ORIGINAL REPORT

Perceived Stigmatization among Dermatological Outpatients Compared with Controls: An Observational Multicentre Study in 17 European Countries

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Perceived stigmatization places a large psychosocial burden on patients with some skin conditions. Little is known about the experience of stigmatization across a wide range of skin diseases. This observational cross-sectional study aimed to quantify perceived stigmatization and identify its predictors among patients with a broad spectrum of skin diseases across 17 European countries. Self-report questionnaires assessing perceived stigmatization and its potential predictors were completed by 5,487 dermatology outpatients and 2,808 skin-healthy controls. Dermatological diagnosis, severity, and comorbidity were clinician-assessed. Patients experienced higher levels of perceived stigmatization than controls ($p < 0.001$, $d = 0.26$); patients with psoriasis, atopic dermatitis, alopecia, and bullous disorders were particularly affected. Multivariate regression analyses showed that perceived stigmatization was related to sociodemographic (lower age, male sex, being single), general health-related (higher body mass index, lower overall health), disease-related (higher clinician-assessed disease severity, presence of itch, longer disease duration), and psychological (greater distress, presence of suicidal ideation, greater body dysmorphic concerns, lower appearance satisfaction) variables. To conclude, perceived stigmatization is common in patients with skin diseases. Factors have been identified that will help clinicians and policymakers to target vulnerable patient groups, offer adequate patient management, and to ultimately develop evidence-based interventions.

SIGNIFICANCE

Perceived stigmatization is common in patients with psoriasis, and represents a substantial psychosocial burden. Little is known about stigmatization in other skin diseases. This study quantifies the stigmatization experience in a large range of skin diseases. Patients with psoriasis, atopic dermatitis, alopecia, and bullous disorders report the highest stigmatization levels. Psychological factors, including body dysmorphic concerns and distress, were the strongest predictors of stigmatization. New predictors indicate vulnerable patient groups, including younger male, single, overweight patients with longstanding disease, and itch. These insights will help clinicians and policymakers to develop targeted patient management strategies, including evidence-based interventions.

Key words: social stigma; skin diseases; medical psychology; multicentre study.

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The WHO has called governments worldwide into action to reduce stigmatization, which represents an additional burden for people with skin conditions (1). To guide such efforts, insight into the extent and predictors of perceived stigmatization is needed. Despite the high prevalence (up to 70–90% (2, 3)) and impact of perceived stigmatization in patients with psoriasis, knowledge of perceived stigmatization in other skin conditions is very limited (4, 5). A recent review on stigmatization in visible skin conditions showed that 61% of included studies were conducted in psoriasis, illustrating the vast need for research in other skin conditions to determine common and specific factors (5).

Stigma is classically defined as an attribute that is deeply discrediting (6, 7). Perceived stigmatization refers to an individuals' awareness of negative attitudes and/or practices related to a particular condition (8). These stigmatizing experiences may be overt behaviours (e.g. being asked to leave a public place), but can also be more subtle (e.g. staring, avoiding eye contact). Experiencing stigmatization is a known predictor of disability and quality of life (9–11). It not only impairs psychosocial functioning (e.g. associated with psychological distress, decreased self-esteem, and shame (5)), but is also a barrier to optimal healthcare considering its negative influence on health-seeking behaviour, treatment adherence and engagement in care (12).

Previous research has examined a narrow range of predictors of perceived stigmatization in smaller samples and specific diagnoses, such as psoriasis, without healthy control groups (5, 9). Regarding sociodemographic characteristics, lower age was related to higher perceived stigmatization in a few studies (2, 5, 13), while evidence for sex predicting perceived stigmatization is inconsistent (5). Concerning disease-related factors, greater disease severity and visibility are generally found to be related to perceived stigmatization, while factors such as disease duration, itch, and general health-related predictors have scarcely been examined (5). Furthermore, stigmatization is related to psychological outcomes, including depression, anxiety and suicidal ideation (5). The relationship between stigmatization and appearance-related psychological outcomes is largely unknown, though our prior publication showed a moderate relationship between perceived stigmatization and body dysmorphic concern (14). Furthermore, emerging insights highlight the importance of examining the co-occurrence of multiple stigmatized attributes within a person (e.g. being overweight and having a skin condition (15, 16)), which is known as intersectional stigma. Considering that obesity is associated with adverse outcomes in skin conditions (17), patients facing the double stigma of being obese and having a skin condition may represent a vulnerable subgroup for adverse outcomes, although this has not been examined.

Research in a broad range of dermatological conditions is desirable to gain insight on how stigmatization uniformly and distinctively affects individuals with different diagnoses. Furthermore, insight into determinants of stigmatization is necessary to identify vulnerable patient groups and target evidence-based interventions for patient management. This study therefore aims to estimate and compare levels of perceived stigmatization across different skin diseases compared with controls in a large sample in 17 European countries and provide an overview of sociodemographic, health-related, disease-related, and psychological predictors of perceived stigmatization.

MATERIALS AND METHODS

This section summarizes the study methods; further details are provided in previous publications (14, 18).

Study design, participants and procedure

In this observational cross-sectional multicentre study, a consecutive sample of dermatological outpatients and skin-healthy controls was recruited from 22 secondary or tertiary dermatological outpatient clinics in 17 European countries, between September 2017 and December 2019, until 250 patients and 125 controls per clinic were reached. Inclusion criteria were age >18 years and ability to read and write in the local language. Skin-healthy controls were recruited through advertising at included hospitals, and were excluded when under current dermatological treatment. The study was approved by the Institutional Review Board of the Department of Medicine at the University of Giessen (protocol number 87/17), and at each recruitment centre. The study was registered at the German registry for clinical studies (registration number: DRKS00012745), and conducted in concordance with the Declaration of Helsinki. Written informed consent was obtained from all participants.

Outcome measures

For an overview of study measures, see supplementary material of the study protocol (https://bmjopen.bmj.com/content/bmjopen/8/12/e024877/DC1/embed/inline-supplementary-material-1.pdf?download=true) (18).

Perceived stigmatization

Perceived stigmatization was assessed with the 21-item Perceived Stigmatisation Questionnaire (PSQ (19)), consisting of 3 subscales: "absence of friendly behaviour", "confused/staring behaviour", and "hostile behaviour". This questionnaire can be used across health conditions (20, 21) and in the general population (22). Items are answered on a 5-point Likert scale, with higher scores reflecting higher levels of perceived stigmatization. The PSQ was recommended for use based on its content validity and psychometric characteristics in a recent review (23).

Potential predictor variables

Sociodemographic and general health-related variables. These were assessed by self-report questionnaires, recording age, sex, educational level, and marital status. Body mass index (BMI) was calculated using patients' self-reported height and weight. Current health state was assessed by the EuroQol 5-D (EQ5D) visual analogue scale (VAS) (24). The presence of physical comorbidity was recorded by a dermatologist (see below) and by self-report.

Disease-related variables. All patients were examined clinically and received a dermatological diagnosis from the International

Classification of Diseases 10th Revision (ICD-10) classification by a dermatologist (see (14), Table SI). Disease severity was assessed by a dermatologist (clinician-rated) and by patients (self-reported) as "mild", "moderate" or "severe". Itch was assessed by asking whether patients currently experienced itch (yes/no). Visibility of the skin condition was assessed by self-report items asking where patients have flares: face/neck, scalp, and/or hands/arms (visible); torso, legs/feet, and/or genital area (non-visible). Disease duration was assessed by subtracting self-reported age of onset from self-reported age.

Psychological variables: mood-related. Presence of depression and anxiety was screened using the Patient Health Questionnaire 2 (PHQ-2) and the General Anxiety Disorder 2-item (GAD-2) Assessment (25), using a cut-off score of ≥3 for screened depression or anxiety. Perceived stress was assessed with the 10-item Perceived Stress Scale (PSS (26)). Presence of suicidal ideation was assessed by asking "did you ever have suicidal ideation" (18).

Psychological variables: appearance-related. The 7-item Dysmorphic Concern Questionnaire (DCQ (27)) was used to assess excessive preoccupations with a perceived defect in physical appearance (i.e. dysmorphic concerns). Satisfaction with appearance was assessed on a 5-point scale asking participants "overall, how satisfied are you with your appearance?" (18).

Statistical analysis

Independent samples *t*-tests were used to compare levels of perceived stigmatization in the overall sample of patients vs skin-healthy controls. Multivariate regression analyses were conducted taking into account potentially confounding sociodemographic (i.e. age, sex, educational level, marital status), health-related (i.e. current health state) and psychological (i.e. screened depression, screened anxiety, perceived stress) variables (18). A hierarchical model was constructed in which confounding variables were included in Block 1, and group (patients vs skin-healthy controls) in Block 2.

To compare levels of perceived stigmatization between patients and skin-healthy controls for separate dermatological diagnoses, a hierarchical multivariate regression analysis was conducted with all dermatological diagnoses (dummy coded with skin-healthy controls as reference group) in Block 1, adding potential sociodemographic and health-related confounders in Block 2, and psychological confounders (specified above) in Block 3. Dermatological diagnoses were added in the first block to show results with and without controlling for confounder variables. To examine the relative contribution of 5 categories of predictors of perceived stigmatization in patients with dermatological conditions, a hierarchical multivariate regression analysis with each category entered in a consecutive step was conducted, with perceived stigmatiza-

Table I. Sample characteristics of patients and skin-healthy controls

	MD *n*	Patients *n*=5,487	Controls *n*=2,808	*p*-value
Sex, female, *n* (%)	55	3,099 (57.0)	1,877 (67.0)	<0.001
Age, years, mean (SD)	77	48.7 (17.6)	43.1 (15.6)	<0.001
Marital status, *n* (%)	211			
Single		1,799 (33.8)	797 (28.9)	<0.001
Married/with partner		3,529 (66.2)	1,959 (71.1)	
Education, *n* (%)	614			
Without possibility to go to college		1,542 (30.2)	420 (16.3)	<0.001
With possibility to go to college		1,635 (32.0)	675 (26.3)	
University		1,935 (37.9)	1,474 (57.4)	
Physical comorbidities, yes	201	2,546 (47.4)	753 (27.6)	<0.001
BMI, kg/m^{2a}, mean (SD)	394	26.5 (5.4)	24.6 (4.4)	<0.001

[a]Controlled for age and sex.
MD: missing data; SD: standard deviation; BMI: body mass index.

Table II. Perceived stigmatization scores of dermatological patients overall (*n*=5,487), across specific skin diseases (in order of their overall sample size), and among skin-healthy controls (*n*=2,808)

	PSQ Total scale			PSQ Absence of friendly behaviour			PSQ Confused/staring behaviour			PSQ Hostile behaviour		
Diagnosis	Mean	SD	*n*	Mean	SD	*n*	Mean	SD	*n*	Mean	SD	*n*
All patients	17.08	11.42	5,191	10.54	6.98	5,174	4.95	6.33	5,233	1.61	2.82	5,243
Psoriasis	20.54	12.45	1,363	12.01	7.37	1,355	6.93	7.26	1,366	1.66	2.95	1,373
Non-melanoma skin cancer	12.37	9.29	436	9.38	7.62	430	1.86	3.83	436	1.15	2.36	443
Atopic dermatitis	19.48	11.96	345	10.45	6.50	343	7.22	6.82	346	1.79	2.89	345
Eczema (other than AD)	16.11	11.16	243	10.28	7.17	239	4.35	6.00	244	1.35	2.47	247
Infections	14.91	9.55	232	10.50	6.75	233	3.16	5.08	237	1.35	2.30	236
Acne	16.94	11.44	233	10.30	6.59	231	4.46	5.62	236	2.14	3.40	234
Naevi	13.23	8.65	221	9.81	5.98	221	1.92	3.74	223	1.48	2.81	222
Benign tumours	14.47	9.57	209	10.32	6.63	212	2.54	4.00	212	1.61	2.58	211
Connective tissue disease	15.19	9.52	207	10.18	6.52	206	3.98	5.48	209	1.07	2.01	215
Urticaria	15.56	10.17	162	9.06	6.40	164	4.76	5.54	165	1.89	3.26	163
Bullous disease	19.14	12.25	136	10.32	7.54	133	7.18	7.13	137	1.60	3.04	138
Hidradenitis suppurativa	19.30	11.71	135	11.17	7.14	135	5.59	6.39	135	2.61	3.16	135
Prurigo	16.58	12.07	124	8.96	5.96	122	5.97	6.95	123	1.70	2.89	125
Scaly conditions	15.13	9.21	114	10.12	6.49	115	3.61	4.51	117	1.37	2.88	115
Allergies/hypersensitivity	14.33	11.15	114	9.32	8.20	114	3.85	5.03	116	1.11	2.64	114
Pruritus	15.83	9.46	106	10.56	6.26	105	3.57	4.94	109	1.51	2.18	107
Metabolic/systemic disease	14.43	9.01	101	9.30	5.74	100	3.39	4.53	101	1.71	3.14	101
Malignant melanoma	13.04	9.11	86	9.88	7.59	87	2.15	3.62	91	1.17	2.26	87
Rosacea	15.54	10.22	87	9.27	6.98	87	4.93	5.71	86	1.28	2.61	87
Alopecia areata	20.16	11.31	83	10.57	5.27	83	7.76	7.35	83	1.83	2.82	83
Venous insufficiency	18.44	10.50	69	10.73	6.71	69	6.05	6.49	71	1.83	2.87	69
Hand eczema	14.74	9.87	70	8.77	4.88	70	4.44	5.16	70	1.53	2.51	70
Other alopecias	18.42	12.46	64	10.98	6.66	63	5.89	7.81	64	1.74	2.68	64
Seborrhoeic dermatitis	15.80	11.21	53	9.67	6.29	56	4.27	6.06	55	1.83	2.95	58
Skin malformations	15.35	10.45	49	8.41	5.40	49	5.12	6.61	50	2.04	3.14	50
Vitiligo	20.61	14.21	48	12.10	7.38	49	6.35	8.26	47	1.94	3.36	48
Hyperhidrosis	17.65	13.39	26	8.35	5.29	26	5.42	6.99	26	3.89	3.81	26
Psychodermatological conditions	20.63	14.73	17	11.23	7.73	18	7.80	8.08	19	2.94	5.13	17
Others	14.21	10.10	58	10.49	6.78	59	2.37	4.15	59	1.45	2.73	60
Skin-healthy controls	14.14	8.40	2,711	9.88	5.41	2,714	2.66	3.99	2,715	1.61	2.44	2,729

AD: atopic dermatitis; SD: standard deviation; PSQ: Perceived Stigmatization Questionnaire.

tion (total PSQ) as the dependent variable: 1: sociodemographic (age, sex, educational level, marital status); 2: disease-related (clinician-rated and self-reported disease severity, visible and invisible flares, itch, disease duration); 3: general health-related (BMI, current health state, comorbidity); 4: psychological: mood-related (perceived stress, screened anxiety, screened depression, suicidal ideation); and 5: psychological: appearance-related (body dysmorphic concern, satisfaction with appearance).

All analyses were conducted after applying a square root transformation on perceived stigmatization scores due to substantial positive skewness. For all multivariate analyses, primary analyses included all cases, and sensitivity analyses excluded multivariate outliers and/or cases with standardized residuals >3.29. Due to the Mahalanobis distance not being suitable to detect multivariate outliers in models containing high numbers of dichotomous variables, it was calculated based on only the included continuous variables (28). Analyses were conducted using IBM SPSS 27 (Armonk, New York, USA).

RESULTS

Sociodemographic and disease-related characteristics

Sociodemographic characteristics of study participants are reported in **Table I**. On average, patients were more often male, older, single, had a lower level of education, reported more physical (co)morbidities, and had a higher BMI than skin-healthy controls (all p-values < 0.001). The most common skin conditions were psoriasis (25.6%), non-melanoma skin cancer (8.9%), atopic dermatitis (6.4%), other types of eczema (4.7%), and infections (4.5%) (14).

Perceived stigmatization in patients compared with skin-healthy controls

Overall sample. Perceived stigmatization scores of dermatological patients overall (n=5,487), across specific skin diseases, and among skin-healthy controls, are shown in **Table II**. Patients with skin conditions reported significantly higher levels of perceived stigmatization than controls on the total PSQ (t(7900)=–11.06, p<0.001, d=0.26), and on the subscales absence of friendly behaviour (t(7886)=–2.91, p=0.004, d=0.07) and confused/staring behaviour (t(7946)=–17.04, p<0.001, d=0.40). Sensitivity analyses excluding univariate outliers yielded similar results and did not alter significance levels. Due to substantial floor effects on the subscale hostile behaviour, scores on this subscale were dichotomized into participants scoring 0 (n=4,590) and >0 (n=3,382) and differences between patients and controls were analysed using χ^2 tests. Skin-healthy controls had non-zero scores on the hostile behaviour subscale more often than patients with skin conditions (χ^2(1, 7,972)=38.11, p<0.001).

Taking into account potential confounding variables in a multivariate regression analysis, patients scored significantly higher than controls on overall perceived stigmatization (Total PSQ: β=0.03, p=0.02), and on separate subscale confused/staring behaviour (β=0.10, p<0.001); however, patients scored lower than controls on subscale absence of friendly behaviour (β=–0.03, p=0.04). Sensitivity analyses yielded similar results and did not alter significance levels.

Specific dermatological diagnoses. Results of the multivariate regression analysis comparing specific dermatological diagnoses with skin-healthy controls are shown in **Table III**. In Block 1 (not including confounding variables), patients with psoriasis, acne, atopic dermatitis, bullous disorders, hidradenitis suppurativa (HS), eczema (other than atopic dermatitis), prurigo, pruritus, alopecia areata, other alopecias, venous insufficiency, vitiligo,

Table III. Levels of perceived stigmatization (Perceived Stigmatization Questionnaire (PSQ) total score) in patients with skin conditions compared with skin healthy-controls (Total *n*=6878) in a multiple regression analysis including and excluding confounding variables

	Standardized regression coefficients (β)		
Variables	Block 1	Block 2	Block 3
Dermatological diagnosis[a]			
Psoriasis	0.23***	0.15***	0.13***
Non-melanoma skin cancer	–0.05***	–0.04**	–0.02*
Atopic dermatitis	0.11***	0.04***	0.03*
Eczema (other than AD)	0.03*	–0.00	–0.00
Infections	0.02	–0.01	–0.01
Acne	0.03**	–0.00	–0.02*
Naevi	–0.01	–0.02*	–0.02
Benign tumours	0.01	–0.00	–0.00
Connective tissue disease	0.01	–0.02	–0.02
Urticaria	0.02	–0.00	–0.02
Bullous disorders	0.07***	0.05***	0.04***
Hidradenitis suppurativa	0.07***	0.03*	0.01
Prurigo	0.03*	0.01	0.00
Scaly conditions	0.01	–0.01	–0.02
Allergies/hypersensitivity	–0.00	–0.02	–0.04**
Pruritus	0.02*	–0.00	–0.00
Metabolic/systemic disease	0.01	–0.02	–0.02
Malignant melanoma	–0.01	–0.01	–0.01
Rosacea	–0.00	–0.01	–0.02
Alopecia areata	0.07***	0.05***	0.04**
Venous insufficiency	0.03*	0.01	0.01
Hand eczema	0.01	0.00	–0.00
Alopecias, other	0.04**	0.03*	0.02*
Seborrhoeic dermatitis	0.01	0.01	0.00
Skin malformations	–0.00	–0.01	–0.00
Vitiligo	0.04**	0.02*	0.02
Hyperhidrosis	0.02*	0.00	–0.01
Psychodermatological conditions	0.03*	0.01	0.01
Others	–0.00	–0.01	–0.01
Potential confounding variables			
Age		–0.12***	–0.07***
Sex[b]		–0.03*	–0.07***
Educational level: moderate[c]		0.03*	0.04**
Educational level: high[c]		–0.00	0.02
Marital status[d]		–0.05***	–0.05***
Current health state		–0.29***	–0.15***
Perceived stress			0.29***
Screened depression			0.06***
Screened anxiety			0.01
F-change	17.60***	116.26***	233.24***
R^2	0.07	0.16	0.23

Block 1 includes dummy variables of individual patient diagnoses with skin-healthy controls as the reference group; statistically significant positive Beta values show that the patient group has significantly higher perceived stigmatization scores than skin-healthy controls and negative Beta values show that the patient group has significantly lower perceived stigmatization scores than skin-healthy controls. Block 2 takes the influence of potential sociodemographic and health-related variables into account, and Block 3 additionally includes psychological confounding variables. [a]Reference group=skin-healthy controls; [b]reference group=male; [c]reference group=low education; [d]reference group=being single.
AD: atopic dermatitis. ***p<0.001, **p<0.01, *p<0.05.

hyperhidrosis, and psychodermatological conditions had significantly higher levels of perceived stigmatization than skin-healthy controls, while patients with non-melanoma skin cancer (NMSC) scored significantly lower than controls. In Block 3 (including sociodemographic, health-related and psychological confounders), patients with psoriasis, atopic dermatitis, bullous disorders, alopecia areata, and other alopecias, had significantly higher levels of perceived stigmatization than skin-healthy controls, while patients with NMSC, acne, and allergies scored significantly lower than controls. Sensitivity analyses did not alter statistical significance levels.

Predictors of perceived stigmatization in patients with dermatological conditions

Results of a multivariate regression analysis that examined potential predictor variables of perceived stigmatization are shown in **Table IV**. The final model, including all predictor variables (Block 5), explained 32.6% of the variance, and showed that perceived stigmatization could be predicted by sociodemographic (lower age, male sex, being single), disease-related (higher disease severity, presence of itch, longer disease duration), general health-related (higher BMI, lower overall health) and psychological variables (higher perceived stress, presence of suicidal ideation, higher levels of body dysmorphic concerns, lower satisfaction with appearance). Sensitivity analyses did not change the results in terms of statistical significance, except for the predictor "age" ($\beta = -0.03$, $p = 0.06$).

DISCUSSION

This study assessed perceived stigmatization and its sociodemographic, health-related, disease-related, and psychological predictors among the largest sample of outpatients with skin diseases to date, across 17 European countries. Results showed that patients with skin disease experience greater levels of stigmatization than skin-healthy controls, although the level of stigmatization varies across different skin conditions. Patients with psoriasis, acne, atopic dermatitis, bullous disorders, hidradenitis suppurativa (HS), eczema (other than atopic dermatitis), prurigo, pruritus, alopecia areata, other alopecias, venous insufficiency, vitiligo, hyperhidrosis, and psychodermatological conditions had significantly higher levels of perceived stigmatization than skin-healthy controls in analyses without controlling for confounders. In analyses taking into account sociodemographic, health-related and psychological confounders, especially patients with psoriasis, atopic dermatitis, alopecia, and bullous disorders scored high in comparison with skin-healthy controls. This is in line with results from studies

Table IV. Predictors of perceived stigmatization (Perceived Stigmatization Questionnaire (PSQ) total score) in patients with skin diseases: results of a multiple regression analysis

	Standardized regression coefficients (β)				
Predictors	Block 1	Block 2	Block 3	Block 4	Block 5
Sociodemographic					
Age (cont)	−0.09***	−0.11***	−0.15***	−0.08***	−0.03*
Sex (M/F)	−0.01	−0.01	−0.03	−0.07***	−0.09***
Education (moderate[a])	0.03	0.04*	0.04*	0.04*	0.02
Education (high[a])	−0.03	0.00	0.02	0.04*	−0.00
Married/with partner (N/Y)	−0.06***	−0.06***	−0.04**	−0.03*	−0.03*
Disease-related					
Clinical disease severity (moderate)		0.06**	0.04*	0.04*	0.02
Clinical disease severity (high)		0.11***	0.07***	0.07***	0.04*
Self-assessed disease severity (moderate)		0.09***	0.04*	0.02	0.01
Self-assessed disease severity (high)		0.15***	0.07***	0.04*	0.03
Visible flares (N/Y)		0.03	0.03*	0.02	0.00
Non-visible flares (N/Y)		0.03*	0.01	0.01	0.00
Itch (N/Y)		0.10***	0.07***	0.05**	0.04**
Disease duration (cont)		0.10***	0.09***	0.07***	0.04**
General health-related					
BMI (cont)			0.06***	0.06***	0.04**
Current health state (cont)			−0.27***	−0.14***	−0.09***
Comorbidity (N/Y)			0.01	−0.02	−0.01
Psychological: mood					
Perceived stress (cont)				0.28***	0.20***
Screened depression (N/Y)				0.04*	0.02
Screened anxiety (N/Y)				0.02	−0.00
Suicidal ideation (N/Y)				0.08***	0.06***
Psychological: appearance					
Body dysmorphic concerns (cont)					0.23***
Satisfaction with appearance (cont)					−0.13***
F-change	14.40***	44.42***	105.51***	109.97***	177.06***
R^2	0.02	0.10	0.17	0.25	0.32

Block 1 contains potential sociodemographic predictors of perceived stigmatization, in Block 2 disease-related predictor variables are added to the model. Block 3 additionally includes general health-related variables, and lastly the mood-related (Block 4) and appearance-related (Block 5) psychological predictor variables are added.
[a]Reference group=low education.
cont: continuous variable; M: male; F: female; N: no; Y: yes; BMI: body mass index. ***$p < 0.001$; **$p < 0.01$; *$p < 0.05$.

with no control group in smaller samples (2, 9, 29), and highlights the burden of perceived stigmatization in less-often studied conditions, such as alopecia (30) and bullous conditions (31).

Consistent with previous research, between-group differences in stigmatization were mostly driven by the PSQ subscale confused/staring behaviour (22, 32), suggesting that perceived stigmatization is best captured by experiences of others staring and acting confused, while absence of friendly, or hostile, behaviour is less common.

Psychological factors such as body dysmorphic concerns and distress were the strongest predictors of perceived stigmatization, probably reflecting both their contribution to stigmatization and the psychological impact of stigmatization. For example, perceived stigmatization may lead to enhanced appearance concerns. However, body dysmorphic disorder is common in skin conditions (14) and one of its core features is the continuous awareness of others looking at appearance defects, which could lead to misinterpretation of ambiguous social situations (33) and thereby increased reporting of perceived stigmatization. Similarly, higher levels of distress and presence of suicidal ideation may lead to a negative evaluation of social interactions (34), resulting in greater self-reported perceived stigmatization. Overall, the current results corroborate previous studies underlining perceived stigmatization as a cause for significant distress and appearance concerns, and as a contributing factor towards suicidal ideation (35), highlighting the importance of screening for psychological problems in dermatological practice. Although depression and anxiety were associated with stigmatization (in line with previous research (5)) they were not predictive in multivariate analyses. This may be due to the predictor suicidal ideation pulling in the shared variance in these variables. Prospective studies are recommended to disentangle cause and effect in the complex and potentially reciprocal relationship between perceived stigmatization and psychological factors.

Perceived stigmatization could be predicted by sociodemographic (i.e. male sex, lower age, being single), disease-related (presence of itch, longer disease duration, high clinician-rated disease severity), health-related (i.e. higher BMI, lower overall health), and psychological (more perceived stress, suicidal ideation, body dysmorphic concerns, lower appearance satisfaction) variables. This confirmed some predictors found in smaller studies in singular diagnoses (e.g. lower age, higher disease severity, mood-related psychological variables (2, 5)), and highlighted the relevance of scarcely or never examined predictors including appearance-related psychological variables and general health-related variables. The fact that general health-related variables had similar or higher predictive value in the current model than disease-specific factors was noteworthy and may have been due to double stigma (15, 16, 36).

Study limitations

Study limitations are described in our previous publication (14). Specific for this publication, the generic perceived stigmatization measure that was used may have underestimated the extent of perceived stigmatization (22, 32) and led to results less directly comparable with previous research using disease-related instruments (23). In addition, the lack of a minimal clinically important difference threshold for the current study outcome precluded evaluation of the clinical relevance of differences in perceived stigmatization. Furthermore, it was beyond the capacity of study personnel to evaluate whether patients who screened positive on the PHQ-2 met the clinical criteria for a depressive disorder. Lastly, the analyses comparing patients with controls took potential psychological confounders into account, which are also known consequences of stigmatization. Therefore, correcting for these confounders is stringent, and the results should be interpreted with caution, also considering that some of the dermatological conditions that did not differ significantly from controls after controlling for psychological variables (e.g. vitiligo, acne, hidradenitis suppurativa) have shown to be stigmatized in previous studies in uncontrolled samples (3, 5). Other factors, including small sample size for individual diagnoses limiting power and external validity (14) and the related fact that certain patient groups (e.g. acne) may be under-represented in tertiary centres, may have played a role in these results.

Recommendations for future research and practice

Future research should focus on the impact of perceived stigmatization in longitudinal designs to gain understanding of the associated long-term life course impairment (37) and on development of evidence-based interventions to reduce stigmatization and improve quality of life of dermatological patients (4). In the current study, comparison between dermatological diagnoses and across countries was limited due to occasionally smaller sample sizes and heterogeneity in, for example, disease- and treatment characteristics, sociodemographic variables, culture, and/or comorbidities, underlining the need for future research within and across different conditions. Despite the broad overview of sociodemographic, disease-related, health-related and psychological factors presented in this study, some factors that may influence the extent and experience of stigmatization were beyond the scope of the current study, including dermatological treatment aspects, sociocultural factors, religion, and skin colour (3, 38). For example, certain skin conditions may be more or less visible in patients, depending on their skin colour, and in some cultures visible skin conditions may be associated with a curse (3). Further research regarding these factors, and in other geographical locations, is recommended to gain insight into region- and culture-specific aspects of perceived stigmatization and its determinants.

Lastly, considering that some of the physical and mental health-related factors associated with perceived stigmatization in dermatological patients are known to be stigmatized in themselves (8, 39), there is a need for overarching research into the effects of perceived stigmatization across the boundaries of specific diagnoses, and for examining outcomes for patient groups that may be especially burdened by stigmatization.

In clinical practice, healthcare providers should be vigilant about patients with perceived stigmatization and its associated psychological impact in dermatological consultations. Vulnerable patient groups include younger male, single, overweight patients with longstanding disease, appearance concerns, and itch. Additional psychological assessment and multidisciplinary management is advised when patients report a psychological burden due to feeling stigmatized, considering the relationship between perceived stigmatization, suicidal ideation, and psychological distress found in this study and in previous research (5, 9).

Conclusion

This large European multicentre study demonstrated that perceived stigmatization is increased in patients with skin conditions in comparison with skin-healthy controls, particularly among patients with psoriasis, atopic dermatitis, alopecia, and bullous disorders. A broad range of sociodemographic, health-related, disease-related, and psychological predictors have been identified. This will help clinicians and policymakers to target vulnerable patient groups, offer adequate patient management, and to ultimately develop evidence-based interventions to improve quality of life of these patients.

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The study was approved by the Institutional Review Board of the Department of Medicine at the University of Giessen (protocol number 87/17), and at each recruitment centre.

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