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The Psychosocial Burden of Hand Eczema: Data from a European Dermatological Multicenter Study

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Summary

Background: The essential physical role, visibility and social importance of the hands pose a major psychological burden on patients with hand eczema.

Objectives: The aim of this study was to identify the psychological, social and clinical characteristics of patients with hand eczema, in particular the prevalence of depression, anxiety, suicidal ideation and comorbidities.

Materials and methods: Data on patients with hand eczema were analysed from a large European, multicenter, study conducted on dermatology outpatients from 13 countries. Groups of patients and controls were compared to analyse the psychological burden of hand eczema.

Results: Women patients with hand eczema had higher Hospital Anxiety and Depression Scale (HADS) scores for anxiety (n=86, median=7.0) than controls (n=900, 5.0, p=0.02), and for depression (median=4.0) than controls (3.0, p<0.001). Patients with high suicidal ideation, low socioeconomic status and who were widowed or divorced were more likely to fulfil the HADS criteria for anxiety [(Odds ratio (OR)>1, p=0.038, p<0.001 and p<0.001 respectively]. The median DLQI score was 7.0 (n=68).

Discussion: This study identifies a specific psychological burden experienced by hand eczema patients, highlighting the need for focused psychosocial interventions. In particular physicians should be aware of the need to identify anxiety and depression in women patients.

Key words: hand eczema; anxiety; depression; stress; psychosocial burden; gender differences; quality of life, outpatients

Introduction

Skin conditions and skin-related diseases are amongst the most common human illnesses, implying both a high prevalence and a wide range of detrimental psychical and psychological effects. The global impact of skin conditions collectively represents the fourth largest cause of nonfatal disease, as measured in years lost due to disability (1). In the literature, the high prevalence of skin conditions is well recognised (2, 3, 4), as is the strong association between psychiatric disorders and skin disease (5, 6, 7, 8). The full extent of psychological comorbidity from skin disease across Europe was revealed in a large European multicentre study (9). That study included patients with hand eczema, giving the opportunity to specifically analyse the psychosocial burden caused by hand eczema.

Hand eczema has a considerable impact in various workplace and professional settings. There is a significant association between having hand eczema and days lost through illness, with consequent social and economic effects (10, 11, 12, 13, 14, 15). There is also a three times higher prevalence than for non-sufferers of employment instability, sickness absence, disability, need for rehabilitation and early retirement in adults with hand eczema. Career disruption, lower income and financial losses due to the extra expenses incurred by having hand eczema have also been reported. The condition clearly has negative repercussions on quality of life and social interaction (14, 15, 16).

The incidence of hand eczema in children, adolescents, women of reproductive age and the elderly is greater than in adult men. The one-year prevalence of hand eczema has been estimated to be as high as 10% of the total population (13, 17, 18, 19). Hand eczema often becomes chronic (persisting >5 years). A highly complex set of genetic, developmental, environmental (exposure to allergens and irritants), professional, and lifestyle factors contribute to its aetiology and prognosis. Domestic conditions such as wet-work exposure, the use of detergents and cleaning products, taking care of small children at home and the use of protective measures may also play a role (20). The repercussions in the lives of those affected are therefore complex and may add to the difficulty of protecting the hands.

Assessing the burden of skin diseases in different segments of the population is crucial for evidence-based allocation of resources and to appropriately plan psychodermatology services in a global health perspective (21). An appropriate methodology for achieving this assessment is still to be agreed. Patients with skin disease should receive advice on how to cope with accompanying psychological and social difficulties (7, 8, 12, 14, 16, 22). An estimate of the prevalence of mental disorders among hand eczema patients (within the more general framework of other skin diseases) may contribute to a better understanding of the true impact of this disease.

The aim of this study was to assess the correlation of several psychosocial variables with the burden posed by hand eczema on patients. Different population characteristics of patients with hand eczema were compared to healthy controls. In addition depression, anxiety, general quality of life (QoL) and dermatology specific QoL were measured in comparison to controls, and confounding factors, including gender, and their correlations were assessed.

MATERIALS AND METHODS

Study design

This work is based on data from a European, multicenter, observational, cross-sectional study (9). Between November 2011 and February 2013, participants were recruited from dermatological outpatient clinics in 13 countries. At each clinic, consecutive patients were invited to participate on one or more random days until a study population of 250 was achieved. Inclusion criteria were: to be at least 18 years old; to be able to read and write the local language; and to not be suffering severe psychosis. Participants were asked to complete an initial questionnaire before undergoing a clinical examination.

All patients participating in the study were examined by a dermatologist, who recorded the main dermatological diagnosis and the severity of the condition; some patients had more than one skin disease. The presence of chronic comorbidities (cardiovascular disease; chronic respiratory disease; diabetes; rheumatic disease and/or any other chronic illnesses) was recorded. This information was asked by the dermatologist and then confirmed by checking the records. If there were doubts as to whether a skin disease was present (e.g. no diagnosis, no flare ups, and no itching) the patients were not included in the sample.

In each centre, a control group of at least 125 subjects was recruited from among hospital employees working at the same institution but not the same department. The control groups recruited at each participating center included hospital staff, both direct health care workers such as nurses and doctors, and administrative staff. Participation was voluntary. Employees with a skin condition were excluded. The employees were informed about the study and, after giving written consent, were invited to answer the questionnaire. They were not examined; information on comorbidities was self-reported. The methodology of data collection is described in more detail in (9).

Questionnaires

The initial questionnaire dealt with the following socio-demographic variables: Age; Gender (male, female); Marital Status (single, married/cohabiting, separated/divorced, widowed; Socioeconomic Status (low, middle, high), and Education (Primary, Secondary, Higher Education, University). Stress was assessed by the question: 'Have you experienced any stressful life events during the last 6 months?' Suicidal ideation was contemplated by the question: 'Have you ever thought of committing suicide?' Subjects were also asked whether or not they were experiencing any itch.

Symptoms of depression and anxiety (the main outcome variables) were assessed with the Hospital Anxiety and Depression Scale (HADS), a well-validated instrument with good psychometric properties regarding the presence and severity of anxiety disorders and depression (23, 24, 25). The HADS includes seven items concerning anxiety and seven concerning depression, each with four possible responses. For anxiety and depression, a score from 0 to 7 is considered as normal; from 8 to 10 is borderline; and 11 to 21 is a case that requires further examination or treatment. The instrument was used in the validated translations for the languages of the countries involved.

The Dermatology Life Quality Index (DLQI) (26) is the most frequently used instrument in randomised controlled dermatology studies. It is validated for adult

dermatology patients aged 16 and over. It consists of 10 questions concerning patients' perception of the impact of skin diseases on different aspects of their health related QoL over the last week, covering the domains: Symptoms and feelings, Daily activities, Leisure, Work and/or School, Personal relationships, and Treatment. Each response is scored on a 4-point Likert scale: Not at all/Not relevant (0); A little (1); A lot (2); Very much (3). Scores of individual items (0-3) are added to provide a total score of 0-30; higher scores mean a more impaired QoL (27).

The EQ-5D health questionnaire is a simple generic measure of health status for clinical and economic appraisal (28). It is applicable to a wide range of health conditions and treatments, offers a simple descriptive profile and a single index value for health status. The 5 dimensions of the EQ-5D descriptive system are divided into 3 levels of perceived problems: Level 1 (no problems); level 2 (some problems); and level 3 (extreme problems). An individual's state of health is defined by combining one level from each of the 5 dimensions; there are therefore $3^5 = 243$ possible definitions of a person's health status. The EQ VAS records participants' self-rated health on a vertical visual analogue 100-degree scale (0 = "worst imaginable health state"; 100 = "best imaginable health state").

Statistical analysis

In the multicenter dermatological study (9), statistical power was calculated on the basis of the prevalence of depression in the general population (estimated as 9%) and the higher prevalence expected in the population suffering dermatological conditions (29, 30).

Firstly, a descriptive analysis was conducted according to numbers and percentages for categorical variables. For quantitative variables mean and standard deviation (SD) were calculated if the variable could be explained as a normal distribution, or median and interquartile range (IR) were calculated if the variable did not follow a normal distribution.

Secondly, to evaluate the relationship between the most important psychological variables (depression, anxiety, stress and suicidal ideation) in cases and controls, we used the χ^2 -test and Fisher's exact test for categorical variables. Where Pearson criteria were not met, we used the Fisher exact test. In the comparison between the patients and controls by gender, the Mann-Whitney U test was introduced because the variables did not follow a normal distribution. Analysis of the main questionnaire and the HADS, EQ5D and DLQI questionnaires included stratification by gender.

In order to assess the relationship of different independent variables with depression and stress, multivariate logistic regression models adjusted by age were implemented. The ORs were calculated from the estimated regression coefficients B of the logistic regressions; the exponential of the coefficient gives the OR.

The statistical analysis was conducted with SPSS software (IBM SPSS Statistics for Windows, Version 19.0) and the p-value threshold was considered to be 0.05 in order to accept or reject the null hypothesis.

RESULTS

Of the 3,635 dermatology patients who completed the original study (9), 143 (3.9%) were hand eczema patients. There were 86 (60%) women (mean age 45.5 years, SD = 14.7, range 21-74) and 57 men (mean age 49.0 years, SD = 14.7, range 19-76) with hand eczema. The control population consisted of 900 women (mean age 40.0 years, SD = 13.3, range 18-85) and 453 men (mean age 40.0 years, SD = 14.2, range 18-89).

The 143 patients with hand eczema were recruited from 13 countries. Turkey and Norway had the biggest sample with 24 and 20 cases each. On the other hand, Spain, Belgium, France and Hungary had the smallest sample with 0, 2, 5, and 5 cases each. These individual country numbers were too small to allow any meaningful comparisons by country.

Table 1 gives details of age, marital status, socioeconomic status, hand eczema severity, stress, suicidal ideation, itching, depression and anxiety.

The severity of the disease was determined by the dermatologist. As the subtype of hand eczema was not recorded in this study, it was not possible to analyse the data based on subtypes. ~~In Table 1, data concerning the subjects who were widowed or divorced were excluded in order to create a 2x2 contingency table with dichotomous data, to apply the Fisher test.~~ The frequencies in the different groups are very similar, demonstrating lack of difference between the groups.

The mean age for all 143 patients was 45.2 years (SD 15.2). 60.6% were married and 72.9% were described as at a medium socioeconomic level. The mean duration of disease was 7.7 years (SD=11.9), and the dermatological diagnosis was known by 56.8% of patients. Severity was mild for 51.6%, moderate for 37.5%, and severe for 10.9%. Hand eczema patients rated 15.9% in depression and/or anxiety, itching was present in 81.2% of the cases and suicidal ideation in 14.2%.

Include Table 1

The results of the HADS, EQ5D and DLQI, compared with controls, are given by gender in Table 2. There were statistically significant differences between women patients and women controls for anxiety and depression (measured by HADS) and in all subscales measured by the EQ5D. Men patients versus men controls showed statistically significant differences in most EQ5D subscales except for anxiety and depression. In men, the differences were insignificant for anxiety and depression in both the HADS and in the EQ5D anxiety/depression subscales.

The median total DLQI score for all patients with hand eczema was 7. A DLQI score of 7 means that a skin disease is having a moderate effect on the patient's life (27). However this is a median score for a population and so individual patients in the cohort had a range of scores. There was no significant difference in the total DLQI scores or in the DLQI sub-domains between men and women (Table 2). ~~There were strong correlations ($p < 0.01$) between the total DLQI scores and the severity of the skin disease, and also with cardiac comorbidity (Table S1).~~ The most prevalent comorbidity was cardiovascular (15.3%): the prevalence of each of the other comorbidities was <6%.

Include Table 2

The regression analysis adjusted for age in Table 3 shows that patients with higher suicidal ideation, $p = 0.038$ and adjusted OR= 3.2 (1.06-9.79); higher widowed/divorced status, $p < 0.001$ and OR= 2.69 (1.56-4.64); and lower socioeconomic status, $p < 0.001$ and OR= 6.9 (2.45-19.24) had a greater chance than persons without suicidal ideation, lower widowed/divorced status and higher socioeconomic status to fulfil the HADS criterion (adjusted for the age). ~~In summary, patients with high suicidal ideation, low socioeconomic status and widowed or divorced were more likely to experience anxiety and depression (OR>1, $p<0,05$); whereas, widowed or divorced or low socioeconomic patients were more likely to experience stress (OR>1, $p<0,01$).~~ In summary, patients with high suicidal ideation, low socioeconomic status and who were widowed or divorced were more likely to fulfil the HADS criteria for anxiety [(Odds ratio (OR)>1, $p=0.038$, $p<0.001$ and $p<0.001$ respectively)]; low socioeconomic status ($p=0.007$) and widowed or divorced patients ($p=0.001$) were more likely to fulfil the HADS criteria for depression. For patients with severe and moderate hand eczema, only the widowed-divorced variable was statistically significant ($p = 0.041$ and OR= 0.29 (0.08-0.95)).

Include Table 3

DISCUSSION

Considerable differences were found between hand eczema patients and the control group. Patients report significantly higher levels of stress, suicidal ideation, depression, and anxiety. In addition, significant gender differences were also found, e.g. suicidal ideation was considerably higher for the patients than the controls ($p = 0.019$), though this difference was only statistically significant for women ($p = 0.007$). Women also reported significantly higher levels of anxiety ($p = 0.006$) and depression ($p < 0.001$) than men. With the EQ-5D subscales, there were also significant gender differences, with the exception of the anxiety/depression subscale for men. When we analysed gender differences between patients (not shown in Table 2), the only significant result was for the EQ5D anxiety/depression subscale ($p < 0.001$). These findings and the associated gender bias are in agreement with the results of previous studies (11, 32, 33, 34). Although this gender difference has been found in previous studies, we feel that it has not been sufficiently discussed in the literature. It can be argued that the design of the QoL questionnaires only partially allows the revealing of gender differences in behavioural and exposure patterns and the higher degree of emotional distress and discomfort reported by women (35, 36). QoL questionnaires are usually specifically designed to be of equal relevance to men and women and so their design may be counterproductive to assessing these more subtle differences.

Table 2 gives the results of the DLQI (only completed by patients). There were consistent gender differences in all subscales but none were statistically significant. This might be due to the relatively small number of patients in the sample. Moreover, there is doubt as to whether the DLQI subscales adequately consider a number of factors that may contribute to consistent gender differences, such as the fact that women tend to make more frequent use of perfumes, moisturisers and cosmetics (for aesthetic or occupational reasons) and often have more contact with cleansing products, rubber

gloves, liquids and other allergens linked to domestic tasks and child care (22, 35). The uneven gender distribution of hand eczema and its psychosocial consequences represents a public health challenge in terms of aetiology, prevention, and treatment (37).

The Spearman correlations for the HADS, EQ5D and DLQI and the sociodemographic variables and other conditions (stress, suicidal ideation, severity and cardiac comorbidity) show that rates of high anxiety (measured by the HADS) correlate positively with marital status and suicidal ideations, and negatively with socioeconomic status. The correlations between diagnostic severity and the DLQI subscales (symptoms, daily activities, leisure and treatment) are also noteworthy. It has been argued (34) that higher levels of mental distress may lead to treatment discontinuation or non-compliance and can also influence recovery and duration. All the results in this section are in line with findings from other studies (11, 22, 31, 32, 34, 38, 39). Taken together, these studies give a broad assessment of the psychosocial burden generated by hand eczema.

The hands play an essential role in the human socialisation processes - at work, in leisure activities, in the self-image of the individual or in the gestures that accompany communication processes. Most human actions depend on the hands and their appearance has a fundamental influence on a person's social life, far beyond a merely cosmetic value. Hand eczema, as a chronic inflammatory dermatosis with a relapsing course and poor prognosis (31, 34), is often provoked, maintained or aggravated as a consequence of non-apparent factors which are related to ongoing psychosocial processes (7, 8, 12, 22, 40). Progressively exploring, understanding, and explaining the global nature of the psychosocial burden is necessary for improved, holistic treatment.

There are several limitations to this study. The main limitation is the small size of the sample population of hand eczema patients. Also, the use of questionnaires does not allow the face-to-face interaction of a clinical interview, where it is easier to detect possible mental health disorders. This is one of the drawbacks of quantitative research, which could be overcome with the use of qualitative research. However, we consider the use of questionnaires useful for gathering information. We could consider a post-hoc analysis in order to clarify the role of the age in this kind of patients, seeing that confounder variables such as socioeconomic status or marital status can be related to age.

Other limitations include the recruitment procedures for patients and controls and the clinicians' impression of relatively mild objective sign-based severity of hand eczema in the sample population. In contrast, the DLQI median score of 7, interpreted as moderate impact on quality of life, is an example of quality of life impact not necessarily being directly related to the objective severity of skin disease.

This study has explored the substantial psychological burden caused by hand eczema, the gender differences involved in its impact and the difficulties that the condition can cause at work and at home. Depression, anxiety, stress, suicidal ideation and diagnostic severity were significantly correlated, between themselves, and with other confounders. The gender issue represents a serious problem that merits further, more extensive research.

CONFLICT OF INTERESTS

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The rest of the authors declare no conflicts of interest.

References

1. Hay RJ, Johns NE, Williams HC, et al. The global burden of skin disease in 2010: an analysis of the prevalence and impact of skin conditions. *J Invest Dermatol* 2014; 134: 1527-1534.
2. Rea JN, Newhouse ML, Halil T. Skin disease in Lambeth. A community study of prevalence and use of medical care. *Br J Prev Soc Med* 1976; 30: 107–114.
3. Dalgard F, Svensson A, Holm JØ, Sundby J. Self-reported skin morbidity in Oslo. Associations with sociodemographic factors among adults in a cross-sectional study. *Br J Dermatol* 2004; 151: 452-457.
4. Dalgard F, Gieler U, Holm JØ, et al. Self-esteem and body satisfaction among late adolescents with acne: results from a population survey. *J Am Acad Dermatol* 2008; 59: 746-751.
5. Hughes JE, Barraclough BM, Hamblin LG, White JE. Psychiatric symptoms in dermatology patients. *Br J Psychiatry* 1983;143: 51–54.
6. Picardi A, Abeni D, Melchi CF, et al. Psychiatric morbidity in dermatological outpatients: an issue to be recognized. *Br J Dermatol* 2000; 143: 983-991.
7. Gieler U. Atopic Dermatitis – Psychosomatic and Psychobiological Aspects. In: Handbook of Atopic Eczema, 2nd edition, Ring J, Przybilla T, Ruzicka T (eds). New York: Springer Verlag Heidelberg; 2005: 544-556.
8. Gieler U. Psychodermatology. In: European Dermatology Forum, 2nd edition, Fritsch P, Burgdorf W (eds). Berlin: ABW Wissenschaftsverlag; 2007: 43-45.
9. Dalgard FJ, Gieler U, Tomas-Aragones L, et al. The Psychological Burden of Skin Diseases: A Cross-Sectional Multicenter Study among Dermatological Out-Patients in 13 European Countries. *J Invest Dermatol* 2015; 135: 984-991.
10. Szepietowski J, Salomon J. Hand dermatitis: a problem commonly affecting nurses. *Rocz Akad Med Bialymst* 2005; 50: 46-48.
11. Cvetkovski RS, Zachariae R, Jensen H, et al. Quality of life and depression in a population of occupational hand eczema patients. *Contact Dermatitis* 2006; 54: 106-111.
12. Mollerup A, Johansen JD, Thing LF. Knowledge, attitudes and behaviour in everyday life with chronic hand eczema: a qualitative study. *B J Dermatol* 2013; 169: 1056-1065.

13. Mortz CG, Bindslev-Jensen C, Andersen KE. Hand eczema in The Odense Adolescence Cohort Study on Atopic Diseases and Dermatitis (TOACS): prevalence, incidence and risk factors from adolescence to adulthood. *Br J Dermatol* 2014; 171: 313-323.
14. Ahmed A, Shah R, Papadopoulos L, Bewley, A. An ethnographic study into the psychological impact and adaptive mechanisms of living with hand eczema. *Clin Exp Dermatol* 2015; 40: 495-501.
15. Cazzaniga S, Ballmer-Weber BK, Gräni N, et al. Medical, psychological and socio-economic implications of chronic hand eczema: a cross-sectional study. *J Eur Acad Dermatol Venereol* 2016; 30: 628-637.
16. Corti MA, Stirnimann R, Borradori L, Simon D. Effects of Systematic Patient Education in Skin Care and Protection in a Hand Eczema Clinic. *Dermatology* 2014; 228: 220-224.
17. Diepgen, TL, Agner T, Aberer W, et al. Management of chronic hand eczema. *Contact dermatitis* 2007; 57: 203-210.
18. Grönhagen CM, Lidén C, Bergström A, et al. Prevalence and incidence of hand eczema in adolescence: report from BAMSE—a population-based birth cohort. *Br J Dermatol* 2014; 171: 609-614.
19. Grönhagen C, Lidén C, Wahlgren CF, et al. Hand eczema and atopic dermatitis in adolescents: a prospective cohort study from the BAMSE project. *Br J Dermatol* 2015; 173: 1175-1182.
20. Ibler KS, Jemec GB, Diepgen TL, et al. Skin care education and individual counselling versus treatment as usual in healthcare workers with hand eczema: randomised clinical trial. *BMJ* 2012; 345:e7822.
21. Freeman EE. A seat at the big table: expanding the role of dermatology at the world health organization and beyond. *J Invest Dermatol* 2014; 134: 2663–2665.
22. Anveden Berglind I, Alderling M, Meding B. Life-style factors and hand eczema. *Br J of Dermatol* 2011; 165: 568-575.
23. Zigmond AS, Snaith RP. The hospital anxiety and depression scale. *Acta Psychiatr Scand* 1983; 67: 361–370.
24. Mykletun A, Stordal E, Dahl AA. Hospital Anxiety and Depression (HAD) scale: factor structure, item analyses and internal consistency in a large population. *Br J Psychiatry* 2001; 179: 540–544.
25. Bjelland I, Dahl AA, Haug TT, Neckelmann D. The validity of the hospital anxiety and depression scale. An updated literature review. *J Psychosom Res* 2002; 52: 69–77.
26. Finlay AY, Khan GK. Dermatology Life Quality Index (DLQI): a simple practical measure for routine clinical use. *Clin Exp Dermatol* 1994; 19: 210-216.

27. Hongbo Y, Thomas CL, Harrison MA, et al. Translating the science of quality of life into practice: What do dermatology life quality index scores mean? *J Invest Dermatol* 2005; 125: 659-664.
28. Greiner W, Weijnen T, Nieuwenhuizen M, et al. A single European currency for EQ-5D health states. *Eur J Health Econ* 2003; 4: 222-231.
29. Hinz A, Brahler E. Normative values for the hospital anxiety and depression scale (HADS) in the general German population. *J Psychosom Res* 2011; 71: 74-78.
30. Breeman S, Cotton S, Fielding S, Jones GT. Normative data for the hospital anxiety and depression scale. *Qual Life Res* 2015; 24: 391-398.
31. Lindberg M, Bingefors K, Meding B, Berg M. Hand eczema and health-related quality of life; a comparison of EQ-5D and the Dermatology Life Quality Index (DLQI) in relation to the hand eczema extent score (HEES). *Contact dermatitis* 2013; 69: 138-143.
32. Boehm D, Schmid-Ott G, Finkeldey F, et al. Anxiety, depression and impaired health-related quality of life in patients with occupational hand eczema. *Contact Dermatitis* 2012; 67: 184-192.
33. Böhm D, Gissendanner SS, Finkeldey F, et al. Severe occupational hand eczema, job stress and cumulative sickness absence. *Occup Med (Lond)* 2014; 64: 509-515.
34. Kouris A, Armyra K, Christodoulou C, et al. Quality of life, anxiety, depression and obsessive-compulsive tendencies in patients with chronic hand eczema. *Contact dermatitis* 2015; 72: 367-370.
35. Noiesen E, Munk MD, Larsen K, et al. Gender Differences in Topical Treatment of Allergic Contact Dermatitis. *Acta Derm Venereol* 2009; 89: 79-110
36. Holm EA, Esmann J, Jemec GB. Does visible atopic dermatitis affect quality of life more in women than in men? *Gen Med* 2004; 1: 125-130.
37. Meding, B. Hand eczema—a chronic condition with far-reaching consequences. *Br J Dermatol* 2014; 171: 1292-1293.
38. Niemeier V, Nippesen M, Kupfer J, et al. Psychological factors associated with hand dermatoses: which subgroup needs additional psychological care? *Br J Dermatol* 2002; 146: 1031-1037.
39. Halvorsen JA, Lien L, Dalgard F, et al. Suicidal ideation, mental health problems, and social function in adolescents with eczema: a population-based study. *J Invest Dermatol* 2014; 134: 1847-1854.
40. Marron SE, Tomas-Aragones L, Boira S, Campos-Rodenas R. Quality of Life, Emotional Wellbeing and Family Repercussions in Dermatological Patients Experiencing Chronic Itching: A Pilot Study. *Acta Derm Venereol* 2016; 96: 331-335.

Table 1 – Results from the questionnaires of main population. Characteristics of hand eczema patients (143) and global controls (1,359).

	Patients results, n=143. N (%)	Patients Women, n=86. N (%)	Controls Women, n=900. N (%)	P-value patients vs. controls (women)	Patients Men, n=57. N (%)	Controls Men, n=453. N (%)	P-value Patients vs. controls (men)	P-value Patients Men vs. Women. Complete sample
Age (years)	45.2 (DE=15.2)	45.50 (IR=22)	40 (IR=21)	NS*	49 (IR=24)	40 (IR=21)	0.004*	NS*
Marital status				NS***			NS***	NS***
Single	33 (25.0%)	21 (25.3%)	221 (24.6%)		12 (24.5%)	141 (31.1%)		
Married	80 (60.6%)	49 (59.0%)	558 (62.0%)		31 (63.3%)	281 (62.0%)		
Divorced	13 (9.8%)	8 (9.6%)	91 (10.1%)		5 (10.2%)	27 (6.0%)		
Widowed	6 (4.5%)	5 (6.0%)	30 (3.3%)		1 (2.0%)	4 (0.9%)		
¹Socioeconomic				NS**			NS***	NS***
Low	26 (18.5%)	18 (21.4%)	146 (16.3%)		8 (14.3%)	69 (15.3%)		
Middle	102 (72.9%)	56 (66.7%)	680 (75.9%)		46 (82.1%)	330 (73.3%)		
High	12 (8.5%)	10 (11.9%)	70 (7.8%)		2 (3.6%)	51 (11.3%)		
²Severity of hand eczema								NS**
Mild	48 (51.6%)	35 (46.1)	—	—	31 (59.6)	—	—	
Moderate	48 (37.5%)	33 (43.4)	—	—	15 (28.8)	—	—	
Severe	14 (10.9%)	8 (10.5)	—	—	6 (11.5)	—	—	
³Stress	58 (41.4%)	34 (40.5%)	275 (30.7%)	0.044**	24 (42.9%)	137 (30.5%)	0.045**	NS**
⁴Suicide	20 (14.2%)	14 (16.5%)	50 (7.3%)	0.007**	6 (10.7%)	38 (10.0%)	NS**	NS**
⁵Itch	112 (81.2%)	69 (82.1%)	55 (7.8%)	<0.001**	43 (79.6%)	33 (8.5%)	<0.001**	NS**
⁶Depression	21 (15.9%)	16 (20.3%)	—	—	5 (9.4%)	—	-	NS**
⁷Anxiety	21 (15.9%)	18 (22.8%)	—	—	3 (5.7%)	—	-	0.009**

* Mann-Whitney U test

** χ^2 -test

*** Fisher exact test, excluding Divorced and Widowed

Abbreviations: IR - interquartile range; N - population number; NS - non-significant.

Self-reported variables (except hand eczema severity) from questionnaire:

¹“Which is your socioeconomic level?” Low/Middle/High

²Hand eczema severity was assessed and graded by the dermatologist.

³“Have you had any stressful life events during the last six months?” Yes/No

⁴“Have you ever thought of committing suicide?” Yes/No

⁵“Do you itch now?” Yes/No

⁶Answers recorded by dermatologists responding to question “Do you see depressive signs in the patient? Yes/No”

⁷Answers recorded by dermatologists responding to question “Do you see anxiety signs in the patient? Yes/No”

Table 2 - Results of the HADS, EQ5D and DLQI questionnaires (gender differences between patients and the control group, separate and aggregated)

	Women Patients, n=86. Median (IR)	Women Controls, n=900. Median (IR)	P-value* Patients vs controls (female)	Men Patients, n=57. Median (IR)	Men Controls, n=453. Median (IR)	P-value* Patients vs controls (male)	P-value* Patients vs Controls. Complete sample
**HADS							
Anxiety	7.00 (6.00)	5.00 (5.00)	0.017	5.00 (7.50)	5.00 (4.00)	NS	0.026
Depression	4.00 (8.00)	3.00 (5.00)	<0.001	3.00 (8.00)	3.00 (5.00)	NS	<0.001
EQ5D							
Mobility	1.00 (1.00)	1.00 (0.00)	<0.001	1.00 (1.00)	1.00 (0.00)	<0.001	<0.001
Self-Care	1.00 (0.00)	1.00 (0.00)	<0.001	1.00 (0.00)	1.00 (0.00)	<0.001	<0.001
Usual Activities	1.00 (1.00)	1.00 (0.00)	<0.001	1.00 (1.00)	1.00 (0.00)	<0.001	<0.001
Pain/Discomfort	2.00 (1.00)	1.00 (1.00)	<0.001	2.00 (1.00)	1.00 (1.00)	<0.001	<0.001
Anxiety/Depression	2.00 (1.00)	1.00 (1.00)	<0.001	1.00 (1.00)	1.00 (1.00)	NS	<0.001
Health Status (own health)	70.00 (34.00)	85.00 (20.0)	<0.001	72.50 (29.00)	85.00 (15.00)	<0.001	<0.001
DLQI Total	7.00 (9)	—	—	6.50 (8.75)	—		NS
Symptoms and feelings	3.00 (2.75)	—	—	2.00 (3.00)	—		NS
Daily Activities	1.00 (3.00)	—	—	1.00 (2.75)	—		NS
Leisure	1.00 (6.00)	—	—	1.00 (6.00)	—		NS
Work and School	1.00 (2.00)	—	—	1.00 (2.00)	—		NS
Personal relationships	0.00 (1.50)	—	—	0.00 (2.00)	—		NS
Treatment	0.00 (1.00)	—	—	0.00 (1.00)	—		NS

* Mann-Whitney U test

**HADS score for both the dimension of Anxiety and Depression are as follows: 0 to 7 is considered a normal case, from 8 to 10 a borderline case, and from 11 to 21 a case in need of further examination or treatment.

Abbreviations: IR - interquartile range; NS - non-significant.

Table 3 - Depression (HADS \geq 11) and stress in hand eczema patients (n=143): relationships with confounders and risk values (OR).

	Depression HADS\geq11		STRESS	
	P-valueΔ	OR*, (CI 95%)	P-valueΔ	OR*, (CI 95%)
Suicidal ideation/no suicidal ideation	0.038	3.23 (1.06-9.79)	0.074	2.41 (0.92-6.35)
Cardio comorbidity/no cardio comorbidity	0.113	2.564 (0.79-8.22)	0.806	1.13 (0.42-3.08)
Widowed-Divorced/rest of the status (single or married)	<0.001	2.69 (1.56-4.64)	0.01	3.90 (1.38-11.05)
Low socioeconomic status/rest of the status (middle or high)	<0.001	6.87 (2.45-19.24)	0.007	3.45 (1.41-8.44)
Women/men	0.482	1.42 (0.53-3.78)	0.779	0.91 (0.46-1.80)
Foreign/native	0.564	1.62 (0.31-8.42)	0.357	0.46 (0.09-2.38)

*Adjusted OR adjusted by age

Δ : p-value of null hypothesis OR=1

Abbreviations: CI: Confidence interval; OR: Odds ratio