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Experiences of stigmatization play a role in mediating the impact of disease severity on quality of life in psoriasis patients

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Summary

Background Psoriasis may have a severe impact on patients' quality of life (QOL) in several ways, an impact mediated by the mental or physical difficulties they have to deal with during the course of the disease and the various treatment regimens. In addition, psoriatic patients often suffer from experiences of stigmatization (EOS) related to the disease.

Objectives This study was designed to test the hypotheses that psoriasis patients report higher levels of stigmatization than a comparison group, and that their EOS play a role in mediating the impact of the severity of psoriasis on their QOL.

Methods One hundred patients with psoriasis (study group) and 100 patients with mixed skin problems (comparison group) were matched according to age, sex and education. All subjects answered questionnaires on EOS and QOL. A dermatologist diagnosed the diseases and measured severity scores. The Psoriasis Area and Severity Index score was used for psoriasis and a linear severity score for the comparison patients. The mediating effect of EOS was analysed using structural equation modelling (SEM). SEM is a multivariate statistical method used to examine the consistency of a theory relating one group of variables (termed a 'latent construct') to another: in the present study, the relationship between EOS and QOL.

Results Psoriatic patients were found to report significantly higher levels of EOS related to the disease, compared with the comparison group. No significant differences were found regarding QOL or severity of disease. Clinical severity of psoriasis was found to correlate negatively with QOL in psoriasis patients. EOS were found to have a complete mediating effect for the severity of disease on the QOL in patients with psoriasis. This result was not found among the comparison group patients.

Conclusions The results of this study indicate that psoriasis patients experience higher levels of stigmatization than do other dermatological patients, and that these EOS mediate the association between disease severity and patients' reported low levels of QOL. Treatment of psoriatic patients should consider these results and should include tools for psychosocial intervention.

Key words: experiences of stigmatization, psoriasis, quality of life

Psoriasis, one of the commonest chronic skin diseases, still poses a therapeutic challenge to the dermatologist and has a significant impact on patients' quality of life (QOL).[1,2] Treatment of psoriasis is aimed at inducing and maintaining remission. Several treatment modalities offer a fair rate of remission induction in some psoriasis patients, but complete remission is often not achieved[2] and patients are left to deal with a chronic, relapsing, visible lifelong disorder.

Many psoriasis patients experience social and psychological difficulties caused by their environment.[3,4] Psoriasis patients may feel humiliated when they need to expose their bodies during intimate relationships, swimming in public places, using public showers, or living in conditions that do not give appropriate

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privacy (army service, youth hostels, etc.).[5] Other difficulties confronted by psoriasis patients are the lack of control over the disease, losing the hope for a permanent cure and interference with future plans by an unexpected outbreak of symptoms.

Dermatologists are increasingly aware of the fact that understanding psoriasis needs more than Psoriasis Area and Severity Index (PASI) scoring, and that adequate delivery of treatment should include the patient's perception of his or her disease, the patient's hopes and expectations of the treatment and its impact on all aspects of life.[6]

QOL and, in particular, its social and psychological aspects, were found to be significantly reduced in psoriasis patients as measured by several QOL questionnaires; clinical severity of disease, as measured by the PASI score, negatively correlated with QOL.[7,8] Skin diseases in general may be expected to have an impact on a patient's QoL[9] but psoriasis is unique in its continuous impact[7,8] and the social stigmatization that psoriasis patients experience.[10,11]

The aim of this study was to examine the association between experiences of stigmatization (EOS) experienced by psoriasis sufferers and the impact of disease severity on the patients' QOL.

Materials and methods

Hypotheses

Our hypotheses were as follows:

Hypothesis 1. Differences between groups: psoriasis patients were expected to report higher levels of stigmatization than a comparison group.

Hypothesis 2 Within groups, the direct effect hypothesis: among the psoriasis group, but not for the comparison group, disease severity scores were assumed to be associated with low levels of QOL.

Hypothesis 3. The mediational effect hypothesis: high levels of stigmatization will account for (mediate) the relationships between disease severity and QOL assumed in hypothesis 2.

Participants and procedure

One hundred psoriasis patients and 100 comparison patients were examined and questioned. All subjects were recruited while visiting a dermatologist in an ambulatory setting. Most were members of the Clalit Health Services health fund, visiting the regional specialist dermatology clinic. A dermatologist who determined diagnosis and disease parameters examined each patient. The comparison group consisted of 100 patients suffering from dermatological diseases other than psoriasis (acne vulgaris, atopic dermatitis, other types of eczema, sun-damaged skin and fungal and viral skin infections). The groups were matched by age, sex and education.

Questionnaires were distributed, and were either completed before or after the visit or sent in by mail. The main outcome criteria were disease severity, QOL and EOS.

Outcome measures

Disease measurements. Severity of psoriasis was determined using the PASI score.[12] Assessment of other diseases in the comparison group could not be made with a standard tool because the comparison group consisted of a heterogeneous mix of skin diseases. This is an inevitable bias of this study. We therefore refer to this group throughout the text as the comparison group rather than the control group. The dermatologist was asked to determine the diagnosis and to score the severity of the disease (as compared with other patients with the same disorder), chronicity and skin surface area involved, on a relative scale. Severity was measured on a 1–5 scale (1 being minimal and 5 being very severe), chronicity on a 1–5 scale (1 being long-standing) and involved area on a 1–6 scale, as in the PASI. The total possible score ranged from 3 to 16.

Experiences of stigmatization. EOS were evaluated by the Questionnaire on Experience with Skin Disease (QES).[11] The QES questionnaire measures six stigmatization parameters: Refusal experiences, Retreat, Self-esteem, Rejection, Concealment and Composure.

Quality of life. In order to assess QOL we used a generic instrument, the WHOQOL-Bref.[13] This instrument was developed simultaneously by 15 academic centres world-wide under the auspices of the World Health Organization. It consists of 26 items divided into four broad areas: Physical health, Psychological health, Social relations and Environmental. In addition, we calculated a general score. This score was the mean across all items in the WHOQOL-Bref.

Results

Patient characteristics

Overall, there were 200 participants, 92 (46 for each group) women and 108 (54 for each group) men with

a mean ± SD age of 47·95 ± 16·74 years (46·65 ± 17·89 and 49·26 ± 15·48, for comparison and psoriasis patients, respectively). The two groups were not significantly different according to their means of age (t [198] = 1·10, $P = 0·27$).

Twenty-two patients (10 and 12 for comparison and psoriasis groups, respectively) had elementary school education (11%), 73 (41 and 32, respectively) had high school education (36·5%), 36 (20 and 16, respectively) had nonacademic further education (18%) and 69 (29 and 40, respectively) had academic further education (34·5%). The two groups were not significantly different according to the education distributions (χ^2 [d.f. = 3] = 0·32, $P = 0·32$).

Analytical strategy

The results of this study were collected as details of disease severity and answers to questionnaires on EOS and QOL. In order to examine the relationship between concepts such as EOS and QOL, which are both constructed of several subscales, we utilized the Structural Equation Modelling (SEM) method. This model has two basic elements: a measurement part ('measurement model') and a structural part ('structural model'). The measurement model delineates the association between measured and latent variables. In this study, measured variables were the various subscales of the questionnaires and latent variables were EOS and QOL. The structural model includes direct and indirect effects among latent variables (i.e. the effect of EOS on QOL). In simplistic terms, the SEM method organizes all the variables that construct QOL or construct EOS into one single group of variables. This group is then termed a 'latent construct'. As a 'latent construct' QOL and EOS can now be subject to statistical analysis and the relationship between them can be examined.[14]

All SEM analyses were performed with the AMOS 4·0 software[15] based on the variance–covariance matrix. We tested the fit of the measurement and structural models, using standardized maximum likelihood estimations. In evaluating the overall goodness-of-fit for the SEM models, the following criteria were used:

1 The χ^2 P-value, which, if $P > 0·05$, indicates that there are no statistically significant discrepancies between the observed data and the hypothesized model. Although a nonsignificant P-value has traditionally been used as a criterion for not rejecting an SEM, this criterion is overly strict and sensitive for models with numerous variables.[16] Therefore, we also used alternate criteria that reflect the real-world conditions of clinical research. We have chosen to accept a model in which the χ^2 divided by the d.f. ratio is ≤ 2 and in which the Comparative Fit Index (CFI), Goodness of Fit Index (GFI) and Normed Fit Index (NFI) are > 0·90. These moderately stringent acceptance criteria will clearly reject inadequate or poorly specified models, while accepting models that meet real-world criteria for reasonable fit and representation of the data.[16]

2 The NFI,[17] which specifies the amount of covariation in the data that is accounted for by the hypothesized model relative to a null model that assumes independence among factors.

3 The robust CFI,[18] the GFI[19] and the Adjusted GFI (AGFI[19]), indexes similar to the NFI, which adjust for the sample size (for the NFI, CFI and GFI a cut-off of 0·90 is generally accepted as indicating a good fit, where 1·0 indicates a perfect fit).

4 The Root Mean Square Error of Approximation (RMSEA[20]), which should be < 0·05.[21] The CFI, GFI, AGFI and NFI are all fit indices representing the degree to which our model differs from the empirical data measured: 1·0 represents a perfect fit, while values above 0·90 suggest an acceptable fit to the data (i.e. a value of 1 = 100% of the variance of the empirical data explained by the specified model); for the RMSEA, a value < 0·05 is a very good fit[16] (i.e. 0·05 = 95% of the empirical variance explained, while a value of 0·00 refers to 100%).

A correlation matrix and mean ± SD of the observed variables used in these analyses are presented in Tables 1 and 2. These data are provided to depict the first-order correlations among the separate observed indicator variables (i.e. among the subscales) of EOS and QOL that are not available through assessment of the relations among the latent constructs examined in the models.

As can be seen in Table 1 (bold correlations), the correlations between all of the EOS scales and all of the QOL scales, for both groups, are significant and negative (i.e. participants reporting high levels of EOS reported low levels of QOL). However, while among the psoriasis group the severity of disease correlated significantly with high levels of EOS and low levels of QOL (bold italic correlations), no significant correlations between severity of disease and QOL were found for the comparison group. Only three low significant positive correlations were found for the comparison group between severity of disease and scales of EOS. All

Table 1. Zero order correlations between the study variables

Variables	1	2	3	4	5	6	7	8	9	10
1. Severity of disease	–	***– 0·24*****	***– 0·30*****	***– 0·26*****	***– 0·18***	***– 0·45*****	***0·32*****	***0·38*****	***0·40*****	***0·32*****
Quality of life										
2. Environmental	***– 0·08***	**–**	0·71***	0·58***	0·61***	**– 0·55*****	**– 0·52*****	**– 0·54*****	**– 0·50*****	**– 0·45*****
3. Mental	***0·03***	0·65***	–	0·66***	0·64***	**– 0·52*****	**– 0·51*****	**– 0·51*****	**– 0·45*****	**– 0·40*****
4. Physical	***– 0·00***	0·70***	0·79***	–	0·61***	**– 0·51*****	**– 0·43*****	**– 0·53*****	**– 0·41*****	**– 0·42*****
5. Social	***– 0·09***	0·60***	0·72***	0·65***	–	**– 0·31*****	**– 0·32*****	**– 0·40*****	**– 0·28****	**– 0·31****
Experiences of stigmatization										
6. Refusal	***0·12***	**– 0·29****	**– 0·33*****	**– 0·32*****	**– 0·32*****	**–**	0·63***	0·67***	0·78***	0·56***
7. Retreat	***0·22****	**– 0·31****	**– 0·34*****	**– 0·37*****	**– 0·29****	0·77***	–	0·76***	0·66***	0·62***
8. Self-esteem	***0·19****	**– 0·43*****	**– 0·50*****	**– 0·46*****	**– 0·40*****	0·65***	0·71***	–	0·79***	0·70***
9. Rejection	***0·19****	**– 0·41*****	**– 0·37*****	**– 0·35*****	**– 0·39*****	0·75***	0·78***	0·72***	–	0·68***
10. Concealment	***0·16***	**– 0·44*****	**– 0·47*****	**– 0·43*****	**– 0·37*****	0·64***	0·64***	0·77***	0·64***	–

Psoriasis ($n = 100$) correlations are indicated above diagonal; comparison group ($n = 100$) correlations are indicated below diagonal. See text for significance of values in bold, bold italic and normal. $^{*}P < 0{\cdot}05$, $^{**}P < 0{\cdot}01$, $^{***}P < 0{\cdot}001$ (two-tailed tests).

other correlations (light correlations) showed significant internal correlations among the QOL scales and among the EOS scales for both groups. This supports the use of QOL and EOS as solitary homogeneous variables.

Hypothesis 1: differences between groups

Did patients in the psoriasis group have significantly higher levels of EOS? A MANOVA with patient groups as the independent variable and QOL subscales, EOS subscales and severity of disease scores as the dependent variables, was utilized in order to answer this question. As expected, the analysis revealed significant differences, only for the EOS subscales, with psoriasis patients reporting higher levels for all the EOS subscales (Table 2).

Table 2. Mean ± SD and *F*-values of study variables for the psoriasis group and the comparison group

Variables	Comparison group	Psoriasis	F (1,198)
1. Severity of disease	9·45 ± 9·01	8·13 ± 6·41	1·42 NS
Quality of life			
2. Environmental	15·09 ± 2·67	15·05 ± 2·57	0·02 NS
3. Mental	14·98 ± 3·07	14·35 ± 2·69	2·41 NS
4. Physical	15·23 ± 2·99	14·86 ± 3·49	0·65 NS
5. Social	15·01 ± 3·51	15·19 ± 3·38	0·13 NS
Experiences of stigmatization			
6. Refusal	11·20 ± 5·61	14·45 ± 7·34	12·38***
7. Retreat	13·13 ± 7·35	20·23 ± 8·31	40·92***
8. Self-esteem	9·78 ± 5·26	12·16 ± 5·67	9·46**
9. Rejection	11·37 ± 5·21	13·82 ± 5·95	9·61**
10. Concealment	7·11 ± 4·25	8·26 ± 4·46	3·48*

Psoriasis group ($n = 100$); comparison group ($n = 100$). NS, not significant, $^{*}P < 0{\cdot}05$, $^{**}P < 0{\cdot}01$, $^{***}P < 0{\cdot}001$ (two-tailed tests).

Structural Equation Modelling analysis: step 1, measurement model

Quality of life. We specified a latent construct (QOL) determined by four indicators (Environmental, Mental, Physical, and Social subscales of the questionnaire). The model specified was found to fit the observed data well (χ^2 [2, $n = 200$] = 0·11, $P = 0{\cdot}95$, χ^2/d.f. = 0·06, CFI = 1·0, GFI = 1·0, AGFI = 0·99, NFI = 1·0, RMSEA = 0·000). This model explained 60%, 77%, 66% and 60% of the variance of the Environmental, Mental, Physical and Social scores, respectively. The same direction was found when testing the model separately for each sample (χ^2 [2, $n = 100$] = 1·68, $P = 0{\cdot}43$, χ^2/d.f. = 0·84, CFI = 1·0, GFI = 0·99, AGFI = 0·96, NFI = 1·0, RMSEA = 0·000 and χ^2 [2, $n = 100$] = 4·0, $P = 0{\cdot}13$, χ^2/d.f. = 2, CFI = 0·99, GFI = 0·98, AGFI = 0·90, NFI = 0·98, RMSEA = 0·000 for the psoriasis and comparison groups, respectively).

Experiences of stigmatization. We specified a latent construct (EOS) determined by five indicators (Refusal, Retreat, Self-esteem, Rejection, and Concealment subscales of the questionnaire). The model specified was not found to fit the observed data well (χ^2 [5, $n = 200$] = 27·04, $P = 0{\cdot}000$, CFI = 0·97, χ^2/d.f. = 5·04, GFI = 0·95, AGFI = 0·84, NFI = 0·96, RMSEA = 0·15). Nevertheless, all the factors' indicators, paths and loading were substantial and statistically significant in the expected directions. This model explained 68%, 69%, 77%, 79% and 60% of the variance of Refusal, Retreat, Self-esteem, Rejection, and Concealment scores, respectively. Following the modification indices described by Jöreskob and Sörbom,[19] we

controlled for the correlations between the error terms of the Refusal with the Self-esteem and Rejection scores and the correlations between the error terms of Self-esteem and Concealment scores. The model specified fitted the observed data well (χ^2 [2, $n = 200$] = 2·49, $P = 0{\cdot}30$, χ^2/d.f. = 1·25, CFI = 1·0, GFI = 1·0, AGFI = 0·96, NFI = 1·0, RMSEA = 0·01). This model explained 68%, 71%, 79%, 75% and 56% of the variance of the Refusal, Retreat, Self-esteem, Rejection, and Concealment scores, respectively. Results from the χ^2 test of the differences between the two models indicated that the latter model significantly improved the fit to the data (χ^2 diff [3, $n = 200$] = 24·55, $P < 0{\cdot}000$). The same direction was found when testing this final model separately for each sample (χ^2 [2, $n = 100$] = 3·1, $P = 0{\cdot}21$, χ^2/d.f. = 1·55, CFI = 1·0, GFI = 1·0, AGFI = 0·91, NFI = 1·0, RMSEA = 0·000 and χ^2 [2, $n = 100$] = 0·01, $P = 0{\cdot}95$, χ^2/d.f. = 0·00, CFI = 1·0, GFI = 1·0, AGFI = 1·0, NFI = 1·0, RMSEA = 0·000 for the psoriasis and comparison groups, respectively).

Table 3 presents factor loading for the two constructs. The magnitudes of the associations between the indicators (the measured subscales) and the latent construct that they referred to (QOL, EOS) were substantial in the expected direction, and significant. After verifying the acceptability of the latent constructs, we proceeded to test for structural models.

Structural Equation Modelling analysis: step 2, structural model (guidelines for testing mediation)

We followed Baron and Kenny's criteria[22] for mediation, according to which: (i) there must be a significant association between the predictor (severity of disease) and the criterion variable (QOL); and (ii) in an equation including both the mediator (EOS) and the criterion variable (QOL) there must be a significant association between the predictor and the mediator, and the mediator must be a significant predictor of the criterion variable. If the significant direct relationship between the predictor and the criterion variable in the equation, including both the mediator and the predictor variable, declines, the obtained pattern is consistent with the mediation hypothesis. If the direct effect approaches zero, the mediator can be said fully (although not necessarily exclusively) to account for the relation between predictor and outcome.[22]

Hypothesis 2: analysis of the direct effects within groups

We assumed that EOS mediate the effects of severity of disease on QOL among psoriasis patients. In order to test this assumption, following the recommendations of Baron and Kenny,[22] we first estimated the direct effect of severity of disease on QOL, separately among the psoriasis patients and the comparison group patients. This model included the observed variable severity of disease and its direct paths of association on the latent variable, QOL. Among the comparison group the direct path between severity of disease and QOL was not significant (path coefficient = −0·02, t [99] = − 0·17, $P = 0{\cdot}86$), showing that in the comparison group severity of disease is not associated with the reported QOL scores. In contrast, among the psoriasis patients the severity of disease and QOL direct effects model (see Fig. 1) was found to provide a good fit to the observed data (χ^2 [5, $n = 100$] = 2·99, $P = 0{\cdot}70$, χ^2/d.f. = 0·60, CFI = 1·0, GFI = 0·99, AGFI = 0·96, NFI = 0·99, RMSEA = 0·0000; path coefficient = −0·32, t[99] = − 3·02, $P = 0{\cdot}003$), showing that in psoriasis patients severity of disease is associated with reports of low levels of QOL and that this association is significantly higher than the one found for the comparison

Table 3. Measurement model factor loadings

	Quality of life			Experience of stigmatization			R^2		
Variables	A	B	C	A	B	C	A	B	C
Environmental	0·78	0·80	0·76				0·60	0·64	0·58
Mental	0·88	0·87	0·90				0·77	0·75	0·81
Physical	0·81	0·76	0·87				0·66	0·58	0·76
Social	0·77	0·76	0·78				0·60	0·58	0·61
Refusal				0·83	0·75	0·87	0·68	0·57	0·77
Retreat				0·84	0·80	0·88	0·71	0·64	0·77
Self-esteem				0·89	0·95	0·81	0·79	0·90	0·66
Rejection				0·87	0·84	0·88	0·75	0·70	0·78
Concealment				0·75	0·79	0·73	0·56	0·62	0·53

A, sample as a whole ($n = 200$); B, psoriasis group ($n = 100$); C, comparison group ($n = 100$). All factor loadings are significant at $P < 0{\cdot}0001$.

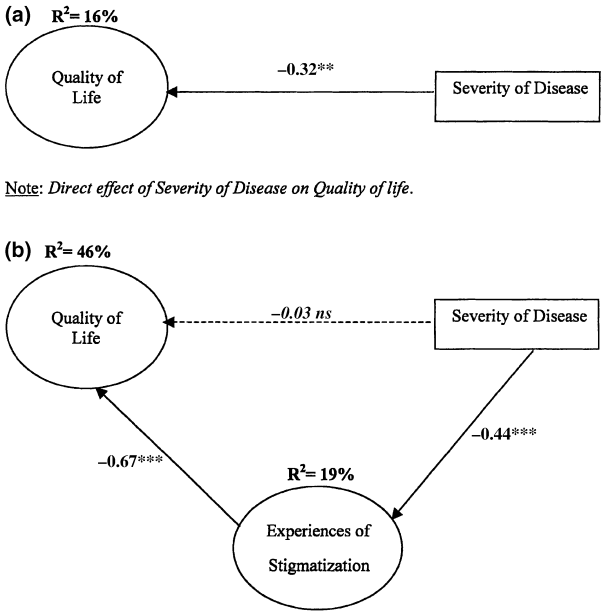

Figure 1. Direct effect of severity of disease on quality of life (a) and the mediating role of experiences of stigmatization (b). Estimates are standardized maximum likelihood parameters. Rectangle indicates measured variables, large ovals represent latent constructs, and unidirectional arrows depict hypothesized directional, or causal, links. *ns*, not significant, $^*P < 0{\cdot}05$, $^{**}P < 0{\cdot}01$, $^{***}P < 0{\cdot}0001$.

group (D = 0·31, Fisher's Z = 1·70, $P < 0{\cdot}03$). According to these analyses, as hypothesized, the comparison group did not meet the first condition and requirement for testing for mediation (i.e. a significant direct effect of EOS on QOL). Consequently, continued testing for possible mediation was justified only among the psoriasis group.

Hypothesis 3: analysis of the mediating effect

We assumed that the psoriasis patients' reported EOS mediate the effect of measured severity of disease on their reported QOL. In order to test this assumption we specified a complete mediation model that included an endogenous mediating latent variable, EOS. The exogenous predictor was the observed variable, severity of disease, and the latent variable QOL was the dependent variable in this model. The specified mediation assumed that higher severity of disease should be associated with higher EOS, which, in turn, should associate with decreased levels of QOL. This model (see Fig. 1) provided a plausible fit to the data (χ^2 [30, $n = 100$] = 35·6, $P = 0{\cdot}22$, χ^2/d.f. = 1·19, CFI = 0·99, GFI = 0·94, AGFI = 0·90, NFI = 0·95, RMSEA = 0·001), accounting for 19% of the variance of severity of disease and 46% of the variance of QOL.

Mediation has occurred when the indirect effects of a predictor through a mediator significantly reduce the predictor's direct effect.[22] As can be seen in Figure 1(a), the direct path from severity of disease to QOL was significant (path coefficient = −0·32, t [99] = − 3·02, $P = 0{\cdot}003$). In Figure 1(b), however, this path approached 0 (path coefficient = −0·03, t [99] = − 0·28, $P = 0{\cdot}78$). The drop in the coefficient of the direct path from severity of disease to QOL, once the stigmatization mediator was controlled, was significant according to Sobel's test[22]: Z = 3·35, $P < 0{\cdot}0001$. Thus, EOS is an almost full (although not exclusive) mediator of the association between severity of disease and QOL in psoriasis; high severity of disease relates to increased levels of EOS (path coefficient = 0·44, t [99] = 4·27, $P < 0{\cdot}000$), which in turn associates with decreased levels of QOL (path coefficient = −0·67, t [99] = − 5·39, $P < 0{\cdot}000$).

Discussion

QOL questionnaires have gained respect as an important tool able to reflect patients' evaluation of medical treatment outcomes. There are several operational approaches to measure health-related QOL in psoriasis, some generic (without relation to a specific disease) and one disease specific.[7] Most researchers agree that QOL is multidimensional, and needs to include physical, psychological, social and environmental aspects. In the current study we used a generic approach to assess general QOL aspects in psoriasis patients, and the degree to which these aspects are influenced by the disease.

A person with a social stigma is characterized by an unwanted social difference from the expected norm, setting him or her apart from others. People with a stigma are prevented from full social acceptance, and their social identity may be damaged.[23] Stigmatization may have a negative effect on the individuals' self esteem, but the consequences of the stigma are dependent on the immediate social context and the meaning of that context to the stigmatized person.[24] Social stigma has a particular meaning in patients with skin diseases, as the source of their stigmatization is visible.[11] Ginsburg and Link[10] identified and defined six stigmatization factors associated with psoriasis: anticipation of rejection, feeling of being flawed, sensitivity to the opinions of others, guilt and shame, positive

attitudes and secretiveness. Bleeding from the lesions was a strong predictor of stigma.

In this study, we demonstrated that disease severity, as measured by the PASI score, correlates negatively with psoriasis patients' QOL. This effect was found to be mediated by EOS in the psoriasis patients but not in the comparison group. We believe that our results point to a link between previous reports of reduced QOL in psoriasis patients on the one hand[2–8] and reports of EOS in psoriasis patients on the other.[10,11] The link between EOS and reduced QOL may broaden our understanding of the management of psoriasis. The results emphasize the central role that EOS play in these patients' lives.

Until a cure is eventually found, inducing remission or achieving a reduction in the PASI score in psoriasis patients may not be enough. While some psoriasis patients may be more influenced than others by EOS and other psychological factors, suggesting that 'stress reactors' may benefit from specific psychological and social interventions,[25] it seems likely that the vast majority of psoriasis sufferers will also benefit from such measures. EOS should be kept in mind whenever treating psoriasis patients: physical treatment should be accompanied by patient education and reassurance, and by family and social interventions. Delivery of care to any patient is more than a mere prescription; in psoriasis patients this seems to be of increased importance, necessitating understanding of the impact of stigmatization and the use of psychosocial intervention tools.

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