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Predictors of perceived stress, perceived stigmatization, and body dysmorphia in patients with chronic prurigo/prurigo nodularis: Results from an observational cross-sectional multicenter European study in 17 countries



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Background: Anxiety, depression and suicidal ideation are frequent in patients with chronic prurigo (CPG).

Objective: To analyze perceived stress, stigmatization, body dysmorphia, anxiety, depression and itch-related quality of life in CPG patients and compare them to controls, and then to identify variables/predictors of them.

Methods: This study is part of a cross-sectional multicenter study in 17 European countries including 5487 consecutive patients and 2808 controls.

Results: One hundred twenty-seven individuals with prurigo were included in the analyses. They reported higher levels of stress, stigmatization, and body dysmorphia than controls. In the patient group, stigmatization was associated with higher stress and having a severe disease, stress with younger age and lower

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income, depression and anxiety with lower income and higher itch intensity, body dysmorphia with younger age, and dissatisfaction with appearance.

Limitations: CPG patients were older than controls and had significantly more comorbidities. However, multivariate analysis allowed controlling for these differences by including them as a covariate.

Conclusion: CPG patients have high levels of perceived stress, perceived stigmatization and body dysmorphic, which are partly related to sociodemographic factors like younger age or lower income as well as to other psychological and disease-related factors. (J Am Acad Dermatol 2025;92:1056-63.)

Key words: body dysmorphia; burden; itch; perceived stigmatization; prurigo; pruritus; stress.

INTRODUCTION

Chronic prurigo/prurigo nodularis (CPG) is a distinct disease with the presence of multiple pruriginous lesions, the presence of chronic pruritus, and the history and/or sign of a prolonged scratching behavior.¹ European authors prefer the term “chronic prurigo” because lesions can be nodules as well as papules, umbilicated lesions, plaques or linear lesions²⁻⁴ while US authors sometimes prefer the term “prurigo nodularis.”⁵ In this paper, we will use the term “CPG” to bridge both uses.

All authors agree on the suffering caused by CPG and its psychosocial repercussions.¹⁻⁵ In a first study, the European Society for Dermatology and Psychiatry (ESDaP) showed that anxiety, depression, and suicidal ideation were high among patients with

CAPSULE SUMMARY

- This study showed that besides anxiety and depression, also perceived stigmatization, perceived stress and body dysmorphia are more frequent in patients with prurigo compared to healthy skin controls.
- Higher levels of perceived stress, perceived stigmatization, and body dysmorphia are associated with more severe CPG and itch severities as well as other factors like younger age or lower income.

CPG and that the impact on quality of life (QoL) was severe,⁶ especially due to their chronic itch-scratch cycle and associated comorbidity burden.⁷ Not only the presence of severe pruritus and pruriginous lesions but also sleep disorders and other mental symptoms may contribute to a higher burden in patients with CPG when compared with patients with chronic pruritus on non-lesional skin.⁸ The daily life of patients with CPG is deeply affected by the disease, with

consequences on sleep, leisure and work. These consequences are higher if the general health status and QoL of patients are severely affected and if the level of stigmatization is high.⁹

In this study, the aim was to analyze different psychological comorbidities in CPG patients and to identify variables/predictors of them: perceived

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Abbreviations used:

5PLQ:	5- Pruritus Life Quality questionnaire
BDD:	body dysmorphic disorder
CPG:	chronic prurigo
DSQ:	Dysmorphic Concern Questionnaire
ESDaP:	European Society for Dermatology and Psychiatry
GAD:	General Anxiety Disorder Assessment
NRS:	numeric rating scale
PHQ:	Patient Health Questionnaire
PSQ:	Perceived Stigmatization Questionnaire
PSS-10:	Perceived Stress Scale

stress, stigmatization, body dysmorphic disorders (BDD), anxiety, depression, and QoL. Since previous publications on ESDaP study II reported global results for the overall group of dermatological patients,¹⁰⁻¹² the aim of this paper is to focus on CPG patients. It is intended to assess the specific profile of psychological comorbidities and possible predictors in this group of patients. One of the clinical goals is to identify patients at particular risk for psychological comorbidities.

MATERIAL AND METHODS

Study design

Data were gathered in an observational cross-sectional multicenter study (ESDaP-study II) in 17 European countries. The study protocol and studies regarding BDD and perceived stigmatization in common skin diseases have already been published.^{10,11,13} A total of adult 250 patients and 125 controls were recruited in 22 dermatological outpatient clinics. Each patient was clinically examined by a dermatologist who recorded the diagnosis and its severity. Comorbidities were also reported.

Ethics

The study protocol was approved by the Institutional Review Board of the Department of Medicine at the University of Giessen, Germany (Protocol Number 87/17) and ethics committee of all participating sites. The study was conducted in accordance with the Declaration of Helsinki and was registered at the German registry for clinical studies (DRKS00012745). All patients provided written informed consent before participation in the study.

Patient reported outcome measurements

Each participant filled in a general questionnaire with background information such as socio-demographic details and satisfaction with appearance. Patients answered additional questions about

the presence and intensity of itch, burning, tingling, and pain sensations in the last 24 hours.

The following questionnaires were completed both by patients and controls, evaluating different domains:

- *Assessment of perceived stress*

The *Perceived Scale Stress (PSS-10)*, a 10-item questionnaire, measures self-rated stress during the last month.¹⁴ Each item is scored on a 5-point scale. The total score is computed by adding all the item responses (score range from 0 to 40). Higher item scores indicate higher levels of perceived stress.

- *Assessment of perceived stigmatization*

The *Perceived Stigmatization Questionnaire (PSQ)* contains 21 items divided into 3 subscales, absence of friendly behavior, confusing/staring behavior and hostile behavior.¹⁵ Each item is scored on a 5-point Likert scale. Each subscale and the total score are computed by adding all the item responses and dividing by the total number of items (scores between 1 and 5). Higher item scores indicate greater perception of stigmatization behavior.

- *Assessment of BDD*

The *Dysmorphic Concern Questionnaire* is a screening tool for BDD.¹⁶ This questionnaire comprises 7 questions relating to appearance concerns. Each item is scored on a 4-point scale (from 0 to 3). The total score is computed by adding all the item responses (score range from 0 to 21). A cut-off value of 14 was used to classify persons with BDD (≥ 14).

- *Assessment of itch and itch-related QoL*

Itch severity was measured using the numerical rating scale, ranging from 0 (no itch) to 10 (worst imaginable itch). The cut-off values are 3-7-9 (ie, $>0 < 3$ points represents mild pruritus, $\geq 3-7$ points moderate pruritus, $\geq 7-9$ points severe pruritus, and ≥ 9 points very severe pruritus).¹⁷

The 5- Pruritus Life Quality questionnaire assesses aspects of QoL related to itch with 5 items: frequency of itch, extent of impairment in daily life, social life, impact on sleep and enjoyment of life and mood, resulting from itch during the last 7 days, with answer categories ranging from 0 to 4. Scores ranged from 0 to 20 with higher scores indicating a strong involvement of pruritus in QoL.

- *Assessment of health-related QoL*

Overall health status was assessed by self-report using the visual analogue scale, a part of the EQ-5D-3L ranging from 0 (worst state of health) to 100 (best imaginable state of health).¹⁸

• *Assessment of depression and anxiety*

The *Patient Health Questionnaire (PHQ-4)* was used, a questionnaire consisting of 2 different parts (PHQ-2 for depression; General Anxiety Disorder Assessment (GAD-2) for anxiety). The total PHQ-2 and GAD-2 sum scores range from 0 to 6,¹⁹ and the composite PHQ 4 total score ranges from 0 to 12.

Statistical analyses

We coded subjects as missing for each variable as soon as one item on a scale was missing. Descriptive statistics were presented as number and percentage for the qualitative variables, and mean and standard deviation for the quantitative variables.

Univariate analysis. Comparisons of patients with CPG to control persons were conducted. Student's t-tests or Mann–Whitney *U* tests were used for quantitative variables. χ^2 or Fisher tests were applied for qualitative variables.

Multivariate analysis. Linear or logistic regressions using the different scores as outcome were performed in multivariate analyses. The presence of sex, age, body mass index (kg/m²) and comorbidities (heart disease, chronic respiratory disease, diabetes, and rheumatological disease) were used as covariates.

Finally, we investigated in which CPG patients there was a risk of psychological abnormalities. Visual analog scale EQ-5D-3L (health status), perceived stigmatization (PSQ_score), perceived stress (PSS-10), depression (PHQ-2), anxiety (GAD-2), BDD (*Dysmorphic Concern Questionnaire*) and pruritus related QoL (5- Pruritus Life Quality questionnaire) were used as dependent variables in linear regression analyses. The following variables were used as predictors: age, sex, income, stress, satisfaction with appearance, itch intensity, comorbidities, visibility of flares and clinical disease severity.

According to Cohen, adjusted R² values between .13 and .25 indicated a moderate and R² values greater or equal to .26 a substantial goodness-of-fit for the regression model.^{12,20}

A *P*-value <.05 was considered statistically significant. Univariate analyses were performed using XLSTAT 2022.4.1 (Addinsoft, Paris, France). For multivariate analyses, Medistica., pvalue.io, a graphic user interface to the R statistical analysis software for scientific medical publications was used. It is available on: <https://www.pvalue.io>. SPSS software (IBM) was used for regression analyzes.

RESULTS

Characteristics of patients with CPG

There were 127 individuals with CPG including 75 women (59.1%) and 52 men (40.9%). The mean age

Table I. Socio-demographic characteristics and comorbidities of patients with CPG and controls

	Patients with CPG (n = 127)	Controls (n = 2808)	P value
Age (y)			
Range	19-84	18-91	
Mean ± SD	54.7 ± 15.0	43.1 ± 15.6	<.0001
N	127	2787	
Gender - % (N)			
Male	40.9 (52)	33.0 (924)	.063
Female	59.1 (75)	67.0 (1877)	
Marital status - % (N)			
Single	28.7 (35)	28.9 (797)	.956
Married/partner	71.3 (87)	71.1 (1959)	
Body mass index			
Mean ± SD	27.2 ± 5.6	24.6 ± 4.4	<.0001
N	122	2739	
Household income - % (N)			
Low	34.4 (43)	19 (527)	<.0001
Middle	54.4 (68)	64.6 (1790)	
High	11.2 (14)	16.4 (453)	
Stressfull life events during the last 6 mo - % (N)	47.2 (58)	35.9 (983)	<.05
Satisfaction with appearance (yes) - % (N)	57.2 (72)	74.1 (2039)	<.0001
Itch intensity			
Mean ± SD	5.4 ± 2.9	0.5 ± 1.4	<.0001
Comorbidities - % (N)			
Heart disease	28.0 (35)	8.7 (232)	<.0001
Chronical respiratory disease	14.5 (18)	4.4 (116)	<.0001
Diabetes	15.3 (19)	4.1 (108)	<.0001
Rheumatological disease	8.9 (11)	4.7 (125)	<.05
Comorbidities overall	60.0 (75)	27.6 (753)	<.0001

Bold values: *P* < .05.

N, Number of data.

was 54.7 years (SD = 15.0). Socio-demographic and comorbidities data of patients and controls are presented in [Table I](#). Patients were older than controls and had more comorbidities. They were more frequently unemployed and their household income was lower than in controls. The characteristics of the participants included in the whole ESDaP II study have been previously reported.¹⁰

The percentage of patients with CPG who were quite or very dissatisfied with their body appearance was higher (*P* < .0001) than in controls. Patients with CPG were on average 43.2 years old (SD = 19.3) when their skin disease started. Dermatologists estimated the current severity of the skin disease as

mild (24.6% of cases), moderate (54.8%), or severe (20.6%). CPG lesions were mostly present on arms and hands (66.9%), legs and feet (64.6%), and torso (55.1%). Visible lesions (face, scalp or hands) were found in 84.3% of the patients. As previously reported,¹² itching in the last 24 hours was mentioned by almost all patients. Burning (55.7%), stinging (41.6%) and pain (42.0%) sensations were also frequent.

Suicidal ideation because of this skin disease was reported by 31.7% of patients.

Psychological profile of patients with CPG

Health status. The visual analog EQ-5D-3L score was lower in patients than in controls, with a mean difference equal to -10.1 [-13.40; -6.50] ($P < .0001$) Tables II and III.

Depression and anxiety. The mean differences between patients and controls obtained in multivariate analysis for PHQ-2, GAD-2 and PHQ-4 scores were equal to 1.206 [0.958; 1.454] ($P < .0001$), 0.895 [0.680; 1.165] ($P < .001$), and 2.124 [1.655; 2.593] ($P < .0001$), respectively.

Stress. The PSS-10 score was higher in patients with CPG than in controls, with a mean difference equal to 2.81 [1.64; 3.99] ($P < .001$).

Stigmatization. The total score was higher in patients with CPG than in controls, with a mean difference equal to 0.122 [0.046; 0.198] ($P < .01$).

BDD. The DCQ score was higher in the CPG group than in the control group as recently reported.¹⁰ An odds ratio equal to 7.30 [3.57; 14.9] was determined ($P < .001$), if the analysis included the control variables.

Sociodemographic and disease-specific variables associated with the risk of psychological disorders/problems in patients with CPG

Overall the adjusted R^2 values for the regression models indicated a high goodness-of-fit for stress ($R^2 = .27$), BDD ($R^2 = .29$), current bad health ($R^2 = .36$) and pruritus specific QoL ($R^2 = .63$); and a moderate goodness-of-fit for stigmatization ($R^2 = .24$), depression ($R^2 = .17$), and anxiety ($R^2 = .15$), according to Cohen¹² (Table IV).

Patients with lower pruritus-specific QoL reported a higher itch intensity were more unsatisfied with their appearance, had more stressful life events, a higher level of clinical disease severity, and less comorbidities than patients with only a slightly reduced pruritus specific QoL (standardized regression coefficients $\beta = .43, -.40, .16, .16, -.14$).

CPG patients reported a better general health (Visual analog scale EQ5D-3L) if they were more

Table II. Psychological comorbidities in patients with CPG

	Patients with CPG (n = 127)	Controls (n = 2787)	P value
5- pruritus life quality questionnaire (5PLQ)			
Mean ± SD	11.2 ± 5.1	1.4 ± 2.4	<.0001
N	105	2165	
EQ-5D visual analog scale (EQ VAS)			
Mean ± SD	65.3 ± 20.9	79.9 ± 15.6	<.0001
N	123	2710	
Patient Health Questionnaire (PHQ-4)			
Depression (PHQ-2)			
Mean ± SD	2.3 ± 1.9	1.0 ± 1.3	<.0001
N	123	2693	
Anxiety (GAD-2)			
Mean ± SD	2.2 ± 1.8	1.2 ± 1.4	<.0001
N	126	2719	
Total score (PHQ-4)			
Mean ± SD	4.4 ± 3.4	2.2 ± 2.4	<.0001
N	123	2687	
Perceived Stress Scale questionnaire (PSS-10)			
Mean ± SD	16.9 ± 6.8	14.2 ± 6.3	<.0001
N	114	2664	
Perceived Stigmatization Questionnaire (PSQ)			
Total score			
Mean ± SD	1.8 ± 0.6	1.7 ± 0.4	.003
N	117	2619	
Dysmorphic Concern Questionnaire (DCQ)			
Mean ± SD	5.7 ± 4.9	3.8 ± 3.5	<.0001
N	125	2719	
0-13 (% (N))	90.4 (113)	97.9 (2663)	<.0001
14-21 (% (N))	9.6 (12)	2.1 (56)	

Bold values: $P < .05$.
N, Number of data.

satisfied with their appearance, had experienced fewer stressful situations in the last months, have had a lower itch intensity and were younger ($\beta = .31, -.28, -.23$ and $-.18$).

Patients with more signs of BDD were more unsatisfied with appearance and were younger than patients with fewer signs of BDD ($\beta = -.44, -.22$). Higher scores in the perceived stress scale were associated with more frequent stressful events in the last 6 months, lower income, and lower age ($\beta = .35, -.26, -.19$).

Table III. Psychological comorbidities in patients with CPG in comparison with controls, in multivariate analysis

	Mean difference or odds ratio [CI 95%]	P value
Pruritus related quality of life (5PLQ score)	9.769 [9.239; 10.299]	<.0001
Health status (VAS EQ-5D-3L score)	-10.10 [-13.40; -6.50]	<.0001
Depression and anxiety (PHQ-4)		
Patient Health Questionnaire-2 (PHQ-2)	1.206 [0.958; 1.454]	<.0001
Generalized Anxiety Disorder (GAD-2)	0.895 [0.680; 1.165]	<.001
Total score	2.124 [1.655; 2.593]	<.0001
Perceived Stress (PSS-10 score)	2.81 [1.64; 3.99]	<.001
Perceived Stigmatization (PSQ score)	0.122 [0.046; 0.198]	<.01
Body dysmorphia (DCQ score)	7.30 [3.57; 14.9]	<.001

Linear regressions were performed for 5-PLQ, VAS EQ-5D-3L, PHQ-4, PSS-10, and PSQ data. Logistic regression was performed for DCQ data (score < 13 or ≥14). Mean difference was calculated for 5-PLQ, VAS EQ-5D-3L, PHQ-4, PSS-10, and PSQ data. Odds ratio was calculated for DCQ data. Values were presented with their 95% confidence interval.

Bold values: $P < .05$.

CPG, Chronic prurigo; N, number of data.

Table IV. Linear regression analyses for psychological variables in patients with CPG (standardized regression coefficients (β))

	VAS EQ-5D-3L score (high values = good health)	PSQ score	PSS-10 score	PHQ-2 score	GAD-2 score	DCQ score	5PLQ score
Age	-.18	-.17	-.19	.01	-.09	-.22	.00
Sex (M/F)	.12	.06	-.05	.01	.08	.14	.04
Income (low/ middle/high)	.00	-.05	-.26	-.30	-.20	-.08	-.05
Stress (no/yes)	-.28	.18	.35	.13	.16	.14	.16
Satisfaction with appearance	.31	-.34	-.09	-.09	-.10	-.44	-.40
Itch intensity	-.23	.05	.14	.16	.23	.06	.43
Comorbidities (no/yes)	-.11	.09	-.06	.01	.06	.06	-.14
Visible flares	-.12	-.01	.01	.14	.08	-.06	.07
Clinical disease severity	.03	.21		.04	-.11	.10	.16
F	7.94	4.93	5.64	3.57	3.18	6.17	18.20
Corrected R ²	.36	.24	.27	.17	.15	.29	.63

F-value of the analysis of variance to check whether the regression model is significant overall and can therefore predict the independent variable.

5PLQ score, Pruritus related quality of life; CPG, chronic prurigo; DCQ score, Body dysmorphia; GAD-2 score, Generalized Anxiety Disorder; PHQ-2 score, Patient Health Questionnaire-2; PSQ score, Perceived Stigmatization; PSS-10 score, Perceived Stress; VAS EQ-5D-3L score, Health status.

Patients with higher feelings of stigmatization were more unsatisfied with appearance, had a more severe disease, and were more stressed than patients with lower feelings of stigmatization. Symptoms of depression and anxiety were associated with lower income and additional higher itch intensity for anxiety.

DISCUSSION

Previous analyses of the ESDaP II data showed that patients with CPG significantly more often have

clinically relevant BDD¹⁰ and feel more stigmatized more often than healthy controls.¹¹ This subgroup analysis of ESDaP II study data further demonstrates that patients with prurigo have significantly higher levels of perceived stress and report a lower health status than controls. They more frequently have anxiety, depression and suicidal ideation than healthy skin controls. We have identified predictors of perceived stress, perceived stigmatization, and BDD in patients with CPG: stigmatization was associated with higher stress and a more severe

disease, stress with younger age and lower income, depression and anxiety with lower income and higher itch intensity, BDD with younger age and dissatisfaction with appearance.

The ESDaP I study showed that 37% of patients with CPG suffered from anxiety, 29% from depression and 19% from suicidal ideations, and these frequencies were higher than in the 10 most common dermatological diseases.⁶ However, another tool (HADS) was used for the detection of anxiety and depression.

Itch contributes substantially to psychological disease burden in dermatological patients and is frequently associated with psychiatric comorbidities.^{12,21,22} The visibility of lesions was associated with a worse health status and depression/anxiety and higher severity of the skin disease was associated with BDD. To decrease the burden of CPG pruritus has to be treated with priority, although psychological burden might not improve simultaneously. New treatments are available or under development, allowing an alleviation of pruritus and visible lesions.²³⁻²⁵

Another study recently showed that the daily life of patients was severely modified with consequences on sleep, leisure, and work.⁹ QoL was more impaired when perceived stigmatization was higher. Stigmatization level measured by another tool (PUSH-D) was high.²⁶

By defining stigma,²⁷ Goffman recognized 3 forms of stigmatization: (1) the presence of external deformities; (2) deviations from “normal” personal traits; and (3) difference resulting from attitudes toward ethnic groups, nationalities or religions. According to our results, stigmatization is more related to the intensity of pruritus than to the occurrence of visible lesions. In patients with psoriasis, the frequency of scratching is also deeply associated with stigmatization experiences.²⁸ Hence, stigmatization experienced by CPG patients seems to be described best as “deviation from “normal” personal traits” since stigmatization seems to be mainly related to the scratching behavior rather than to the lesions by themselves.

BDD is a psychiatric disorder affecting about 2% of the general population²⁹ and is dramatically more prevalent in patients with dermatological conditions.¹⁰ Patients with CPG had relevant body dysmorphic concerns over 7 times more often than controls and these dysmorphic concerns were more related to pruritus than to disease severity and visibility of lesions. These surprising findings were also found in other cultural contexts.^{10,30} Patients with dermatological conditions perceive hostile and confused behavior by others as being due to their

signs and might therefore develop a higher symptom awareness during their lives.¹⁰ Our results evidenced strong positive associations between BDD and perceived stigmatization scores, confirming that there are close interactions.

While it is not surprising that stigmatization, stress, and BDD are associated with itch intensity and CPG severity, we also identified other predictors, such as younger age, dissatisfaction with appearance, or lower income as important contributing factors. This suggests that patients who are previously vulnerable for other reasons can have more psychological consequences than the others and that their vulnerability is enhanced by CPG, and especially itch.

Our study has some limitations. Patients with CPG were older than controls, and had significantly more comorbidities, but the multivariate analysis took into account and controlled for these differences. Dermatologists reported the severity of diseases as mild, moderate, or severe, but there was no more precise severity scale.

In conclusion, patients with CPG not only suffer from anxiety, depression, and suicidal ideation, but also stress, stigmatization, and BDD, which were more frequently reported with close interactions between them. We also identified factors of perceived stress, perceived stigmatization, and BDD such as CPG and itch severities or other factors like younger age or lower income.

Conflicts of interest

None disclosed.

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