

ORIGINAL ARTICLE

The psychosocial burden of hand eczema: Data from a European dermatological multicentre study

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Background: The essential physical role, visibility and social importance of the hands place 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 prevalences of depression, anxiety, suicidal ideation, and comorbidities.

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

Results: Female patients with hand eczema had higher Hospital Anxiety and Depression Scale (HADS) scores for anxiety ($n = 86$, median = 7.0) than controls ($n = 900$, median = 5.0, $p = 0.02$), and for depression (median = 4.0) than controls (3.0, $p < 0.001$). Patients with high

suicidal ideation, with 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 Dermatology Life Quality Index 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. Physicians in particular should be aware of the need to identify anxiety and depression in female patients.

KEYWORDS

anxiety, depression, hand eczema, outpatients, psychosocial burden, quality of life, sex differences, stress

1 | INTRODUCTION

Skin conditions and skin-related diseases are among the most common human illnesses, implying both a high prevalence and a wide range of detrimental physical and psychological effects. The global impact of skin conditions collectively represents the fourth largest cause of non-fatal disease, as measured in years lost because of disability.¹ In the literature, the high prevalence of skin conditions is well recognized,^{2–4} as is the strong association between psychiatric disorders and skin disease.^{5–8} The full extent of psychological comorbidity resulting from skin disease across Europe was shown in a large European multicentre study.⁹ This 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 subsequent social and economic effects.^{10–15} Moreover, adults with hand eczema are 3 times more likely than non-sufferers to experience employment instability, sickness absence, disability, need for rehabilitation, and early retirement. Career disruption, lower income and financial losses resulting from the extra expenses incurred by having hand eczema have also been reported. The condition clearly has negative repercussions on quality of life (QoL) and social interaction.^{14–16}

The incidence of hand eczema in children, adolescents, women of reproductive age and the elderly is greater than in adult men. The 1-year prevalence of hand eczema has been estimated to be as high as 10% of the total population.^{13,17–19} Hand eczema often becomes chronic in terms of persisting for >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 on 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. Generally, 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 association of several psychosocial variables with the burden placed by hand eczema on patients. Different population characteristics of patients with hand eczema were compared with those of healthy controls. In addition, depression, anxiety, general QoL and dermatology-specific QoL were measured in comparison with controls, and confounding factors, including sex, were considered.

2 | METHODS

2.1 | Study design

This work is based on data from a European multicentre 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 1 or more random days until a study population of 250 was achieved. Inclusion criteria were: being at least 18 years of age; able to read and write the local language; and not suffering from 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 >1 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 obtained from the patient 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 in the same department. The control groups recruited at each participating centre included hospital staff, comprising both healthcare 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 reference.⁹

2.2 | Questionnaires

The initial questionnaire dealt with the following sociodemographic variables: age; sex (male, female); marital status (single, married/cohabiting, separated/divorced, widowed); socioeconomic status (low, middle, high), and education (primary education, secondary education, higher education, university). Stress was assessed with the question: "Have you experienced any stressful life events during the last 6 months?" Suicidal ideation was assessed with the question: "Have you ever thought of committing suicide?" Subjects were also asked whether or not they were experiencing any itching.

Symptoms of depression and anxiety (the main outcome variables) were assessed with the Hospital Anxiety and Depression Scale (HADS), which is a well-validated instrument with good psychometric properties regarding the presence and severity of anxiety disorders and depression.^{23–25} The HADS includes 7 items concerning anxiety and 7 concerning depression, each with 4 possible responses. For anxiety and depression, a score from 0 to 7 is considered to be normal, a score from 8 to 10 is considered to be borderline, and a score from 11 to 21 indicates that further examination or treatment is required. 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 randomized controlled dermatology studies. It is validated for adult dermatology patients aged ≥ 16 years. 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 following 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); and 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, and 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 1 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° scale (0 = "worst imaginable health state"; 100 = "best imaginable health state").

2.3 | Statistical analysis

In the multicentre 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 from dermatological conditions.^{29,30}

First, a descriptive analysis was conducted according to numbers and percentages for categorical variables. For quantitative variables, mean and SD were calculated if the variable followed a normal distribution, and median and interquartile range otherwise.

Second, 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; when Pearson criteria were not met, Fisher's exact test was used. For comparison of patients and controls concerning sex, the Mann-Whitney *U* test was utilized, because the variables did not follow a normal distribution. Analysis of the main questionnaire and the HADS, EQ-5D and DLQI questionnaires included stratification by sex.

In order to assess the relationships of different independent variables with depression and stress, multivariate logistic regression models adjusted by age were implemented. The odds ratios (ORs) were calculated from the estimated regression coefficients.

The statistical analysis was conducted with SPSS software (IBM SPSS Statistics for Windows, Version 19.0), and the *p*-value threshold concerning significance was chosen to be 0.05.

3 | RESULTS

Of the 3635 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, standard deviation (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 largest samples, with 24 and 20 cases, respectively. Conversely, Spain, Belgium, France and Hungary had the smallest samples, with 0, 2, 5 and 5 cases, respectively. The numbers per country were thus 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 on the basis of subtypes. The frequencies in the different groups were very similar.

The mean age for all 143 patients was 45.2 years (SD 15.2). Of these, 60.6% were married, and 72.9% were at a medium socioeconomic level. The mean duration of disease was 7.7 years (SD 1.9), 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

TABLE 1 Results from the questionnaires for the main population

	Patient results, N = 143, n (%)	Female patients, N = 86, n (%)	Female controls, N = 900, n (%)	p-Value, patients vs controls (women)	Male patients, N = 57, n (%)	Male controls, N = 453, n (%)	p-Value, patients vs controls (men)	p-Value, male patients vs female patients, complete sample
Age / years	45.2 (DE = 15.2)	45.50 (IQR = 22)	40 (IQR = 21)	NS ^a	49 (IQR = 24)	40 (IQR = 21)	0.004 ^a	NS ^a
Marital status				NS ^b			NS ^b	NS ^b
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)		
Socioeconomic status ^c				NS ^d			NS ^b	NS ^b
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)		
Severity of hand eczema ^f								NS ^d
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)	—	14 (10.9)	
Stress ^g	58 (41.4)	34 (40.5)	275 (30.7)	0.044 ^d	24 (42.9)	137 (30.5)	0.045 ^d	NS ^d
Suicide ^h	20 (14.2)	14 (16.5)	50 (7.3)	0.007 ^d	6 (10.7)	38 (10.0)	NS ^d	NS ^d
Itch ^f	112 (81.2)	69 (82.1)	55 (7.8)	<.001 ^d	43 (79.6)	33 (8.5)	<0.001 ^d	NS ^d
Depression ⁱ	21 (15.9)	16 (20.3)	—	—	5 (9.4)	—	—	NS ^d
Anxiety ^j	21 (15.9)	18 (22.8)	—	—	3 (5.7)	—	—	0.009 ^d

SD, standard deviation; IQR, interquartile range; NS, non-significant. Characteristics of hand eczema patients (N = 143) and global controls (N = 1359). Self-reported variables (except hand eczema severity) from questionnaire:

^a Mann-Whitney U test.

^b Fisher exact test.

^c "Which is your socioeconomic level?" Low/Middle/High.

^d χ^2 -test.

^e Hand eczema severity was assessed and graded by the dermatologist.

^f "Do you itch now?" Yes/No.

^g "Have you had any stressful life events during the last six months?" Yes/No.

^h "Have you ever thought of committing suicide?" Yes/No.

ⁱ Answers recorded by dermatologists responding to the question "Do you see depressive signs in the patient?" Yes/No.

^j Answers recorded by dermatologists responding to the question "Do you see anxiety signs in the patient?" Yes/No.

anxiety, itching was present in 81.2% of the cases, and suicidal ideation was present in 14.2%.

The results of the HADS, EQ-5D and DLQI, as compared with controls, stratified by sex, are shown in Table 2. There were statistically significant differences between female patients and female controls for anxiety and depression (measured with the HADS) and in all subscales measured with the EQ-5D. Male patients vs male controls showed statistically significant differences in all EQ-5D subscales except for anxiety and depression. In men, the differences were insignificant for anxiety and depression in both the HADS and the EQ-5D 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 has a moderate effect on the patient's life.²⁷ However, as this is a median score, individual patients in the cohort had a broad range of scores. There was no significant difference in the total DLQI scores or in the DLQI

subdomains between men and women (Table 2). The most prevalent comorbidity was cardiovascular disease (15.3%); the prevalence of each of the other comorbidities was <6%.

The regression analysis adjusted for age in Table 3 shows that patients with higher suicidal ideation [$p = 0.038$ and adjusted OR = 3.2 (95%CI: 1.06-9.79)], higher widowed/divorced status [$p < 0.001$ and OR = 2.69 (95%CI: 1.56-4.64)] and lower socioeconomic status [$p < 0.001$ and OR = 6.9 (95%CI: 2.45-19.24)] had a greater chance than persons without suicidal ideation, lower widowed/divorced status and higher socioeconomic status of fulfilling the HADS criterion (adjusted for age). In summary, patients with high suicidal ideation, with low socioeconomic status and who were widowed or divorced were more likely to fulfil the HADS criteria for anxiety (OR > 1, $p = 0.038$, $p < 0.001$, and $p < 0.001$ respectively); and those with low socioeconomic status ($p = 0.007$) and widowed or divorced patients ($p = 0.001$) were more likely to fulfil the HADS criteria for

TABLE 2 Results of the Hospital Anxiety and Depression Scale (HADS), EQ-5D and Dermatology Life Quality Index (DLQI) questionnaires (sex differences between patients and the control group, separate and aggregated)

	Female patients, N = 86, median (IQR)	Female controls, N = 900, median (IQR)	p-Value ^a , patients vs controls (female)	Male patients, N = 57, median (IQR)	Male controls, N = 453, median (IQR)	p-Value ^a , patients vs controls (male)	p-Value ^a , patients vs controls, complete sample
HADS ^b							
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
EQ-5D							
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 (1.00)	1.00 (0.00)	<0.001	1.00 (1.00)	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

IQR, interquartile range; NS, non-significant.

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

depression. For patients with severe and moderate hand eczema, only the widowed/divorced variable was statistically significant [$p = 0.041$ and OR = 0.29 (95%CI: 0.08-0.95)].

4 | DISCUSSION

Considerable differences were found between hand eczema patients and the control group. Patients reported significantly higher levels of stress, suicidal ideation, depression, and anxiety. In addition, significant sex differences were found; for example, suicidal ideation was considerably higher for patients than for controls ($p = 0.019$), although 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. Regarding the EQ-5D subscales, there were also significant sex differences, with

the exception of the anxiety/depression subscale for men. When we analysed sex differences between patients (not shown in Table 2), the only significant result was for the EQ-5D anxiety/depression subscale ($p < 0.001$). These findings and the associated sex bias are in agreement with the results of previous studies.^{11,31–33} Although this sex 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 detection of sex differences in behavioural and exposure patterns and the higher degree of emotional distress and discomfort reported by women.^{34,35} QoL questionnaires are usually specifically designed to be of equal relevance to men and women, and so their design may be counterproductive for assessing these more subtle differences.

Table 2 gives the results of the DLQI (only completed by patients). There were consistent sex differences in all subscales, but

TABLE 3 Depression [Hospital Anxiety and Depression Scale (HADS) ≥ 11] and stress in hand eczema patients ($N = 143$): relationships with confounders and risk values [odds ratios (ORs)]

	Depression HADS ≥ 11		Stress	
	p-Value	OR ^a (95%CI)	p-Value	OR ^a (95%CI)
Suicidal ideation/no suicidal ideation	0.038	3.23 (1.06-9.79)	0.074	2.41 (0.92-6.35)
Cardiac comorbidity/no cardiac comorbidity	0.11	2.56 (0.79-8.22)	0.81	1.13 (0.42-3.08)
Widowed/divorced/other status (single or married)	<0.001	2.69 (1.56-4.64)	0.01	3.90 (1.38-11.1)
Low socioeconomic status/other socioeconomic status (middle or high)	<0.001	6.87 (2.45-19.2)	0.007	3.45 (1.41-8.44)
Women/men	0.48	1.42 (0.53-3.78)	0.78	0.91 (0.46-1.80)
Foreign/native	0.56	1.62 (0.31-8.42)	0.36	0.46 (0.09-2.38)

^a OR adjusted by age.

none were statistically significant. This might be attributable 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 sex differences, such as the fact that women tend to make more frequent use of perfumes, moisturizers 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.^{22,34} The uneven sex distribution of hand eczema and its psychosocial consequences represent a public health challenge in terms of aetiology, prevention, and treatment.³⁶

The Spearman correlations for the HADS, EQ-5D and DLQI and the sociodemographic variables and other conditions (stress, suicidal ideation, severity, and cardiac comorbidity) show that high anxiety (measured with the HADS) correlates 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 argued³³ that higher levels of mental distress may lead to treatment discontinuation or non-compliance, and can also influence recovery and duration. All the results reported in this section are in line with findings from other studies.^{11,22,31,33,37–39} 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 socialization processes—at work, in leisure activities, in the self-image of the individual, and in the gestures that accompany communication. 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,^{33,37} is often provoked, maintained or aggravated as a consequence of non-apparent factors 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 of 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 to be useful for gathering information. A *post hoc* analysis could be performed to clarify the role of age in these patients, acknowledging 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' assessment, which showed relatively mild severity of hand eczema in the sample population. However, the DLQI, with a median score of 7 observed, here interpreted as indicating a moderate impact on QoL, is an example of QoL impact that is not necessarily directly related to the objective severity of skin disease.

This study has explored the substantial psychological burden caused by hand eczema, the sex 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 sex issue represents a serious problem that merits further, more extensive research.

Conflict of interest

Andrew Y. Finlay is joint copyright owner of the DLQI, Cardiff University and receives royalties from the use of the DLQI. The remaining authors declare no potential conflict of interests.

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