ) y moderados ( $d=0,47$ ).

**Conclusiones:** Estos hallazgos podrían ayudar a explicar los mecanismos subyacentes a las diferencias de sexo en rascado crónico, al menos en el liquen simple crónico.

© 2017 AEDV. Publicado por Elsevier España, S.L.U. Todos los derechos reservados.

**Introduction**

Some dermatologic disorders are characterized by a desire to scratch excessively, which harms the skin and delays its recovery. Researchers have tried to elucidate why excessive scratching occurs. For example, it is known that gender is a risk factor to most dermatologic diseases. Specifically, there are twice as many women with pruritic dermatological diseases compared to men.<sup>1,2</sup> Also, women scratch more than men<sup>2</sup> and burning process and itch sensations occur differently than in men, although no differences in specific differential pathways in the primary afferent nerves have been found.<sup>3</sup>

Together with gender differences in dermatologic diseases, increased evidence has also pointed to the importance of emotional factors in the onset and evolution of dermatologic conditions. For example, experimentally induced negative affect has been associated with increased sensitivity to itch.<sup>4</sup> Also, perceived stress is known to be a vulnerability factor for dermatological diseases<sup>5</sup> and itch symptoms.<sup>6</sup> Research suggests that, as emotional tensions occur, itching and scratching increase.<sup>7</sup> Congruent with the above, higher rates of emotional problems are found in dermatologic disorders.<sup>8</sup> For instance, approximately one third of patients with dermatologic disorders also shows signs of psychiatric comorbidities.<sup>9</sup> Emotional factors might also help understand gender differences in dermatologic diseases. For example, a study with 1037 patients with chronic pruritus revealed that female patients had a greater psychological burden compared to men.<sup>2</sup> Being a female appears to be related to poorer emotional well being which, in turn, co-occurs with scratching. The question is why do women present more emotional problems and scratch behaviour?

The fact that scratch, emotional disturbance, and gender are related suggests that there might be a common underlying factor. Interestingly, personality styles are independently related to the three. First, emotional reactions and maladaptive behaviour are influenced by personality.<sup>10</sup> In fact, personality styles have proven to be excellent predictors of health-related behaviours and emotional functioning in patients with multiple medical conditions.<sup>11-13</sup> Second, gender differences in personality are well known. For example, research has shown that women are more other-nurturing, hesitating, and submissive than men.<sup>14</sup> Finally, personality differences between patients with chronic itch conditions and healthy individuals have been found.<sup>15</sup> In fact, personality styles are argued to help explain the fluctuations of skin disease by influencing emotional distress and scratching behaviour.<sup>16</sup> Despite the above, it remains unclear whether personality styles can explain the co-occurrence of gender and emotional differences in patients with dermatologic diseases associated with chronic scratching.

Lichen Simplex Chronicus (LSC) is a prototype of a psychodermatologic disorder in which scratching is central. Patients with LSC cause or maintain inflammation (lichenification) of the skin by continuous and intense scratching, which in turn increases itch. Congruent with most psychodermatologic conditions, there are more women than men with LSC.<sup>7</sup> Also, this disease is associated with increased psychopathology.<sup>17</sup> In fact, its association with psychological factors is such that some psychodermatologists suggest that LSC is an emotional disorder with skin manifestations.<sup>18</sup>

The objective of the present investigation is to test whether personality styles can help to understand the higher prevalence of women and emotional problems in Lichen Simplex Chronicus, a dermatologic disease caused

by scratching. We expect to find gender differences in personality styles among patients with LSC. A secondary goal is to explore whether these differences also exist between patients with LSC and healthy individuals. We hypothesize that differences in personality characteristics will occur when comparing patients with LSC and healthy individuals. Specifically, we anticipate that female patients with LSC will be more oriented to others, conforming, and focused on emotions than male participants with the disease. We expect that these characteristics will also stand out in LSC patients when compared to healthy individuals with the same gender.

## Material and methods

### Study design

Cross-sectional with comparison group.

### Study population and sample

Patients diagnosed with LSC at the Dermatology Department of the Hospital Reina Sofia (Murcia, Spain) between 2010 and 2015 were included in the study. The representativity of the sample was ensured by the long recruitment period.

LSC was diagnosed based on the following inclusion criteria: one or more lichenified plaques, intense pruritus, accentuation of normal skin lines, often with a peripheral zone of closely set lichenoid papules and hyperpigmentation and/or frequent excoriation, localized in easily accessible areas, caused by repeated scratching, and in the absence of any other visible dermatological disease which justifies the itch on the LSC site. Those diagnosed with any other skin disease were excluded from the sample. In particular, patients diagnosed with atopic dermatitis or other pruritic conditions were excluded. Thus, only primary lichenification cases due to chronic scratching were included, according to the criteria of LSC.<sup>18</sup>

In order to compare some personality characteristics between the LSC group and the general population, we selected a large sample to validate the Millon Inventory of Personality Styles as the control group.<sup>19</sup> Validation of the Millon Inventory of Personality Styles was made across 8 different geographical regions in Spain with heterogeneous demographic characteristics in order to construct a representative sample of the Spanish adult population. This strategy has been previously used in other personality studies.<sup>15,16</sup>

### Assessment of personality

The Millon Inventory of Personality Styles (MIPS) was used to assess personality styles. The MIPS evaluates three dimensions of normal personality: motivational goals, cognitive modes, and interpersonal strategies. Motivational styles evaluate the emotional goals that determine an individual's behaviour (i.e. oriented to oneself or to others). Cognitive styles assess thinking processes related to how information about the world is gathered and organized (i.e. decisions based on emotions and feelings or based on concepts and thoughts). The Interpersonal styles referred to the way a

person interacts with others (i.e. submissive or dominant with others).<sup>19</sup>

The questionnaire consists of 180 true-false items divided in 24 bipolar scales (6 for motivational goals, 8 for cognitive modes, and 10 for interpersonal strategies). Although the MIPS was conceived as a personality assessment tool for general population, and not specifically in dermatological patients, it has been used to study the psychological variables that modulate the health status and to identify adaptive styles<sup>20</sup> in relation to gender differences,<sup>14</sup> showing good psychometric properties, and proving being a useful tool for our study.

### Statistical analysis

To test whether gender differences in personality styles existed, we compared the means of men and women with LSC. In order to explore if personality styles may be risk factors for LSC, we compared the personality ratings of LSC patients with normative data on the MIPS matched by sex and age using t-tests, once the normal distribution of the personality scales were confirmed by the Kolmogorov–Smirnov test ( $p > .05$ ). The effect size was evaluated by Cohen's  $d$ , a standardized mean difference index. In order to interpret the magnitudes of the  $d$  index the following cut points are usually used: small effect  $d = 0.2$ , moderate effect  $d = 0.5$ , and strong effect  $d = 0.8$ .

### Ethics

The hospital ethics committee provided ethics approval. All patients who signed the informed consent form completed the questionnaire individually and returned it to their dermatologist.

### Results

103 patients diagnosed with LSC ( $M_{\text{age}} = 47.13$  years, range 13–84, 31.1% men) and 1184 healthy-normal controls ( $M_{\text{age}} = 37.60$  years, range 18–65 years, 45.7% men) were included in the study.

### Personality differences between men and women with LSC

Men and women with LSC differed in many personality styles (Table 1). Significant differences occurred in the three areas investigated: motivational goals, cognitive styles, and interpersonal strategies. Overall, women with LSC were more pessimistic, oriented to fulfil the needs of others, traditional, insecure, and submissive than men with the disease. Also, they had a higher tendency to cover their negative feelings from others. The strength of these differences ranged from moderate to strong.

### Personality differences between men with LSC and healthy men

Significant differences in personality styles were also observed between men with LSC and healthy males

**Table 1** Differences in means and standard deviations between men and women diagnosed with Lichen Simplex Chronicus (LSC) versus men and women without LSC. <sup>LSC</sup> Significant differences between men and women with LSC; <sup>♂</sup> Significant differences between men with and without LSC; <sup>♀</sup> Significant differences between women with and without LSC. Cohen *d* (standardized mean difference) was used to calculate the size effect or magnitude of the differences. Alpha level was set at 0.05.

|   | Men LSC <i>N</i> = 31<br>Mean ± SD | Women<br>LSC<br><i>N</i> = 72<br>Mean ± SD | Healthy men<br><i>N</i> = 550<br>Mean ± SD | Healthy women<br><i>N</i> = 634<br>Mean ± SD | <i>d</i> (Men-<br>Women<br>LSC) | <i>d</i> (Men both<br>samples) | <i>d</i> (Women<br>both<br>samples) |
|---|------------------------------------|--|--|--|---------------------------------|--------------------------------|-------------------------------------|
| <i>Motivation styles</i>                    |                                    |  |  |  |                                 |                                |                                     |
| 1A. Pleasure-enhancing                      | 65.0 ± 20.4                        | 56.1 ± 22.6                                | 63.1 ± 20.2                                | 61.1 ± 21.2                                  | 0.41                            | 0.09                           | -0.24                               |
| 1B. Pain-avoiding <sup>LSC♀</sup>           | 38.6 ± 25.9                        | 50.4 ± 25.1                                | 38.0 ± 21.2                                | 41.4 ± 23.5                                  | -0.47                           | 0.03                           | 0.38                                |
| 2A. Actively modifying <sup>LSC</sup>       | 59.5 ± 26.8                        | 45.5 ± 27.3                                | 52.5 ± 25.1                                | 48.8 ± 25.2                                  | 0.51                            | 0.28                           | -0.13                               |
| 2B. Passively accommodating <sup>LSC♀</sup> | 44.1 ± 24.4                        | 61.1 ± 24.2                                | 50.9 ± 25.1                                | 52.2 ± 25.2                                  | -0.70                           | -0.27                          | 0.35                                |
| 3A. Self-indulging <sup>LSC</sup>           | 54.4 ± 22.3                        | 42.9 ± 23.2                                | 58.9 ± 22.5                                | 46.4 ± 25.3                                  | 0.50                            | -0.20                          | -0.14                               |
| 3B. Other-nurturing <sup>LSC♂♀</sup>        | 57.1 ± 24.2                        | 67.1 ± 22.7                                | 45.0 ± 26.0                                | 57.1 ± 25.3                                  | -0.43                           | 0.47                           | 0.40                                |
| <i>Cognitive styles</i>                     |                                    |  |  |  |                                 |                                |                                     |
| 4A. Externally focused <sup>♂</sup>         | 57.7 ± 19.9                        | 50.1 ± 26.0                                | 45.9 ± 23.6                                | 50.8 ± 25.2                                  | 0.31                            | 0.50                           | -0.03                               |
| 4B. Internally focused <sup>♂</sup>         | 44.3 ± 21.0                        | 50.8 ± 26.7                                | 54.7 ± 24.4                                | 48.6 ± 25.5                                  | -0.26                           | -0.43                          | 0.08                                |
| 5A. Realistic/sensing <sup>♂</sup>          | 67.8 ± 21.3                        | 58.5 ± 24.5                                | 58.4 ± 26.7                                | 58.2 ± 26.1                                  | 0.39                            | 0.35                           | 0.01                                |
| 5B. Imaginative/intuiting <sup>♂</sup>      | 34.1 ± 20.8                        | 42.9 ± 22.1                                | 43.5 ± 26.2                                | 42.2 ± 25.5                                  | -0.41                           | -0.36                          | 0.03                                |
| 6A. Thought-guided <sup>LSC</sup>           | 55.1 ± 21.9                        | 37.3 ± 22.3                                | 58.4 ± 25.5                                | 41.8 ± 25.4                                  | 0.80                            | -0.13                          | -0.18                               |
| 6B. Feeling-guided <sup>LSC♀</sup>          | 47.3 ± 24.3                        | 68.2 ± 20.5                                | 45.7 ± 26.8                                | 56.0 ± 26.2                                  | -0.96                           | 0.06                           | 0.47                                |
| 7A. Conservation-seeking <sup>LSC♂</sup>    | 59.9 ± 22.3                        | 49.2 ± 24.3                                | 48.8 ± 24.9                                | 51.5 ± 26.1                                  | 0.46                            | 0.45                           | -0.09                               |
| 7B. Innovation-seeking <sup>♂</sup>         | 35.0 ± 20.4                        | 37.7 ± 23.5                                | 45.1 ± 26.4                                | 40.5 ± 26.1                                  | -0.12                           | -0.39                          | -0.11                               |
| <i>Interpersonal styles</i>                 |                                    |  |  |  |                                 |                                |                                     |
| 8A. Asocial/withdrawing                     | 50.0 ± 20.5                        | 51.5 ± 26.1                                | 53.4 ± 24.4                                | 48.2 ± 24.8                                  | -0.06                           | -0.14                          | 0.13                                |
| 8B. Gregarious/outgoing                     | 55.1 ± 23.8                        | 49.2 ± 25.9                                | 52.6 ± 25.3                                | 49.7 ± 24.4                                  | 0.23                            | 0.10                           | -0.02                               |
| 9A. Anxious/hesitating <sup>LSC</sup>       | 38.6 ± 21.2                        | 52.2 ± 25.0                                | 45.9 ± 24.1                                | 46.6 ± 25.4                                  | -0.57                           | -0.30                          | 0.22                                |
| 9B. Confident/asserting <sup>LSC</sup>      | 61.4 ± 18.1                        | 42.5 ± 26.7                                | 54.9 ± 24.7                                | 47.4 ± 26.1                                  | 0.77                            | 0.27                           | -0.19                               |
| 10A. Unconventional/dissenting <sup>♂</sup> | 36.4 ± 25.7                        | 40.0 ± 22.6                                | 48.1 ± 24.7                                | 39.7 ± 24.7                                  | -0.15                           | -0.47                          | 0.01                                |
| 10B. Dutiful/conforming <sup>♂♀</sup>       | 66.2 ± 24.3                        | 63.1 ± 26.2                                | 52.8 ± 25.1                                | 51.1 ± 24.4                                  | 0.12                            | 0.53                           | 0.49                                |
| 11A. Submissive/yielding <sup>LSC♀</sup>    | 40.9 ± 22.4                        | 53.2 ± 27.1                                | 44.8 ± 24.0                                | 45.7 ± 23.7                                  | -0.48                           | -0.16                          | 0.31                                |
| 11B. Dominant/controlling <sup>LSC♀</sup>   | 48.6 ± 25.3                        | 33.6 ± 23.2                                | 51.0 ± 25.6                                | 39.2 ± 26.6                                  | 0.63                            | -0.09                          | -0.21                               |
| 12A. Dissatisfied/complaining <sup>♂</sup>  | 36.5 ± 26.3                        | 47.9 ± 29.5                                | 46.7 ± 25.5                                | 42.8 ± 26.5                                  | -0.40                           | -0.40                          | 0.19                                |
| 12B. Cooperative/agreeing <sup>LSC♀</sup>   | 59.9 ± 24.0                        | 70.7 ± 19.5                                | 51.9 ± 24.8                                | 65.3 ± 26.2                                  | -0.52                           | 0.32                           | 0.21                                |

(Table 1). These mostly occurred in the cognitive and the interpersonal styles. In general, men with LSC were more traditional (higher score in conservative scale), more dutiful (higher score in dutiful/conforming scale), and were oriented to fulfil the needs of others than men without the disease (higher score in other-nurturing scale). They also relied more on other people than themselves for guidance. Differences were between small and moderate.

### Differences between women with LSC and healthy women

LSC women also presented differences in personality when compared to healthy females, especially in motivational and interpersonal styles (Table 1). Female patients with the disease were more pessimistic, oriented to fulfil the needs of others, self-controlled, and submissive. In addition, they had a higher tendency to cover their negative feelings from others. The strength of these differences ranged from small to moderate.

## Discussion

In the light of our results, there are personality differences between male and female patients with LSC, and also when they are compared with healthy individuals. Some, personality styles that are more frequent in females might be relevant risk factors for the chronic course of LSC. For example, women with LSC showed an increased tendency to be guided by feelings and emotions rather than by objective information when coping with stress. Surprisingly, they reported frequently hiding their negative emotions in order to cooperate and be in agreement with others. Congruent with these findings, previous research has revealed that women suppress the expression of emotions that they consider to be inconsistent with their gender role,<sup>21</sup> mainly aggression.<sup>22</sup> Most importantly, the use of this coping seems to reduce the ability to solve interpersonal conflicts,<sup>23</sup> possibly by increasing physiological arousal, and subjective states of emotional distress.<sup>24</sup> The above seems to hold true for patients with LSC, who present increased emotionality, difficulties in regulating their emotions and high levels of psychopathology.

Support for a stronger relationship between tension and scratching for women comes from those studies showing that emotional distress and psychopathology are associated with itching and scratching, and the link is stronger for women.<sup>25,26</sup> A relationship between stress and negative emotions is well established. For example, stressful situations have been associated with numerous negative emotions (i.e. anger, anxiety and depression). In LSC, scratching might be one form of reducing stress. Even though this is arguably a maladaptive form of coping with stress, the use of such coping efforts in front of stress is not new. Self-mutilation, for example, is a well-known form of passive coping.<sup>27</sup> These findings suggest that intense scratching, as shown in LSC, could act as a mild form of self-aggression. This might be one way of coping with stress in the absence of a better strategy to deal with emotional tension and increased arousal. Because personality styles tend to remain

stable, when these styles are maladaptive scratching may become chronic.

Our results suggest that the aforementioned pathway might be especially relevant for females. Personality differences in our study might explain, at least to some extent, the higher prevalence of women with chronic scratching. Interestingly, some of these differences also occurred in men with LSC, although only partially and in lower magnitude. For example, men with LSC were more other-oriented, less dissenting, more dutiful, and less complaining compared to healthy males. Therefore, these personality styles might not only be risk factors for the LSC in women, but for men. Another important finding in our study was that some personality differences between LSC patients and healthy individuals were gender-specific. While men differed in cognitive styles, women mostly differed in motivational styles. The components of interpersonal styles in which LSC patients and healthy individuals differed depend on gender too. This makes us think that different pathways might be intervening in chronic scratching, at least in LSC.

In the previous paragraph we noted that certain personality styles might be considered to be risk factors for LSC only in males. For example, men with the disease prefer objective information and other people's opinions than their own intuitions and thoughts for guidance (realistic vs. imaginative and externally vs. internally focused). In addition, LSC males are more traditional and systematic in the way they gather information, in opposition to creative and novelty seeking (conservation vs. innovation). In line with this, they report following traditional social standards (unconventional) and being very stable in the way they think, feel and behave (dissatisfied). In this sense, a research has revealed that men tend to be more rigid in the way they think and behave, and this rigidity is associated with psychopathology.<sup>28</sup> This might explain why this personality profile was more prominent in males with LSC in our sample.

This study certainly has some limitations. First of all, we used a cross-sectional design, which prevents us from drawing causal conclusions. That is, even if we found personality differences between LSC patients and healthy individuals, we cannot be sure that these personality styles are responsible for the onset of pathology. However, prospective research has shown this might be the case for many diseases.<sup>29</sup> Moreover, even if emotional reactions involved in LSC are partly attributable to certain personality styles, the relation between these and scratching remains unexplored. The fact that certain personality styles were more prevalent in people who scratch does not necessarily mean that one caused the other. For example, negative affective states (such as anxiety, depression or anger), a possible confounding variable, was not measured. In addition, the severity of the lesion, economic status, family disturbances, etc., could also trigger or maintain scratching behaviour and should be taken into account in future studies. It is also important to note that, although LSC is a good model of chronic scratching, our findings are not necessarily generalizable to other dermatological conditions. Another limitation of the current investigation is that the control group used for personality comparison was a sample collected in a previous investigation in which the existence

of dermatologic or mental problems was not assessed. While acknowledging this shortcoming, the sample assessed in the validation of the Millon Inventory of Personality Styles used a large population representative of the general population of Spain<sup>19</sup>; therefore, the present results may serve as indicators of personality differences between patients with LSC and people from the general population in Spain.

In summary, the present study suggests that personality styles should not be overlooked in the context of LSC, both in males and females. Our results suggest that certain adaptive styles increase the likelihood of behavioural responses (i.e. scratching) to stress through experiencing stressful situations and using maladaptive emotional regulation strategies (i.e. emotional suppression of unexpressed tension). As the specific mechanisms through which psychological variables influence the desire to scratch remain speculative, more studies addressing gender differences in personality should be carried out in dermatologic patients with chronic scratch behaviour. Moreover, we recommend assessing personality, especially in women, in order to detect patients with a higher risk of developing chronic scratching conditions. We suggest that the evaluation of personality should help to guide the treatment of patients with dermatologic conditions in which scratching is important.

## Ethical disclosures

**Protection of human and animal subjects.** The authors declare that no experiments were performed on humans or animals for this study.

**Confidentiality of data.** The authors declare that no patient data appear in this article.

**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.

## Conflict of interest

The authors declare that they have no conflict of interest.

## References

- Engin B, Uguz F, Yilmaz E, Özdemir M, Mevlitoglu I. The levels of depression, anxiety and quality of life in patients with chronic idiopathic urticaria. *J Eur Acad Dermatol Venereol*. 2008;22:36–40.
- Ständer S, Stumpf A, Osada N, Wilp S, Chatzigeorgakidis E, Pfeleiderer B. Gender differences in chronic pruritus: women present different morbidity, more scratch lesions and higher burden. *Br J Dermatol*. 2013;168:1273–80.
- Hartmann EM, Handwerker HO, Forster C. Gender differences in itch and pain-related sensations provoked by histamine, cowhage and capsaicin. *Acta Derm Venereol*. 2015;95:25–30.
- Niemeier V, Gieler U. Observations during itch-inducing lecture. *Dermatol Psychosom*. 2000;1:15–8.
- Osman OT, Mufaddel A, Almagaddam F, Augusterfer EF. The psychiatric aspects of skin disorders. *Expert Rev Dermatol*. 2011;6:195–209.
- Misery L. Interaction between pruritus and stress or other psychosomatic factors. In: Misery L, Ständer S, editors. *Pruritus* [Internet]. London: Springer; 2010. p. 206–9.
- Lotti T, Buggiani G, Prignano F. Prurigo nodularis and lichen simplex chronicus. *Dermatol Ther*. 2008;21:42–6.
- Hughes JE, Barraclough BM, Hamblin LG, White JE. Psychiatric symptoms in dermatology patients. *Br J Psychiatry J Ment Sci*. 1983;143:51–4.
- Gupta MA. Stress and urticaria. In: *Neuroimmunology of the Skin* [Internet]. Springer; 2009. p. 209–17.
- Cacioppo JT, Berntson GG. The brain, homeostasis, and health: balancing demands of the internal and external milieu. In: Silver RC, editor. *Foundations of health psychology*. New York, NY: Oxford University Press, Inc.; 2007. p. 73–91.
- Ozer DJ, Benet-Martínez V. Personality and the prediction of consequential outcomes. *Annu Rev Psychol*. 2006;57:401–21.
- Roberts BW, Kuncel NR, Shiner R, Caspi A, Goldberg LR. The power of personality. The comparative validity of personality traits, socioeconomic status, and cognitive ability for predicting important life outcomes. *Perspect Psychol Sci*. 2007;2:313–45.
- Turiano NA, Pitzer L, Armour C, Karlamangla A, Ryff CD, Mroczek DK. Personality trait level and change as predictors of health outcomes: findings from a national study of Americans (MIDUS). *J Gerontol B Psychol Sci Soc Sci*. 2012;67:4–12.
- Sánchez-López MP, Cuéllar-Flores I, Limiñana R, Corbalán J. Differential personality styles in men and women the moderating effect of gender conformity. *SAGE Open*. 2012;2:1–14.
- Martin-Brufau R, Corbalán-Berná J, Ramírez-Andreo A, Brufau-Redondo C, Limiñana-Gras R. Personality differences between patients with lichen simplex chronicus and normal population: a study of pruritus. *Eur J Dermatol*. 2010;20:359–63.
- Martin-Brufau R, Ulnik JC, Brufau Redondo C, Corbalán Berná F-J. Personality in patients with psoriasis. In: Soung J, Koo B, editors. *Psoriasis*. InTech; 2012. p. 209–26.
- Koca R, Altin R, Konuk N, Altinyazar HC, Kart L. Sleep disturbance in patients with lichen simplex chronicus and its relationship to nocturnal scratching: a case control study. *South Med J*. 2006;99:482–5.
- Harth W, Gieler U, Kusnir D, Tausk FA. Clinical management in psychodermatology. Springer; 2008. p. 73–4.
- Millon T. *Inventario de Estilos de Personalidad de Millon*, manual. Spanish adaptation: MP Sánchez-López, JF Díaz-Morales, & ME Aparicio-García. Madrid: TEA Ediciones; 2001. p. 67–71.
- Elena MJS, Montes JMG, Romera MV, Álvarez MP. Enfermedad crónica: satisfacción vital y estilos de personalidad adaptativos. *Clínica Salud*. 2014;25:85–93.
- Plant EA, Hyde JS, Keltner D, Devine PG. The gender stereotyping of emotions. *Psychol Women Q*. 2000;24:81–92.
- Cox DL, Stabb SD, Hulgus JF. Anger and depression in girls and boys. A study of gender differences. *Psychol Women Q*. 2000;24:110–2.
- Srivastava S, Tamir M, McGonigal KM, John OP, Gross JJ. The social costs of emotional suppression: a prospective study of the transition to college. *J Pers Soc Psychol*. 2009;96:883–97.
- Goldin PR, McRae K, Ramel W, Gross JJ. The neural bases of emotion regulation: reappraisal and suppression of negative emotion. *Biol Psychiatry*. 2008;63:577–86.
- van Laarhoven AIM, Walker AL, Wilder-Smith OH, Kroeze S, van Riel PLCM, van de Kerkhof PCM, et al. Role of induced negative and positive emotions in sensitivity to itch and pain in women. *Br J Dermatol*. 2012;167:262–9.
- Stumpf A, Ständer S, Warlich B, Fritz F, Bruland P, Pfeleiderer B, et al. Relations between chronic pruritus characteristics and psychological comorbidities of chronic pruritus differ between

- males and females – females are more anxious than males. *Br J Dermatol.* 2015;172:1323–8.
27. Andover MS, Pepper CM, Gibb BE. Self-mutilation and coping strategies in a college sample. *Suicide Life Threat Behav.* 2007;37:238–43.
  28. Schultz PW, Searleman A. Rigidity of thought and behavior: 100 years of research. *Genet Soc Gen Psychol Monogr.* 2002;128:165–207.
  29. Weston SJ, Hill PL, Jackson JJ. Personality traits predict the onset of disease. *Soc Psychol Personal Sci.* 2014;1:1–19.