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The Impact of Chronic Skin Disease on Daily Life (ISDL): a generic and dermatology-specific health instrument

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Conflicts of interest
None declared.

The ISDL is available from the first author upon request.

Summary

Background In dermatological research and clinical practice, there is a need for comprehensive self-report instruments that assess a broad spectrum of health implications of chronic skin diseases, including generic and skin-specific aspects of disease-related quality of life. The advantages of dermatology-specific, multidimensional instruments over generic instruments or single-dimensional quality-of-life measures are in the detailed and specific information they provide about health areas that are affected by the skin condition and that may change through therapeutic intervention.

Objectives The development of a multidimensional health status inventory for chronic skin diseases (Impact of Chronic Skin Disease on Daily Life, ISDL) is described. The dermatology-specific part of the inventory assesses dimensions of physical functioning, more specifically skin status, physical symptoms of itch, pain and fatigue and scratching responses as well as disease-related stressors like stigmatization. The generic part gauges dimensions of psychological functioning, disease-related impact, illness cognitions and social support by means of existing scales validated for other chronic diseases.

Methods Reliability and validity of the questionnaire were studied in various samples of patients with psoriasis and atopic dermatitis.

Results The ISDL showed high reliability and test–retest reliability in both patient groups. Convergent validity was indicated by moderate to strong correlations with other validated questionnaires. The scales proved sensitive to change both for dermatological ultraviolet B radiation therapy and cognitive behavioural treatment for itching.

Conclusion With its convincing results for reliability and validity the present evaluation supports the usefulness and applicability of the instrument for different chronic skin diseases.

In research on chronic skin diseases, attention is increasingly directed to the consequences of the conditions for the patient's quality of life. Findings generally indicate that relative to the general population – and in line with results in other chronic physical conditions – patients with chronic skin problems report lower levels of psychological and social well-being. Most of the research to date has focused on two highly prevalent diseases, psoriasis and atopic dermatitis (AD), conditions that are commonly accompanied by various physical and psychological limitations in daily life.[1–6]

Comparative studies often make use of generic quality-of-life questionnaires like the SF-36 to contrast syndromes.[7–9] However, these instruments are unsuitable for assessing dermatology-specific aspects of skin conditions. They, for instance, do not consider the severity and area of the affected skin or physical symptoms of itch, the most prevalent disease-related complaint in chronic skin diseases.[1,6–9] The same is true for dermatology- and disease-specific determinants of physical and psychological functioning. For example, habitual and persistent scratching in response to (chronic) itch tends to perpetuate or even aggravate the skin condition in patients with AD and other skin diseases.[10–13] In many patients the high visibility of the condition and the associated stigmatization and shame also constitute important determinants of diminished quality of life.[3,4,14,15] Besides these disease-specific factors, aspects that are also common to most chronic diseases are known to play a role in chronic skin diseases: specifically, illness cognitions of helplessness and low acceptance as well

as a lack of social support are important predictors of poor physical and psychological functioning.[3,4,11,15,16]

Consistent with biopsychosocial models of chronic diseases and related models for skin conditions,[3,4,10] researchers are increasingly considering both generic and dermatology-specific implications of chronic skin diseases. However, widely used quality-of-life scales, such as the Dermatology Life Quality Index (DLQI) or the Skindex, predominantly measure aspects of physical, psychological and social functioning.[17,18] Aspects of itch–scratch problems or perceived stigmatization are always assessed with separate questionnaires.[11,14,19] With the present study we sought to develop a reliable and valid self-report inventory that gauges the implications of the condition on daily living, by assessing common, generic and dermatology-specific health aspects of chronic skin diseases.

Patients and methods

Item generation and selection

Based on the literature on chronic skin diseases, an item pool was generated with self-constructed and adjusted items of existing questionnaires for the following dermatology-specific constructs: skin status, physical symptoms of itch, pain and fatigue, conscious and automatic scratch responses and perceived stigmatization.[11,14,19] To meet the criteria for scale construction, all items needed to contain positive statements in simple and clear terms, comprise fewer than 20 words, and be univocal and relevant to measure the construct under consideration. The initial item pool was evaluated by both health professionals and patients diagnosed with chronic skin diseases, resulting in 30 items eligible for further research. To assess the generic aspects of psychological functioning, the impact of the disease on daily life, illness cognitions and social support, we used scales of existing self-report questionnaires evaluating other chronic physical conditions.[16,20,21] All items were then tested in patients diagnosed with psoriasis ($n = 65$) or AD ($n = 77$) treated at our Department of Dermatology. The results of this pilot study showed all items to have sufficient variability with normal distributions (skewness and kurtosis $<1{\cdot}5$). In the present study, we subsequently weighed the items against the main psychometric criteria for the measurement properties of health status questionnaires,[22] including reliability standards of internal consistency and test–retest reliability of the scales, convergent validity for the relationship with related constructs as well as sensitivity to change for different treatments.

Patients and procedure

The data of patients over the age of 16 years who were treated at our dermatology outpatient department for psoriasis and AD formed the basis of the psychometric studies. All respondents completed the Impact of Chronic Skin Disease on Daily Life (ISDL) during a regular visit to our outpatient clinic.

The statistical analyses of internal consistencies and convergent validity were based on the data of 173 patients with psoriasis and 128 patients with AD, 60% and 69% of whom were women and with mean ages of 47·6 years (SD 14·6, range 17–84) and 34·95 years (SD 15·28, range 16–77), respectively. Most were married (75% and 49%, respectively) and educational levels were comparable with 78% and 66% having received between 7 and 12 years of formal education. Mean duration of illness for psoriasis was 17·1 years (SD 13·6, range 0–59) and for AD 20·5 years (SD 16·0, range 0–67). As was to be expected, the patients with AD were significantly younger ($t = -7{\cdot}26$, $P < 0{\cdot}001$) and less frequently married ($t = -4{\cdot}64$, $P < 0{\cdot}001$). The patients with AD also had a higher educational level than the patients with psoriasis ($t = 4{\cdot}59$, $P < 0{\cdot}001$). There were no significant group differences with regard to sex and duration of disease. These demographic characteristics are relatively representative for the populations under investigation.[1,15] To analyse test–retest reliability and sensitivity of the ISDL to change, the scale was subsequently administered to comparable AD and psoriasis samples (for more information, see results section). In view of the large number of statistical tests performed in both patient groups, a level of significance of $P < 0{\cdot}01$ was used in all analyses to correct for the number of tests.

Convergent validity measures

To assess convergent validity, in addition to the ISDL (see results section) several other validated self-report questionnaires were administered.

Disease activity was assessed by having patients indicate the extent and severity of skin involvement with regard to the main disease characteristics (such as redness and thickness) for each skin area (head, torso, arms and legs) separately on a four-point Likert scale (not at all to totally). These patient-assessed measures have been shown to correlate highly with clinically assessed indicators of disease activity (e.g. the Psoriasis Area and Severity Index, $r > 0{\cdot}70$).[23,24]

Disease-related quality of life was assessed with a Dutch version of the DLQI,[18] a 10-item scale measuring the impact of skin diseases on several physical, psychological and social aspects of daily life.

Anxiety and depression were measured with the same-named scales of the Symptom Checklist 90[25] and the personality characteristic of neuroticism was assessed with the Eysenck Personality Questionnaire.[26]

Results

ISDL content

The ISDL conceptually consists of the five core categories: physical functioning, psychological functioning, stressors, illness cognitions and social support, which each include subscales (Table 1). Apart from the 10-cm visual analogue scale

Table 1 Internal consistencies, means and SDs of the Impact of Chronic Skin Disease on Daily Life (ISDL) scales for the two patient samples

	Psoriasis			Atopic dermatitis		
	α	Mean	SD	α	Mean	SD
Physical functioning						
Skin status[a]	–	16·87	3·70	–	15·98	3·70
Physical symptoms						
Itch	0·81	8·30	3·87	0·83	9·74	3·62
Fatigue[a]	–	4·08	3·14	–	4·43	2·82
Pain[a]	–	2·48	2·77	–	2·66	2·63
Scratch response						
Conscious scratching	0·73	6·85	2·62	0·73	8·26	2·29
Automatic scratching	0·76	4·83	1·81	0·64	5·71	1·97
Psychological functioning						
Anxiety	0·86	20·60	5·99	0·87	20·85	5·62
Negative mood	0·92	4·96	4·69	0·86	4·02	3·55
Positive mood	0·91	10·47	4·63	0·88	11·57	4·67
Stressors						
Impact of disease on daily life	0·87	17·68	6·37	0·87	20·83	6·50
Stigmatization	0·88	10·38	3·90	0·84	9·96	3·30
Illness cognitions						
Helplessness	0·88	10·58	4·08	0·88	10·98	4·05
Acceptance	0·88	15·76	4·62	0·93	15·52	4·57
Perceived benefits	0·80	11·56	4·33	0·85	12·31	4·60
Social support						
Perceived support	0·84	15·16	3·98	0·88	15·96	3·15
Social network[a]	–	2·15	0·90	–	2·03	0·69

Theoretical scale range: skin status (9–36), itch (3–16), fatigue and pain (0–10), conscious and automatic scratch response (3–12), impact of disease on daily life (10–40), stigmatization (6–24), anxiety (10–40), negative and positive mood (0–24), helplessness, acceptance and perceived benefits (6–24), perceived support (5–20). Scores of the social network are categorized according to norm groups.[20]

[a]Internal consistencies were not assessed for the following scales: skin status (ratings for the affected skin at different body parts) and one-item scales [visual analogue scale (VAS) fatigue, VAS pain, social network index].

(VAS) for the physical symptoms and the five-point Likert scale for positive and negative mood, the response categories for all other scales have a four-point Likert-scale format.

Physical functioning

Skin status. This scale assesses the current extent and severity of the skin condition for nine different body parts (face, hairy scalp, neck, hands, arms, torso, legs, feet and genitals/anus). The sum score reflects the overall severity of the skin condition.

Physical symptoms of itch, pain and fatigue. The intensity and duration of itch during the past 4 weeks is measured with four items. For the less prevalent complaints of pain and fatigue a 10-cm VAS scale is used (no pain/fatigue to worst pain/fatigue ever experienced).

Scratch response. Conscious and automatic scratch responses during the past 4 weeks are assessed with separate scales. The three-item conscious scratching scale evaluates the frequency and duration of the scratching behaviour while the three-item automatic scratching scale gauges scratching behaviour to nonitching stimuli and unconscious scratching behaviour (e.g. scratching in the absence of itch or without being aware of it).

Psychological functioning

Psychological well-being is measured with the anxiety scale (10 items) and the negative and positive mood scale (six items per scale) of the Impact of Rheumatic Diseases on General Health and Lifestyle (IRGL)[20,21] which was in turn adapted from existing, generic instruments (e.g. State-Trait Anxiety Questionnaires).[27]

Stressors

Disease impact on daily life. This 10-item generic scale (also referred to as daily-life impact) has likewise been derived

from the IRGL[20,21] and measures the effect the condition has on activities of daily life including work, hobbies, holiday, sleep, sexuality, eating and relationships. Apart from the separate item scores, a total score can be calculated to reflect the overall impact of the disease on daily living.

Stigmatization. This six-item subscale gauges to what extent the respondent feels stigmatized by others as a result of his/her skin condition (item examples: Others are staring; Others avoid contact).

Illness cognitions

The Illness Cognition Questionnaire is applied to evaluate three chronic disease-related cognitions: helplessness (six items), acceptance (six items) and perceived benefits (six items).[16]

Social support

Qualitative and quantitative aspects of social support were charted with the IRGL scales – perceived support (five items) and social network (one index).[20,21] (See also the social support self-report inventory.[28])

Differences between chronic skin diseases

Means and SDs of all ISDL subscales for the two patient samples (psoriasis, $n = 173$ and AD, $n = 128$) are presented in Table 1. Apart from the subscales 'negative mood' in both samples and 'automatic scratch response' in the psoriasis group, which had a slightly skewed distribution, all other scales were normally distributed (skewness and kurtosis <1·5). A subsequent square root transformation of the scores on the two deviant subscales yielded a normal distribution. A between-group comparison of the ISDL scale scores showed that patients with AD had reported significantly more itch ($t = 3{\cdot}27$, $P < 0{\cdot}001$), had higher scores for scratch response (conscious $t = 4{\cdot}95$, $P < 0{\cdot}001$; automatic $t = 6{\cdot}40$, $P < 0{\cdot}001$) and had indicated higher daily-life impact levels ($t = 4{\cdot}14$, $P < 0{\cdot}001$). None of the outcomes for the other disease-specific subscales (skin status, pain, fatigue and perceived stigmatization) nor the generic subscales (psychological functioning, illness cognitions and social support) revealed any significant group differences.

Reliability

Reliability of the scales was analysed with Cronbach's α in both samples of patients with psoriasis ($n = 173$) and AD ($n = 128$) (Table 1). For most scales the internal consistency was relatively high (minimally 0·70), with an exception for the α of the automatic scratching scale for the patients with AD. However, even with 0·64 for the patients with AD the consistency for automatic scratching was still sufficient.

Intercorrelations

The magnitude of the correlations between all ISDL scales showed the subscales to have overall corresponding associations in both patient groups (Table 2).

Stability

To judge the stability of its scales, the ISDL was administered twice, with a 4-week interval, in an additional 54 patients with psoriasis (test–retest reliability). In view of this relatively short interval and the fact that during this period there were no changes in the patients' regular treatment, we expected no large disease-related changes. Product-moment correlations between the test–retest measures indeed showed that the scales were relatively stable ($P < 0{\cdot}001$): skin status ($r = 0{\cdot}64$), itch ($r = 0{\cdot}78$), fatigue ($r = 0{\cdot}56$), scratching response (conscious $r = 0{\cdot}69$, automatic $r = 0{\cdot}77$), psychological functioning (anxiety $r = 0{\cdot}82$, negative mood $r = 0{\cdot}64$, positive mood $r = 0{\cdot}78$), stressors (daily-life impact $r = 0{\cdot}79$, stigmatization $r = 0{\cdot}84$), illness cognitions (helplessness $r = 0{\cdot}82$, acceptance $r = 0{\cdot}91$, perceived benefits $r = 0{\cdot}77$) and social support (perceived support $r = 0{\cdot}75$ and social network $r = 0{\cdot}69$). Only the VAS scale for pain, the least common symptom in patients with psoriasis, proved less stable in this sample ($r = 0{\cdot}32$, $P < 0{\cdot}05$).

Sensitivity to change

Sensitivity to change was evaluated by administering the ISDL in an additional cohort of 65 patients with psoriasis both before and after ultraviolet (UV) B radiation therapy. All respondents filled in the ISDL at intake and again after reaching 'clearance' (defined as <10% of the skin being affected), which period varied between several weeks and months. We expected particularly the scales for physical functioning and disease-related stressors to indicate changes after successful UVB therapy as well as the generic outcomes for psychological well-being and illness cognitions. Pairwise t-tests of the two assessments showed beneficial changes for the disease-specific outcome measures of skin status ($t = 13{\cdot}73$, $P < 0{\cdot}001$), physical symptoms (itch $t = 10{\cdot}39$, $P < 0{\cdot}001$; fatigue $t = 5{\cdot}86$, $P < 0{\cdot}001$; pain $t = 5{\cdot}02$, $P < 0{\cdot}001$), scratching response (conscious $t = 8{\cdot}97$, $P < 0{\cdot}001$; automatic $t = 4{\cdot}16$, $P < 0{\cdot}001$) and disease-related stressors (daily-life impact $t = 7{\cdot}16$, $P < 0{\cdot}001$; stigmatization $t = 4{\cdot}36$, $P < 0{\cdot}001$). Significant improvements were also found for the generic outcome measures of psychological functioning (anxiety $t = 4{\cdot}66$, $P < 0{\cdot}001$; negative mood $t = 4{\cdot}83$, $P < 0{\cdot}001$; positive mood $t = -3{\cdot}80$, $P < 0{\cdot}001$) and illness cognitions (helplessness $t = 3{\cdot}85$, $P < 0{\cdot}001$; acceptance $t = -2{\cdot}94$, $P < 0{\cdot}01$; perceived benefits $t = -2{\cdot}70$, $P < 0{\cdot}01$). As expected, no significant changes were found for the social support subscales.

The scale's sensitivity to change was further examined in 49 patients with AD in an effect study of a five-session cognitive

Table 2 Intercorrelations of the Impact of Chronic Skin Disease on Daily Life (ISDL) scales for the patients with psoriasis and atopic dermatitis[a]

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Physical functioning																
1. Skin status		0·47***	0·19*	0·44***	0·42***	0·23*	23***	0·17*	−0·19*	0·43***	0·29***	0·39***	−0·17	0·21**	0·01	−0·08
Physical symptoms																
2. Itch	0·55***		0·31***	0·52***	0·72***	0·31***	0·15*	0·10	0·02	0·32***	0·19*	0·20**	−0·20**	0·12	0·06	−0·11
3. Fatigue	0·53***	0·55***		0·36***	0·35***	0·18*	0·43***	0·36***	−0·29***	0·37***	0·25**	0·29***	−0·25**	0·05	−0·04	−0·12
4. Pain	0·36***	0·55***	0·51***		0·41***	0·15	0·23***	0·15	0·01	0·29***	0·27***	0·26***	−0·19*	0·18*	0·05	−0·07
Scratch response																
5. Conscious scratching	0·54***	0·74***	0·52***	0·42***		0·52***	0·19*	0·08	−0·11	0·35***	0·30***	0·27***	−0·24**	0·08	0·03	−0·28***
6. Automatic scratching	0·36***	0·39***	0·33***	0·24**	0·53***		0·14	0·05	−0·07	0·30***	0·26**	0·14	−0·09	0·13	0·03	−0·24***
Psychological functioning																
7. Anxiety	0·33***	0·26***	0·44***	0·32***	0·19*	0·22*		0·74***	−0·61***	0·57***	0·49***	0·57***	−0·41***	0·05	−0·38***	−0·25**
8. Negative mood	0·37***	0·21*	0·38***	0·29**	0·18*	0·14	0·57***		−0·58***	0·34***	0·29***	0·34***	−0·33***	−0·03	−0·22**	−0·20*
9. Positive mood	−0·28**	−0·11	−0·25**	−0·20*	−0·05	0·11	−0·44***	−0·51***		−0·34***	−0·36***	−0·38***	0·31***	0·09	0·38***	0·24**
Stressors																
10. Impact of disease on daily life	0·56***	0·36***	0·49***	0·43***	0·39***	0·40***	0·41***	0·25**	0·00		0·57***	0·67***	−0·44***	0·14	−0·27***	−0·25**
11. Stigmatization	0·33***	0·19*	0·24**	0·18	0·20*	0·26**	0·27**	0·26**	−0·04	0·37***		0·53***	−0·29***	0·27***	−0·30***	−0·22**
Illness cognitions																
12. Helplessness	0·48***	0·33***	0·45***	0·40***	0·34***	0·31***	0·54***	0·48***	−0·27**	0·69***	0·38***		−0·49***	0·19*	−0·19*	−0·19*
13. Acceptance	−0·35***	−0·30**	−25**	−0·46***	−0·32***	−0·23*	−0·53***	−0·42***	0·29**	−0·45***	−0·29**	−0·56***		0·25**	0·20**	0·16*
14. Perceived benefits	0·04	−0·20*	0·04	−0·05	−0·24**	−0·03	−0·03	−0·03	0·11	0·18	−0·05	0·11	0·31**		0·02	0·03
Social support																
15. Perceived support	−0·10	−0·03	−0·09	−0·11	0·01	0·00	−0·36***	−0·30**	0·42***	−0·12	−0·16	−0·25**	0·24**	0·18*		0·31***
16. Social network	0·00	0·02	−0·03	0·14	−0·04	−0·13	0·03	0·02	−0·03	−0·07	0·00	−0·02	−0·12	−0·08	0·15	

[a]Correlations for patients with psoriasis and atopic dermatitis are shown above and beyond the diagonal, respectively.
*P < 0·05; **P < 0·01; ***P < 0·001.

behavioural group programme in which the patients learned to cope with itch and to reduce scratching behaviour.[10] As expected, the pre- to post-treatment analysis showed an improvement for skin status ($t = 3{\cdot}85$, $P < 0{\cdot}001$), itch ($t = 5{\cdot}07$, $P < 0{\cdot}001$), and conscious and automatic scratch response ($t = 5{\cdot}47$, $P < 0{\cdot}001$ and $t = 4{\cdot}80$, $P < 0{\cdot}001$, respectively). Also pain scores had improved ($t = 3{\cdot}62$, $P < 0{\cdot}01$) and fatigue showed a tendency in this direction ($t = 1{\cdot}89$, $P = 0{\cdot}07$). Additional beneficial effects were found for daily-life impact ($t = 4{\cdot}31$, $P < 0{\cdot}001$) and the illness cognitions (helplessness $t = 2{\cdot}70$, $P < 0{\cdot}01$; acceptance $t = -3{\cdot}52$, $P < 0{\cdot}01$; perceived benefits $t = -3{\cdot}59$, $P < 0{\cdot}01$). There was also a tendency for an improvement of anxiety ($t = 2{\cdot}43$, $P = 0{\cdot}02$). No significant changes were found for negative and positive mood, stigmatization and social support.

Convergent validity

Pearson's correlation coefficients were calculated between the ISDL scales and the indicators of convergent validity, i.e. disease activity, disease-related quality of life, anxiety, depression and the personality characteristic of neuroticism in the two patient samples, psoriasis ($n = 173$) and AD ($n = 128$). Based on the literature, we assumed that elevated scores on these factors would be related to diminished physical and psychological functioning, higher levels of disease-related stress and more perceived helplessness, lower levels of acceptance and perceived benefits, and a lack of social support for both cohorts. As Table 3 shows, we found moderate (0·30–0·50) to relatively high (>0·50) correlations in the expected directions.

Computation of the Pearson's correlation coefficients for the ISDL and the patients' demographic variables (gender, age, marital status and educational level) and duration of disease showed the ISDL scales to be unrelated or only very modestly (<0·30) related to these variables. The helplessness scale was the exception and was (consistent with findings in other chronic conditions[16]) significantly associated with lower educational levels in the AD group ($r = -0{\cdot}33$, $P < 0{\cdot}001$).

User-friendliness and scoring

Although the ISDL measures a broad range of health dimensions, it takes the patient no more than 20–25 min to complete. Subscale scores can be calculated by summing up the subscale's item scores. As only the itch scale generates both a VAS score and three Likert scores, its response categories have to be standardized first. The anxiety scale is the only generic scale that contains some negatively phrased items that require recoding. Thanks to these easy-to-use and transferable features, the ISDL lends itself well for use in the clinical practice.

Discussion

Self-report measures offer an easy and inexpensive possibility to gain insight into a patient's health status and quality of life that clinical and laboratory data cannot provide. The advantages that the proposed dermatology-specific, multidimensional inventory has over generic or single-dimensional quality-of-life measures used for chronic skin diseases lie in the detailed and specific information it provides about the health areas that are affected by the skin condition and which may be susceptible to change through therapeutic interventions. The ISDL can thus serve as an important complementary tool in the evaluation of outcome assessments, therapeutic interventions and long-term care schemes.[7,8,22]

For the evaluation and selection of an appropriate instrument, several core criteria have to be fulfilled, such as the measurement of essential health areas, the user-friendliness, and high reliability and validity standards that allow consistent evaluations and replication.[7,8,22] The results presented in this report indicate that the ISDL meets these criteria of a sophisticated and comprehensive multidimensional health instrument for chronic skin diseases that assesses different generic and dermatology-specific health aspects. The comparative studies with various groups of patients diagnosed with psoriasis and AD showed the ISDL to be a reliable and valid instrument, with overall satisfactory to excellent results for internal consistency, stability and convergent validity. Its sensitivity to change was demonstrated in the studies evaluating dermatological UVB therapy and a cognitive behavioural treatment for itching. In summary, the ISDL appears to be a suitable tool for the assessment of the impact of chronic skin diseases in both research and clinical settings.

The additional contribution the ISDL could offer to both research and clinical practice was paramount in our efforts.[7,8,22] In contrast to existing, widely used self-report instruments in skin diseases, such as the DLQI or the Skindex,[17,18] the ISDL measures several hitherto uncharted dermatology-specific aspects through different physical, psychological and social dimensions. For example, the skin status scale, in which patients rate the extent of their skin problems for all affected body areas, provides a uniform indicator of disease severity that correlates relatively strongly with clinical observations of the dermatologist. The subscales also facilitate severity comparisons of different chronic skin diseases.[1,6,23,24] The scales delineating the patient's itch–scratch responses may help uncover underlying mechanisms of these behavioural patterns as they evolve in the course of the condition.[12,13] The same is true for the scores reflecting the visual manifestations of the skin condition and the resultant, perceived stigmatization.[14,15] As mentioned previously, an additional advantage of the generic scales is that these have already been tested in other chronic physical conditions, which has yielded norm groups for psychological functioning, impact of the disease on daily life, illness cognitions and social support for, among other populations, patients with rheumatoid arthritis, fibromyalgia and multiple sclerosis.[16,20] Finally, by assessing a broad scope of dimensions of physical, psychological and social functioning, the ISDL is specifically valuable for its use in chronic skin diseases that are commonly accompanied by various physical, psychological and social limitations in daily life.

Table 3 Correlations of the Impact of Chronic Skin Disease on Daily Life (ISDL) scales with other construct criteria for the patients with psoriasis (PS) and atopic dermatitis (AD)

ISDL scales		Disease activity	Skin-related quality of life (DLQI)	Anxiety (SCL)	Depression (SCL)	Neuroticism (EPQ)
Physical functioning						
1. Skin status	PS	0·68***	0·49***	0·02	0·11	0·00
	AD	0·73***	0·55***	0·42***	0·49***	0·25***
Physical symptoms						
2. Itch	PS	0·45***	0·45***	0·18*	0·16*	0·00
	AD	0·60***	0·43***	0·35***	0·35***	0·18**
3. Fatigue	PS	0·18*	0·29***	0·29***	0·39***	0·30***
	AD	0·41***	0·40***	0·36***	0·46***	0·35***
4. Pain	PS	0·41***	0·49***	0·31***	0·26**	0·06
	AD	0·45***	0·52***	0·34***	0·37***	0·20*
Scratch responses						
5. Conscious scratching	PS	0·50***	0·40***	0·19*	0·21**	0·10
	AD	0·56***	0·38***	0·32***	0·34***	0·21*
6. Automatic scratching	PS	0·33***	0·19*	0·08	0·12	0·02
	AD	0·41***	0·14	0·30**	0·27**	0·21*
Psychological functioning						
7. Anxiety	PS	0·15	0·51***	0·62***	0·74***	0·65***
	AD	0·26**	0·36***	0·57***	0·67***	0·72***
8. Negative mood	PS	0·09	0·31***	0·58***	0·71***	0·64***
	AD	0·30**	0·45***	0·51***	0·68***	0·51***
9. Positive mood	PS	−0·18*	−0·32***	−0·33***	−0·50***	−0·41***
	AD	−0·14	−0·24**	−0·26**	−0·40***	−0·41***
Stressors						
10. Impact disease daily life	PS	0·43***	0·70***	0·38***	0·42**	0·37***
	AD	0·48***	0·62***	0·27**	0·43***	0·37***
11. Stigmatization	PS	0·31***	0·58***	0·42***	0·43***	0·31***
	AD	0·29**	0·28**	0·20*	0·18*	0·32**
Illness cognitions						
12. Helplessness	PS	0·29***	0·72***	0·34***	0·40***	0·40***
	AD	0·34***	0·64***	0·46***	0·66***	0·55***
13. Acceptance	PS	−0·12	−0·35***	−0·23*	−0·32***	−0·38***
	AD	−0·33***	−0·48***	−0·47***	−0·55***	−0·45***
14. Perceived benefits	PS	0·12	0·18*	0·07	−0·03	0·03
	AD	−0·09	−0·04	−0·01	−0·05	−0·03
Social support						
15. Perceived support	PS	0·06	−0·16*	−0·25**	−0·34***	−0·29***
	AD	−0·10	−0·17	−0·06	−0·25**	−0·33***
16. Social network	PS	−0·15	−0·23**	−0·25**	−0·32***	−0·27**
	AD	0·05	0·06	0·16	0·03	0·00

*P < 0·05; **P < 0·01; ***P < 0·001. DLQI, Dermatology Life Quality Index; SCL, Symptom Checklist; EPQ, Eysenck Personality Questionnaire.

In this study, we have demonstrated the additional contribution, over current scoring systems, of the ISDL for dermatology-specific and generic use in research and clinical practice with regard to chronic skin disease. Despite these promising results, future studies will have to confirm the scale's reliability and applicability within the populations we tested as well as in patients with other chronic skin conditions. It can be expected that the ISDL will generate comparable results in most other skin diseases, particularly when itch is a prevalent symptom.[5,6] The scale's convergent and divergent validity also merits further investigation, for instance, by exploring associations with behavioural indicators (e.g. recordings of nightly scratch behaviour or itch-sensitivity measures) as well as clinical and laboratory data such as disease- and stress-related inflammatory parameters (e.g. interleukin 6). Finally, additional prospective research is recommended to study the predictive values and sensitivity to change of the ISDL scales during natural course studies and long-term interventions of diverse chronic skin diseases, further supporting the applicability of the ISDL for dermatological research and clinical practice.

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