ORIGINAL ARTICLE

Happiness in dermatology: a holistic evaluation of the mental burden of skin diseases

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Abstract

Background According to the World Health Organization, mental health is a state of well-being and not merely the absence of disease. However, studies exploring subjective well-being in patients with skin diseases are very rare.

Objectives To assess subjective well-being, i.e. 'happiness', in patients with different skin diseases and to compare them to other patient groups and healthy controls.

Methods A cross-sectional study was conducted from 12/2017 to 04/2019. Patients receiving in- or outpatient care for psoriasis, atopic eczema, nummular eczema, mastocytosis, skin cancer (malignant melanoma and keratinocyte carcinoma), human immunodeficiency virus (HIV) or chronic inflammatory bowel diseases (Crohn's disease and ulcerative colitis) were recruited at two hospitals in Bavaria, Germany. Healthy individuals living in or near Munich served as a control group. All participants filled in a questionnaire assessing happiness, measured as positive affect (PA), negative affect and satisfaction with life (SWL; together representing subjective well-being) and a heuristic evaluation of one's own happiness.

Results Data from 229 dermatologic patients (53.3 ± 18.5 years, 48% women), 49 patients with inflammatory bowel diseases (48.9 ± 18.7 years, 43% women), 49 patients with HIV (46 ± 10.1 years, 10% women) and 106 healthy controls (38.4 ± 13.4 years, 49% women) were analysed. Compared to the controls, dermatologic patients reported lower heuristic happiness ($P = 0.023$) and PA ($P = 0.001$) but higher SWL ($P = 0.043$). Patients with psoriasis and atopic eczema reported the lowest happiness, as they reported significantly lower PA ($P = 0.032$ and $P < 0.001$) and heuristic happiness ($P = 0.002$ and $P = 0.015$) than the control group. Patients with skin cancer reported higher SWL than the control group ($P = 0.003$). Dermatologic patients reported lower happiness than patients with HIV but reported greater happiness than patients with IBD.

Conclusions Dermatologic patients experience lower levels of happiness, especially PA, compared to healthy controls. As PA is linked to desirable health outcomes, targeting PA could be a promising holistic approach for the treatment of skin diseases.

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Conflict of interest

The authors declare no conflict of interest.

Introduction

Patients with skin diseases have a higher risk for mental comorbidities such as depression, anxiety and addiction.[1–4] While there is a growing body of research on this topic, it is striking that almost all studies exploring the mental burden of skin diseases focused on assessing mental disorders.[2,5–7] However, considering the World Health Organization's (WHO) definition of health as a 'state of well-being and not merely the absence of disease',[8]

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such studies are only able to provide a partial assessment of the full mental burden of skin diseases. Studies measuring mental health in terms of subjective well-being are almost absent in dermatologic research so far.

While there are different definitions, happiness is often defined as subjective well-being,[9] which represents 'a person's cognitive and affective evaluations of his or her life as a whole'.[10] Following this definition, subjective well-being is considered high if one experiences plenty of positive emotions, few negative emotions and is generally satisfied with one's life.[10,11]

Integrating well-being seems a promising approach, especially in dermatology, as studies have found significant relationships between psychosocial factors, mostly stress-related, on the occurrence, severity and progression of skin diseases and that psychological factors can play a role in the treatment of the diseases.[12–14] For example, a prospective study among 62 psoriasis patients over the course of 6 months showed that stressful periods were related to higher disease severity 4 weeks later, but only in patients who tend to worry or scratch.[15] Similarly, other studies showed that psoriasis patients who worry a lot are less responsive to psoralen and ultraviolet A (PUVA) therapy[16] and that listening to meditation audiotapes during phototherapy (UVB and PUVA) leads to better treatment results in patients with psoriasis.[17] In addition, positive affect (PA) has been shown to be associated with several desirable health outcomes, ranging from improved health behaviour and better cardiovascular health to better immune responses, quicker wound healing and reduced pain.[18–20] Apart from these beneficial outcomes, the well-being of patients is a valuable aim in itself. Thus, exploring well-being among affected patients utilizing diverse measures could greatly contribute to a better understanding and treatment of skin diseases.

However, in dermatologic research, happiness and subjective well-being have been widely neglected as outcome variables with only very few exceptions. Only one study measured PA in patients with psoriasis,[21] while three studies looked at negative affect (NA) and life satisfaction as components of well-being.[22–24] While these studies underline the importance of happiness as a patient-reported outcome, their informative value is limited as they measured only components of happiness, were restricted to only one patient group, lacked a control group and used self-reported scores of disease severity.

To gain a more balanced and valid view on the mental burden of skin diseases, this explorative study sought to assess happiness and subjective well-being holistically, using PA, NA, satisfaction with life (SWL) and a heuristic measure of happiness. We assessed patients with different skin diseases and compared them to patients with chronic non-dermatologic diseases as well as healthy controls. In addition, disease severity was documented by the attending physician using validated indices.

Materials and methods

This cross-sectional study was conducted from December 2017 to April 2019. The dermatologic diagnoses examined were psoriasis, atopic eczema, nummular eczema, mastocytosis and skin cancer (malignant melanoma and keratinocyte carcinoma). For comparison purposes, patients with chronic inflammatory bowel diseases (IBD: ulcerative colitis and Crohn's disease), which can be very physically demanding due to strong pain during flares,[25] patients with infection with human immunodeficiency virus (HIV) who due to antiretroviral therapy are mainly physically unimpaired[26] but may have been experiencing stigmatization[27,28] and a healthy control group were included.

Patients with skin diseases were recruited from the Department of Dermatology and Allergy and patients with HIV from the interdisciplinary HIV centre at University hospital of the Technical University of Munich, while patients with IBD were recruited from the Department of Internal Medicine II, Hospital Neumarkt in der Oberpfalz. Only patients aged 18 years or older, suffering from one of the examined diagnoses, receiving in- or outpatient medical care at the respective clinics were eligible to participate in this study. Patients meeting these criteria were asked by the attending physician or assistant to fill in a paper-based questionnaire. Patients unable to fill in the German paper-based questionnaire were excluded. Written informed consent was obtained from all patients prior to study inclusion.

Healthy individuals, who served as a control group, were recruited with the help of a recruitment service (TestingTime, Zurich, Switzerland). Only individuals aged 18 years or older living in the greater Munich area and not suffering from one of the examined diseases were eligible to participate. Participants in the control group filled in an online version of the paper-based questionnaire used for the patient groups. The TestingTime recruiting team was responsible for the recruitment and the financial compensation of the participants (3€ per person) but was not involved in the data collection. Only the participants of the control group (as recruited by TestingTime) received a financial compensation.

This study was conducted in accordance with the Declaration of Helsinki and was approved by the local ethics committee of the Technical University of Munich (reference number 424/17S).

Questionnaire

The questionnaire consisted of validated scales measuring happiness and subjective well-being. For the patients, the attending physician additionally documented diagnoses and, when clinical scores were available, disease severity based on the following scores: Psoriasis Area and Severity Index for psoriasis, Scoring Atopic Dermatitis for atopic dermatitis, Mayo score & Crohn's disease activity index for IBD and Centers of Disease Control and Prevention (CDC) stage for HIV. The respondents were further asked to report any comorbidities in the questionnaire.

Positive affect and NA were measured using the German version of the Positive and Negative Affect Schedule (PANAS),[29,30] which consists of 20 adjectives (10 representing PA, e.g. 'excited' and 'enthusiastic', and 10 representing NA, e.g. 'distressed' and 'upset'), each rated on a 5-point scale ranging from 1 ('very slightly or not at all') to 5 ('extremely'). The PANAS is the most commonly used instrument for measuring affect.[31,32] The two distinct subscales, PA and NA, showed good reliability in this sample with Cronbach's alphas of 0.92 and 0.86, respectively. As the PANAS measures rather specific emotions,[9] we additionally used the German version of the Scale of Positive and Negative Experience (SPANE), which measures PA and NA in a more comprehensive way using 12 more general items (e.g., 'pleasant' and 'unpleasant').[32] Both subscales of SPANE showed good reliability in this sample with Cronbach's alphas of 0.94 for PA and 0.88 for NA. For both the PANAS and SPANE, the items of each subscale were averaged to form an index if at least 80% of items were answered validly.

Satisfaction with life was measured using the SWL Scale (SWLS),[33] which consists of five items (e.g. 'in most ways my life is close to my ideal'), each rated on a seven-point scale ranging from 1 ('strongly disagree') to 7 ('strongly agree'). The scale showed good reliability in this sample ($\alpha = 0.88$), and the items were averaged to form an index if at least 80% of items were answered validly.

In addition to this theory-based operationalization of happiness, we included a measure of *heuristic happiness* in the form of a single question derived from the European Social Survey[34]: 'Taking all things together, how happy would you say you are?' Respondents could give their answer on an 11-point scale ranging from 0 ('extremely unhappy') to 10 ('extremely happy').

Statistics

In order to identify and eliminate potential errors in manual data digitalization, data collected via paper-based questionnaires were digitalized twice using Epi Info™ (CDC, Atlanta, GA, USA) and any discrepancies between the resulting datasets were sorted out. Patients suffering from more than one of the examined diseases were excluded from all further analyses to avoid ambiguous results. Differences in age and gender between the groups were analysed using a Student's *t*-test and a chi-squared test. For the analysis of PA and NA, we focused on the PANAS, because it is the most commonly used tool for measuring affect.[31,32] In case of divergent results, we also reported the results obtained with SPANE for a more comprehensive evaluation of subjective well-being (see also Table S1, Supporting Information for the detailed results of the SPANE). Analyses of Covariance (ANCOVAs) were used to compare the groups of participants while controlling for gender and age. Age- and gender-adjusted means (m_a) and partial eta squared (η^2) are reported. Planned contrasts were calculated to reveal differences between the groups. To increase comparability, z-standardized data are presented when appropriate. To analyse the relationship between disease severity and happiness, z-standardized clinical scores were entered into linear regression models, with the different happiness measures as outcomes and age and gender as covariates. Standardized regression coefficients (β) are reported.

A main symptom of clinical depression is the inability to feel happy.[35] To rule out potential confounding, we conducted a sensitivity analysis and excluded all participants suffering from depression (four in total: one psoriasis, one atopic eczema, one mastocytosis and one ulcerative colitis) as assessed using the provided information on comorbidities in the questionnaire. As the exclusion did not have significant influence on the results, we reported the final results including the depressed participants.

The level of significance was set at $\alpha = 0.05$ for all analyses. All statistical analyses were conducted using IBM SPSS Statistics Version 24 (IBM Corporation, Armonk, NY, USA).

Results

In total, 335 patients and 106 controls were recruited. Of those, eight patients affected by more than one of the examined diseases were excluded. Of the remaining 327 patients, 229 were dermatologic patients (52 psoriasis, 50 atopic eczema, 24 nummular eczema, 53 mastocytosis and 50 skin cancer), 49 patients had been diagnosed with IBD (28 Crohn's disease and 21 ulcerative colitis) and 49 patients with HIV. The examined groups differed significantly in terms of gender ($P < 0.001$) and age ($P < 0.001$; Tables 1 and 2).

Unadjusted means, medians, quartiles, minima and maxima of the examined happiness variables are displayed in Fig. 1.

Comparing dermatologic patients to patients with HIV, IBD and healthy controls

Taking all dermatologic diseases together, we found significant effects of group membership (patient groups and controls) on heuristic happiness ($\eta^2 = 0.028$, $P = 0.009$) and PA ($\eta^2 = 0.051$, $P < 0.001$), but not on NA ($\eta^2 = 0.004$, $P = 0.612$) and SWL ($\eta^2 = 0.010$, $P = 0.223$). Compared to the control group, dermatologic patients reported lower heuristic happiness ($P = 0.023$) and PA ($P = 0.001$) but higher SWL ($P = 0.043$; Table 3 and Fig. 2). No significant difference was found for NA ($P = 0.418$). Compared to the other patient groups, dermatologic patients reported significantly lower PA than patients with HIV ($P = 0.016$) and higher PA than patients with IBD, but this difference was not significant ($P = 0.08$). Dermatologic patients did not significantly differ from HIV and IBD patients regarding NA, SWL and heuristic happiness.

Comparing patients with different dermatologic diseases to healthy controls

When looking separately at the different dermatologic diseases compared to controls, we found effects of group membership on heuristic happiness ($\eta^2 = 0.050$, $P = 0.006$) and

Table 1 Participants' characteristics

	Dermatology total $n = 229$†	Inflammatory bowel diseases $n = 49$‡	HIV $n = 49$§	Control group $n = 106$
Age				
Mean + SD	53.3 ± 18.4	48.9 ± 18.7	46 ± 10.1	38.4 ± 13.4
18–29 years	29 (13%)	9 (18%)	2 (4%)	32 (30%)
30–44 years	43 (19%)	12 (25%)	20 (41%)	40 (38%)
45–64 years	80 (35%)	19 (39%)	25 (51%)	30 (28%)
65+ years	75 (33%)	9 (18%)	2 (4%)	4 (4%)
Gender				
Men	119 (52%)	27 (57%)	44 (90%)	54 (51%)
Women	109 (48%)	20 (43%)	5 (10%)	52 (49%)
Disease severity¶				
Mean + SD/%	PASI: 12.7 ± 9.6	CDAI: 102.7 ± 108.3	CDC stage A: 19 (46%)	–
	SCORAD: 42.3 ± 19.9	Mayo: 4.5 ± 3.5	CDC stage B: 7 (17%)	
			CDC stage C: 15 (37%)	

†Two missing cases for age, one missing case for gender, ‡Two missing cases for gender, §Eight missing cases for CDC stage, ¶Data on disease severity are only available for patients with psoriasis (Psoriasis Area and Severity Index, PASI; score ranging from 0 to 72; $n = 48$), atopic eczema (Scoring Atopic Dermatitis, SCORAD; score ranging from 0 to 103; $n = 45$), Crohn's disease (Crohn's Disease Activity Index, CDAI; score ranging from 0 to ₋600; $n = 28$), ulcerative colitis (Mayo score; score ranging from 0 to 12; $n = 19$) and human immunodeficiency virus (HIV; Centers for Disease Control and Prevention CDC stages; $n = 41$).

PA ($\eta^2 = 0.045$, $P = 0.011$), but not on NA ($\eta^2 = 0.025$, $P = 0.160$) and SWL ($\eta^2 = 0.032$, $P = 0.063$). Specifically, we found significantly lower heuristic happiness and PA in patients with psoriasis and atopic eczema compared to the control group (happiness: $P = 0.002$ and $P = 0.015$; PA: $P = 0.032$ and $P < 0.000$; Table 3 and Fig. 2). Patients with mastocytosis and nummular eczema reported lower PA compared to the controls, but the differences did not reach significance ($P = 0.050$ and $P = 0.081$). Patients with skin cancer reported significantly higher SWL than the control group ($P = 0.003$). Regarding patients with mastocytosis, elevated SWL did not reach significance in comparison with

the controls ($P = 0.074$). For NA, there were no differences between patients with skin diseases and the control group.

The role of disease severity

Taking all diagnoses with clinical scores for disease severity available together (psoriasis, atopic dermatitis, HIV and IBD), we found that higher disease severity was associated with lower PA ($\beta = -0.20$, $P = 0.007$). When differentiating between the diseases, we found a similar association with disease severity for patients with psoriasis ($\beta = -0.33$, $P = 0.041$) and IBD ($\beta = -0.49$, $P = 0.002$), but not for patients with atopic eczema ($\beta = 0.71$, $P = 0.694$) and HIV ($\beta = -0.36$, $P = 0.723$). Disease

Table 2 Patient characteristics of dermatologic patients

	Psoriasis $n = 52$†	Atopic eczema $n = 50$	Nummular eczema $n = 24$	Mastocytosis $n = 53$‡	Skin cancer $n = 50$
Age					
Mean + SD	48.7 ± 16.8	46 ± 21.2	60.8 ± 13.3	47.1 ± 13.7	68 ± 13.1
18–29 years	10 (20%)	14 (28%)	0	5 (10%)	0
30–44 years	9 (18%)	12 (24%)	4 (17%)	17 (33%)	1 (2%)
45–64 years	21 (41%)	12 (24%)	5 (21%)	21 (40%)	21 (42%)
65+ years	11 (22%)	12 (24%)	15 (63%)	9 (17%)	28 (56%)
Gender					
Men	31 (62%)	26 (52%)	14 (58%)	15 (29%)	32 (64%)
Women	20 (39%)	24 (48%)	10 (42%)	37 (71%)	18 (36%)
Disease severity§					
Mean + SD	12.7 ± 9.6	42.3 ± 19.9	–	–	–

†One missing case for age, ‡One missing case for age and gender, §Data on disease severity are only available for patients with psoriasis (Psoriasis Area and Severity Index, PASI; score ranging from 0 to 72; $n = 48$) and atopic eczema (Scoring Atopic Dermatitis, SCORAD; score ranging from 0 to 103; $n = 45$).
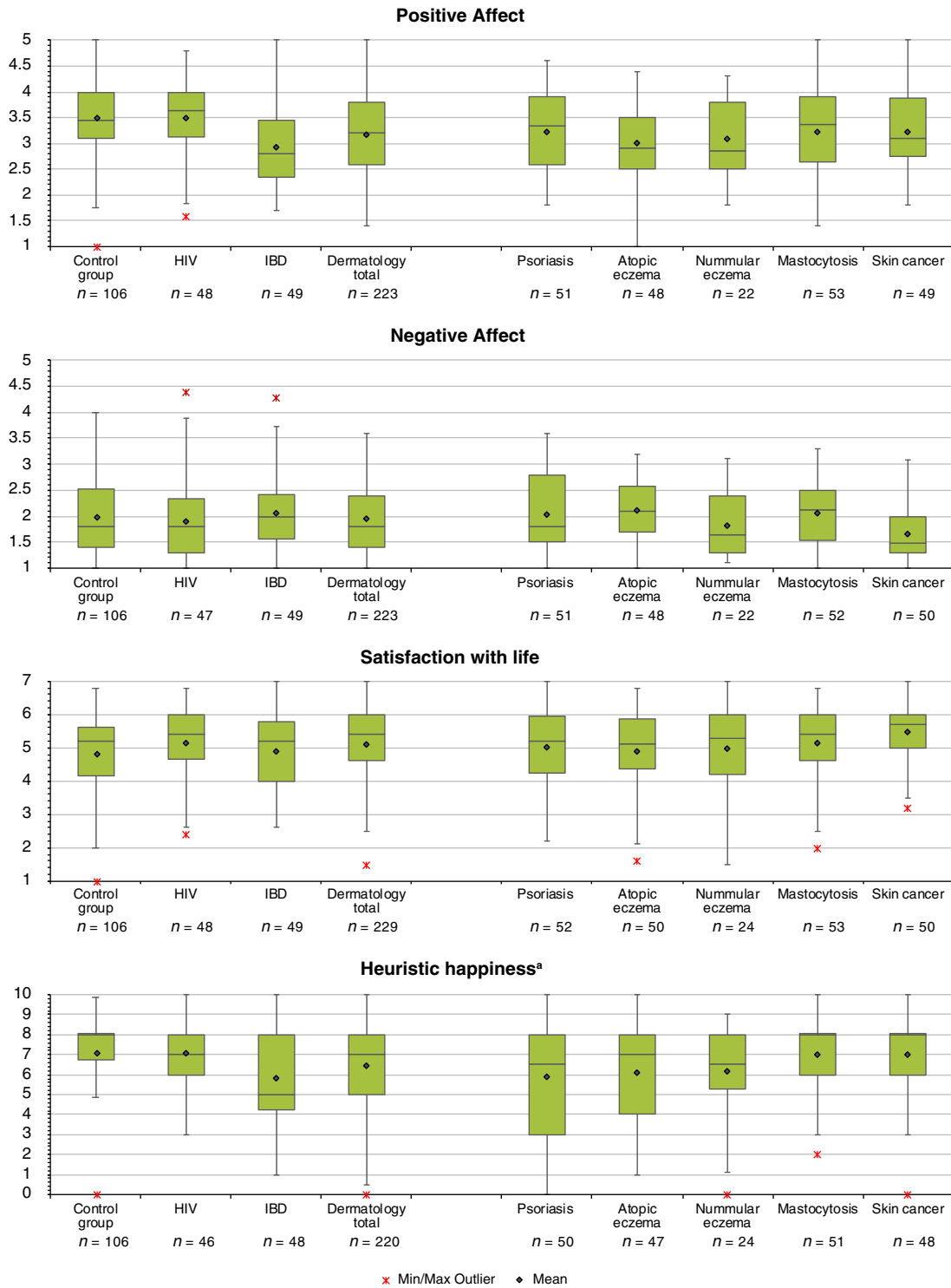
Figure 1 Unadjusted means, medians, quartiles and minima/maxima of positive affect, negative affect, life satisfaction and heuristic happiness. [a]Heuristic evaluation of own happiness on a scale ranging from 0 to 10.

Table 3 Descriptive statistics for the happiness measures (patient groups and healthy controls)

	Positive affect		Negative affect		Satisfaction with life		Heuristic happiness†	
	n, $m \pm$ SD	m_a	n, $m \pm$ SD	m_a	n, $m \pm$ SD	m_a	n, $m \pm$ SD	m_a
All diseases								
Dermatology total	223, 3.17 ± 0.76	3.18	223, 1.96 ± 0.66	1.99	229, 5.12 ± 1.17	5.13	220, 6.48 ± 2.34	6.47
Inflammatory bowel diseases	49, 2.95 ± 0.76	2.97	49, 2.08 ± 0.67	2.08	49, 4.93 ± 1.16	4.99	48, 5.81 ± 2.21	5.89
Human immunodeficiency virus	48, 3.51 ± 0.71	3.48	47, 1.91 ± 0.72	1.95	48, 5.14 ± 1.10	5.11	46, 7.09 ± 1.64	6.98
Healthy controls	106, 3.51 ± 0.71	3.49‡	106, 2.00 ± 0.71	1.93‡	106, 4.82 ± 1.26	4.83‡	106, 7.08 ± 2.06	7.11‡
Dermatologic diseases								
Psoriasis	51, 3.22 ± 0.79	3.20	51, 2.05 ± 0.77	2.08	52, 5.02 ± 1.14	5.02	50, 5.92 ± 2.81	5.85
Atopic eczema	48, 3.02 ± 0.66	3.01	48, 2.11 ± 0.60	2.09	50, 4.90 ± 1.35	4.89	47, 6.11 ± 2.35	6.09
Nummular eczema	22, 3.11 ± 0.73	3.16	22, 1.83 ± 0.63	1.89	24, 4.98 ± 1.45	4.99	24, 6.21 ± 2.40	6.20
Mastocytosis	53, 3.24 ± 0.84	3.22	52, 2.07 ± 0.60	2.06	53, 5.15 ± 1.10	5.18	51, 7.00 ± 1.80	7.07
Skin cancer	49, 3.24 ± 0.75	3.30	50, 1.66 ± 0.56	1.76	50, 5.50 ± 0.87	5.53	48, 7.02 ± 2.13	7.00
Healthy controls	106, 3.51 ± 0.71	3.48‡	106, 2.00 ± 0.71	1.96‡	106, 4.82 ± 1.26	4.81‡	106, 7.08 ± 2.06	7.07‡

†Evaluation of one's own happiness on a scale ranging from 0 to 10, ‡Due to the adjustment procedure, m_a of healthy controls differs depending on which groups they were compared to (all diseases or dermatologic diseases only).
Unadjusted means, standard deviation and age- and gender-adjusted means of the different happiness measures in the patient groups and the healthy controls. m, mean, m_a, age- and gender-adjusted means; SD, standard deviation.

severity was not associated with any of the other happiness measures.

Alternative measurement of affect with SPANE

When measuring PA and NA with SPANE (Table S1, Supporting Information), some results differed from those obtained with the PANAS. In contrast to the findings reported above, the difference between dermatologic patients ($m_a^{SPANE} = 3.57$) and healthy controls ($m_a^{SPANE} = 3.76$) regarding PA^{SPANE} did not reach significance ($P = 0.063$). Similarly, only patients with atopic eczema ($m_a^{SPANE} = 3.28$) reported significantly lower PA^{SPANE} than the healthy controls ($m_a^{SPANE} = 3.74$, $P = 0.001$), but not patients with psoriasis ($m_a^{SPANE} = 3.53$, $P = 0.16$). Regarding NA^{SPANE}, patients with atopic eczema ($m_a^{SPANE} = 2.55$) reported significantly higher values than the control group ($m_a^{SPANE} = 2.21$, $P = 0.019$), which was not observed when measuring NA with PANAS.

Discussion

This study sought to extend previous research on the mental burden of skin diseases, which so far has almost exclusively focused on mental comorbidities related to skin diseases, by taking a holistic approach and measuring well-being and happiness. We found that dermatologic patients reported lower levels of happiness than participants of a control group both when using a heuristic and a theoretical operationalization of happiness. This finding is in accordance with previous studies that also reported reduced subjective well-being in patients with chronic diseases.[36,37] Dermatologic patients further reported lower levels of happiness than patients with HIV but scored higher than patients with chronic inflammatory bowel diseases.

Positive and negative affect

Patients with skin diseases reported lower PA as measured by the PANAS, but no differences emerged regarding NA compared to healthy controls. This finding is especially interesting, as PA has been shown to be associated with several desirable health outcomes, such as improved health behaviour, quicker wound healing, better cardiovascular health and better immune responses.[18–20] Thus, increasing PA in patients with skin diseases could not only improve well-being, but might even lead to a better prognosis.[38]

There is large evidence on interventions to promote PA.[39,40] Interventions that have been found to be highly effective are, for example, a gratitude journal or interventions focusing on meaning or strength use in daily life.[39] While these and further interventions have been positively evaluated, they are yet to be adapted to dermatologic patients.

It has to be added that the scale used to measure PA in this study (PANAS) focused on high-arousal positive emotions (e.g., 'excited' and 'enthusiastic').[31] When measuring affect with more general items (e.g. 'positive and 'pleasant'), the differences regarding PA between dermatologic patients and healthy controls were less pronounced and not significant ($P = 0.063$). Thus, the effect of skin diseases on PA might at least to some degree be moderated by arousal.

Comparing dermatologic diseases

Taking all findings together, patients with psoriasis and atopic eczema seemed to have the lowest levels of happiness, as they reported lower PA and lower overall happiness compared to participants of the control group. This corroborates previous research that has shown that psoriasis and atopic eczema are associated with several mental disorders, such as depression,
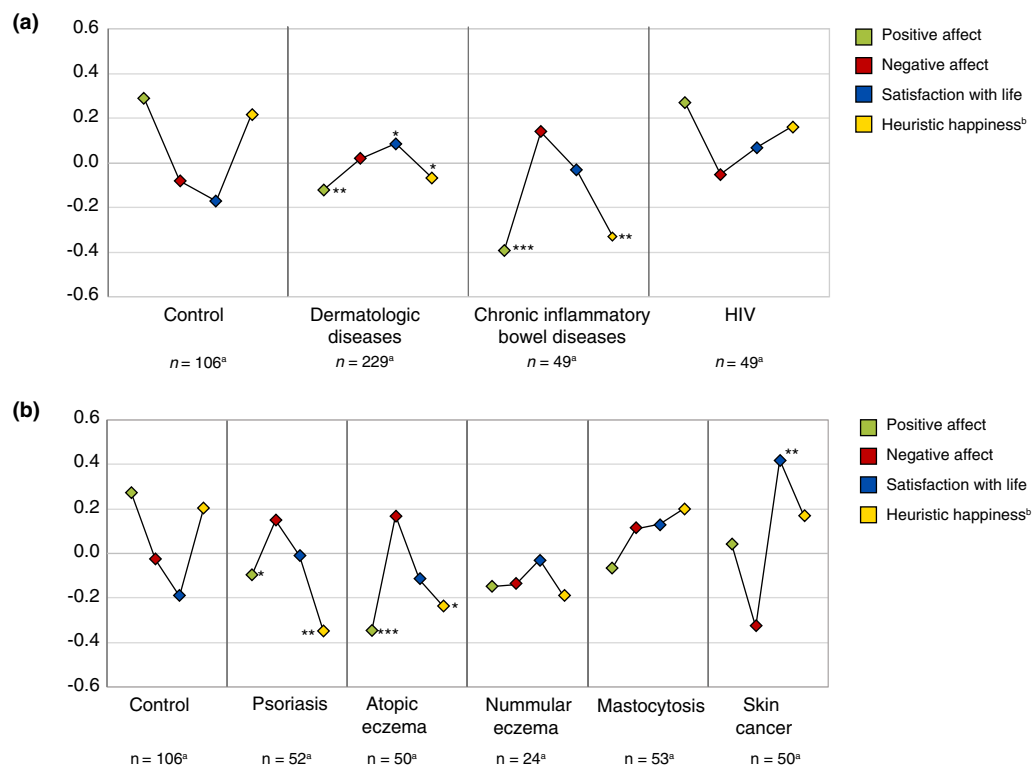
Figure 2 Patterns of well-being in (a) all participants (b) dermatologic patients. Z-standardized, and age- and gender-adjusted means are shown. Asterisks indicate significant differences compared to the control group: *$P < 0.05$, **$P < 0.01$, ***$P < 0.001$ [a]Case numbers for different variables slightly vary due to missing data and [b]heuristic evaluation of own happiness on a scale ranging from 0 to 10.

addiction and even suicidal ideation.[4,5,7] In contrast, patients with skin cancer seemed to be the least unhappy in this sample; this finding is in accordance with a study conducted by Wikman and colleagues who found that patients with diabetes and cancer had higher levels of happiness than patients with other diseases including stroke and lung diseases.[37]

Elevated satisfaction with life in patients with skin cancer

Surprisingly, skin cancer patients reported significantly higher levels of SWL than all other groups. Even though skin cancer is a potentially fatal diagnosis, the prognosis is usually favourable if tumours are detected early, especially, but not only, in cases of keratinocyte carcinoma.[41–43] Accordingly, patients might be relieved after treatment and, consequently, feel more satisfied with their lives. Another explanation for their high levels of life satisfaction could be that the emotionally charged diagnosis of cancer may trigger re-evaluation processes in the affected patients. This has been observed for patients diagnosed with other types of cancer such as breast and colorectal cancer.[44] However, re-evaluation processes in patients diagnosed with skin cancer, which has a very low mortality rate compared to breast and

colorectal cancer, might imply different kinds of emotions and cognitions which remain to be tested.

The group of skin cancer patients examined in this study was quite heterogeneous and patients with melanoma and keratinocyte carcinoma (including its different types) and different tumour stages were not differentiated due to sample size restrictions. As both types of skin cancer and tumour stage greatly impact treatment and prognosis,[42,43] it seems probable that these variables might influence emotional reactions and well-being as well. For verification, more detailed studies with larger sample sizes allowing a closer differentiation between melanoma and keratinocyte carcinoma and different tumour stages are necessary.

The role of dermatologic disease severity

Higher disease severity was associated with less PA in patients with psoriasis but not in patients with atopic eczema. Thus, patients with more severe forms of psoriasis tend to experience less PA than those with milder forms, whereas patients with atopic eczema are affected in the same way regardless of disease severity. On the one hand, this could be due to differences in the symptoms caused by psoriasis and atopic eczema. For example, Evers and colleagues found that patients with atopic eczema

reported higher levels of itch than patients with psoriasis.[45] However, they also found that itch hardly contributed to levels of distress in both patient groups. In contrast, they identified fatigue as an important factor causing psychological distress, which was more pronounced in patients with atopic eczema than psoriasis. This might explain why milder forms of atopic eczema might be more mentally straining than milder forms of psoriasis. On the other hand, Bahmer and colleagues found that patients with psoriasis and atopic eczema differed regarding personality and character traits, with patients with psoriasis being less ambitious and narcissistic and patients with atopic eczema being less self-critical than the population average.[22] In addition, psoriasis has been linked to alexithymia,[46,47] which involves difficulties in recognizing and describing emotions. Such psychometric differences might lead to different ways of perceiving and coping with the respective skin disease,[48] which could explain the different effects of disease severity on PA. Finally, Schut and colleagues[49] found that in patients with atopic eczema, illness perception was significantly associated with self-assessed, but not physician-assessed physical health. Thus, the perception of disease severity of AD seems to differ between patients and physicians, which could explain why we did not find an association between objectively assessed disease severity and PA in those patients.

Strengths and limitations

This study is one of the very few studies[21–24] to examine happiness and subjective well-being in the context of dermatology. As there is no uniform operationalization of happiness, this study used a theory-based and a heuristic approach as well as two different instruments for measuring affect to increase validity. Furthermore, due to the recruitment of a control group living in the same area as the dermatologic patients and age- and gender-adjusted analyses, a valid comparison with healthy controls was possible that did not rely on unadjusted norm data as was the case in other studies.[23] A comparison with two different patient groups further enhanced the informative value of the results obtained in this study. In addition, a sensitivity analysis was conducted in order to rule out depression as a potential confounder.

Still, this study is subject to several limitations. First, only dermatologic patients receiving in- or outpatient care at a university hospital were included. As a result, severe cases might have been over-represented in this sample. While patients with HIV were recruited from the same hospital, IBD patients were recruited from a municipal hospital located in a more rural area. Thus, regional differences could have confounded the results of the comparison with this patient group. Furthermore, patients with mastocytosis were contacted by mail. Again, this might have affected the results for this group. Participants of the control group filled in an online version of the paper-based questionnaire used in the patient groups. These different modalities of data collection could also have influenced the results in this study. Furthermore, depression was assessed using a question asking for current comorbidities, which implies that the respective diseases, in this case depression, have actually been diagnosed by a physician. Depressive symptoms or depressive tendencies were not assessed. Together with the fact that patients with acute clinical depression are less likely to seek medical help for non-mental health reasons than non-depressed individuals (even in case of severe diseases such as advanced cancer[50]), this probably explains the low prevalence of depression in this sample. Moreover, due to the cross-sectional nature of this study, we could not determine causality but only associations. Consequently, we could not ascertain whether skin diseases cause subjective well-being to decrease or whether individuals with low subjective well-being are more prone to developing skin diseases, e.g. due to psychoneuroimmunologic processes.[51] Finally, further variables influencing happiness, such as personality traits, which could potentially moderate the association between happiness and skin diseases,[31] had not been taken into account in this analysis. More detailed studies are needed to achieve a better understanding of their potential interaction with happiness in dermatologic patients.

Conclusion

The results of this study show that dermatologic patients tend to experience lower levels of happiness and especially PA compared to a healthy control group. As PA has been related to several desirable health outcomes, targeting PA in addition to the treatment of somatic symptoms is a promising approach for a holistic treatment of skin diseases.

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Supporting information

Additional Supporting Information may be found in the online version of this article:

Table S1. Descriptive statistics for positive and negative affect using an alternative measuring tool (SPANE).