

SHORT REPORT

Role of illness representations and coping in patients with atopic dermatitis: a cross-sectional study

C. Schut,^{1,*} A. Felsch,¹ C. Zick,² K.-D. Hinsch,³ U. Giele^{3,4}, J. Kupfer¹¹Institute of Medical Psychology, University of Gießen, Gießen, Germany²Department of Dermatology, Rehabilitation Center Borkum Riff, Borkum, Germany³Clinics for Dermatology and Allergology, University of Gießen, Gießen, Germany⁴Clinics for Psychosomatic Medicine and Psychotherapy, University of Gießen, Gießen, Germany

*Correspondence: C. Schut. E-mail: christina.schut@psycho.med.uni-giessen.de

Abstract

Background Atopic dermatitis (AD) is a skin disease accompanied by psychological burden. It has been shown for other chronic diseases that illness representations and coping strategies are associated with disease-related burden and other outcome variables like time until patients return to work or health care use.

Objective The goal of this cross-sectional study was to investigate whether illness representations and coping strategies are correlated with the severity of AD and self-rated physical impairment of the patients.

Methods A total of 109 AD patients were examined at the beginning of their stay at a rehabilitation centre. They filled in validated questionnaires to measure illness perceptions (IPQ), coping strategies (EBS) and self-rated physical well-being (FEW). In addition, the severity of AD (SCORAD) was determined by a doctor.

Results Linear regression analysis revealed that a considerable amount of the variance in self-rated physical well-being (51%) could be predicted by particular illness perceptions and coping. Subsequent multiple mediation analyses indicated that certain coping strategies (active problem solving and depressive reactions) mediated the effect of illness representations on self-rated physical well-being. In contrast, only 7.4% of the SCORAD could be predicted by the IPQ scale illness identity.

Conclusion This study showed that illness representations and coping are highly associated with self-rated physical impairment in AD patients. Therefore, this patient group might profit from cognitive behavioural interventions designed to alter patients' illness perceptions. The hypothesis that a modification in illness perceptions leads to a faster recovery and a more rapid return to work should be tested in future randomized controlled trials.

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Conflicts of interest

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Introduction

Atopic dermatitis (AD) is a chronic skin disease characterized by pruritus, lichenification at typical sites of the body and the occurrence of (other) atopic diseases in the patient herself/himself or in family members.¹ AD affects about 3% of German adults.²

Following Leventhal's self-regulatory model³, patients with chronic diseases form illness perceptions regarding e.g. the timeline or consequences of the disease, which lead to certain coping strategies.³ Lazarus & Folkman (1984) postulate two kinds of coping: problem-oriented and emotion-regulated coping.⁴ Certain illness representations and a special way of coping can worsen the severity of a disease, but can also affect the use of

health care or time of absence from work.⁵ For patients with tinnitus,⁶ psoriasis, chronic obstructive pulmonary disease (COPD) or rheumatoid arthritis,^{7,8} it has been shown that illness representations and coping are strongly associated with social functioning and the impairment caused by the disease.

For patients with (atopic) dermatitis, a significant correlation was found between illness perceptions and quality of life⁹ and the emotional response to the disease respectively¹⁰. Patients reported higher emotional impact if they believed in negative consequences, a cyclical timeline, psychological causes of AD and that they had low personal control over the illness which they believed to cause many symptoms (high illness identity).¹⁰

Table 1 Results of the correlation analyses.

	1.FEW total score	2	3	4	5	6	7	8	9	10	11	12	13	14
2. SCORAD	-0.268**													
3. Illness identity (IPQ)	-0.468**	0.273**												
4. Belief that psychological factors cause the disease (IPQ)	-0.400**	0.043	0.296**											
5. Belief that chance causes the disease (IPQ)	0.024	0.118	-0.158	-0.144										
6. Perceptions about the timeline of the disease (IPQ)	-0.046	-0.003	-0.058	-0.137	-0.046									
7. Belief in bad consequences of the disease (IPQ)	-0.515**	0.105	0.264**	0.325**	0.126	0.091								
8. Belief in having control over the disease (IPQ)	0.241*	-0.118	-0.071	-0.004	-0.018	-0.088	-0.291**							
9. Active problem solving (EBS)	0.478**	-0.185	-0.103	-0.203*	-0.132	-0.047	-0.269**	0.366**						
10. Search for social support (EBS)	0.122	0.001	0.036	-0.036	-0.170	-0.024	-0.126	0.238*	0.488**					
11. Depressive reactions (EBS)	-0.573**	0.069	0.347**	0.404**	-0.023	0.130	0.580**	-0.316**	-0.405**	-0.192*				
12. Comforting cognitions (EBS)	0.413**	-0.046	-0.194*	-0.098	-0.089	-0.058	-0.294**	0.339**	0.478**	0.474**	-0.455**			
13. Age	0.158	0.056	-0.085	0.029	0.122	-0.193*	-0.025	-0.069	-0.001	-0.288**	-0.234*	-0.083		
14. Gender	-0.051	0.009	0.176	0.070	-0.174	-0.113	-0.107	0.119	0.073	0.313**	-0.022	0.266**	-0.296**	
15. Illness duration (in years)	0.109	-0.057	-0.051	-0.202*	-0.111	0.257*	-0.122	0.037	-0.023	-0.003	-0.168	0.017	0.161	-0.152

Note. The sample size ranged between $n = 104$ and $n = 109$.

* $P \leq 0.05$.

** $P \leq 0.01$.

However, so far it has not been investigated whether illness representations and coping strategies are associated with *physical* well-being in this patient group. Thus, this is the *first* study aimed at analysing whether illness perceptions and coping strategies are related to physical impairment in AD patients. In contrast to emotional distress, which refers to experiencing feelings of depression and anxiety when thinking about the disease, physical impairment refers to not feeling *physically* resistant, capable or dynamic.¹¹

Method

Participants and procedure

A total of 109 participants were recruited at a rehabilitation clinic (Borkum, Germany). Patients who completed written consent were given questionnaires, which they filled in during their first days at the clinic. The doctor in charge examined the severity of AD during the first anamnesis.

The study was approved by the local ethics committee, which found the study protocol to conform to the Declaration of Helsinki. Participants were free to withdraw from the study at any time.

Measures

Predictor variables

- 1 The Illness Perception Questionnaire¹² (IPQ) was used to assess patients' illness representations. It measures patients' illness identity (the number of symptoms patients relate to AD), causal attributions (psychological attributions, risk factors, immunity, accident or chance,¹³) beliefs about the consequences and timeline of the disease as well as perceptions regarding the control over the disease. Cronbach's alpha ranged between 0.61 and 0.82, except for the two scales 'belief that risk factors cause the disease' ($\alpha = 0.41$) and 'belief that immunological factors cause the disease'

($\alpha = 0.28$), which were therefore excluded from further analyses.

- 2 The Ehrenfelder Inventory of Coping¹⁴ (EBS), a German adaptation of the Utrecht Coping List (UCL), was applied to measure how patients cope with stressful situations. It measures 'active problem solving', 'palliative behaviour', 'avoidance behaviour', 'search for social support', 'depressive reactions', 'expression of emotions' and 'comforting cognitions'. Cronbach's alpha for the EBS scales ranged between 0.66 and 0.83, except for the scales 'palliative behaviour' ($\alpha = 0.59$), 'avoidance behaviour' ($\alpha = 0.49$) and 'expression of emotions' ($\alpha = 0.29$). These scales were excluded from further analyses.

Criterion variables

- 1 The total score of the questionnaire for assessing subjective physical well-being (FEW)¹² was used as a first criterion variable (Cronbach's alpha = 0.93).
- 2 The scoring for atopic dermatitis (SCORAD)¹⁵ was used to assess the severity of AD.

Statistics

Statistical analyses were conducted using SPSS 21 (IBM, Ehningen, Germany). To keep the number of predictor variables to a minimum, correlation analyses were conducted first to identify illness perceptions and coping strategies that significantly correlated with self-rated physical well-being and the SCORAD. Afterwards, regression analyses were calculated to determine whether these variables were predictive for the criterion variables. In a first step, illness perceptions, and in a second step, coping strategies were included.

As recommended by Preacher and Hayes,¹⁶ multiple mediation analyses were subsequently conducted to estimate the mediation effects of the coping strategies. Following the approach by Vollmann *et al.*,⁶ multiple mediation analyses were calculated in case the effect of an illness representation was reduced by at least

Table 2 Results of the regression analysis predicting physical well-being (FEW)

Step	Variable	B (after step 1)	B (after step 2)
Step 1	Illness identity (IPQ)	−0.313***	−0.276***
	Belief that psychological factors cause the disease (IPQ)‡	−0.199*	−0.120
	Belief in bad consequences of the disease (IPQ)‡	−0.332***	−0.218*
	Belief in having control over the disease (IPQ)	0.122	−0.021
Step 2	Active problem solving		0.266**
	Depressive reactions†		0.160
	Comforting cognitions		0.091

Step 1 adj. $R^2 = 0.405$, Step 2 $\Delta R^2 = 0.105$; adj. $R^2 = 0.51$. Only those illness representations and coping strategies that correlated significantly with physical well-being (FEW) were entered into the regression analysis to keep the number of predictor variables to a minimum.

†The scale 'depressive reactions' was coded so that higher scores reflect more positive coping that means less depressive reactions. ‡Mediation was subsequently tested (Table 3).

* $P \leq 0.05$; ** $P \leq 0.01$; *** $P \leq 0.001$.

0.05 points when coping strategies were added in step 2 of the regression analysis.

Results

Sample characteristics

The sample consisted of 109 AD patients (33 males, 75 females; one without statement), who were 41.3 years (SD = 11.9; range from 18 to 62) on average. The illness duration was 26.4 years on average (SD = 15.7). Seven patients suffered from mild, 59 from moderate and 43 from severe AD (mean SCORAD: 46.3 (SD = 17.9)).

Correlation analyses (CA)

Seven scales of the IPQ and EBS were significantly associated with self-rated physical well-being (FEW). Only one scale of the IPQ was significantly associated with the SCORAD (Table 1).

Results of the regression analyses

The first linear regression analysis revealed that 51% of the variance of self-rated physical well-being could be predicted by illness representations and coping strategies (Table 2). As standardized β -coefficients for the IPQ-scales 'belief in bad consequences of the disease' and 'belief in psychological causes of the disease' were reduced by at least 0.05 points when coping

Table 3 Results of the multiple mediation analyses

Effect	b	β	BCa 95% CI	
			Lower	Upper
Independent variable: Belief that psychological factors cause the disease (IPQ)				
IV – Mediator 1	−0.095*	−0.2026*	–	–
IV – Mediator 2 ^a	−0.2375***	−0.4038***	–	–
IV – Mediator 3	−0.0551	−0.0983	–	–
Mediator 1 – DV	0.4733**	0.2413**	–	–
Mediator 2 ^a – DV	0.5269***	0.3370***	–	–
Mediator 3 – DV	0.2041	0.1244	–	–
IV – DV (total effect)	−0.368***	−0.4002***	–	–
IV – DV (direct effect)	−0.1867*	−0.2030*	–	–
Indirect effect of all mediators	−0.1813 ^b	−0.1972 ^b	−0.3179	−0.0847
Mediation mediator 1	−0.0449 ^b	−0.0489 ^b	−0.1245	−0.0063
Mediation mediator 2	−0.1251 ^b	−0.1361 ^b	−0.2494	−0.0541
Mediation mediator 3	−0.0112 ^b	−0.0122 ^b	−0.0647	−0.0052
Independent variable: Belief in bad consequences of the disease (IPQ)				
IV – Mediator 1	−0.1933**	−0.2689**	–	–
IV – Mediator 2 ^a	−0.5225***	−0.5795***	–	–
IV – Mediator 3	−0.2522**	−0.2936**	–	–
Mediator 1 – DV	0.4959**	0.2528**	–	–
Mediator 2 ^a – DV	0.4394**	0.2810**	–	–
Mediator 3 – DV	0.1452	0.0885	–	–
IV – DV (total effect)	−0.7259***	−0.5150***	–	–
IV – DV (direct effect)	−0.3639**	−0.2581**	–	–
Indirect effect of all mediators	−0.3621 ^b	−0.2568 ^b	−0.3845	−0.1482
Mediation mediator 1	−0.0959 ^b	−0.0680 ^b	−0.1628	−0.0179
Mediation mediator 2	−0.2296 ^b	−0.1629 ^b	−0.2902	−0.0550
Mediation mediator 3	−0.0366 ^b	−0.0260 ^b	−0.0913	0.0228

Note. Multiple mediation analyses were calculated with the IPQ-scales "belief that psychological factors cause the disease" and "belief in bad consequences of the disease" as independent variables, the coping strategies as mediators (mediator 1 = "active problem-solving"(EBS); mediator 2 = "depressive reactions" (EBS); mediator 3 = "comforting cognitions") and physical well-being (FEW) as dependent variable.

IV, independent variable; DV, dependent variable (physical well-being); b, unstandardized coefficient; β , standardized coefficient; BCa 95% CI, bias corrected and accelerated 95% confidence interval for β ; *** $P \leq 0.001$.

** $P \leq 0.01$.

* $P \leq 0.05$.

^aThe scale "depressive reactions" was coded so that higher scores reflect more positive coping that means less depressive reactions.

^bMediation effects were estimated by bootstrap analyses (5000 bootstraps). Mediation effects are significant at $P \leq 0.05$ (two tailed) when zero is not included in the 95% confidence interval.

strategies were added in step 2 of the regression analysis, multiple mediation analyses were calculated for these two scales. These indicated that the effect of these IPQ scales was mediated by the EBS scales 'active problem solving' and 'depressive reactions' (Table 3).

The second regression analysis indicated that 7.4% of the variance of the SCORAD could be predicted by the IPQ scale illness identity.

Discussion

This study showed that illness representations and coping strategies significantly correlated with *physical impairment* in AD patients. Thus, we were able to extend the results of a former study¹⁰ which showed that *emotional distress* caused by AD was associated with illness perceptions. Similar results to ours have been shown for psoriasis patients: Here, physical functioning was also associated with illness identity, but in contrast, illness duration also correlated significantly with physical functioning in these patients.⁷

Furthermore, we found support for Leventhal's self-regulatory model³ because the relationship between illness perceptions and self-rated physical well-being was mediated by coping strategies: The beliefs that psychological factors cause the disease and that the disease will have bad consequences led to less active problem solving and more depressive reactions which in turn had an impact on physical well-being.

To profit from these results, one has to consider that illness perceptions and coping behaviours are not static,¹⁷ but can be changed. As a next step it would therefore be desirable to conduct a qualitative follow-up study with focus groups to assess the beliefs about e.g. the consequences and the control over the disease in more detail. Interviews with AD patients might e.g. reveal that they experience themselves as helpless or overstrained when coping with AD. These issues could then be explicitly addressed in an intervention study aiming to change patients' illness perceptions and coping strategies. Cognitive behavioural training has already been shown to have positive effects on physical impairment in AD patients,¹⁸ but whether these effects were due to changes in coping strategies/illness perceptions remained unclear.

Interestingly, the second regression analysis indicated that only 7.4% of the SCORAD could be predicted by the IPQ scale illness identity. The different impact of the predictors on either self-rated physical well-being (FEW) or the severity assessed by the doctor (SCORAD) might be explained by the fact that the perception of the severity of AD and of its effects on physical impairment differs between patients and doctors. Therefore, the subjective stage of the disease should be considered in the treatment of AD patients, e.g. by assessing patients' illness perceptions additionally to the SCORAD, before suggesting a treatment (medication and/or psychological intervention). This suggestion is also consistent with the statement of other authors⁵ that 'nega-

tive illness perceptions (...) are associated with increased future disability and a slower recovery, independent of the initial, medical severity of the condition'.⁵

Of course, there are some limitations to the study: Since we only collected data at the beginning of a stay at a rehabilitation clinic, we could not determine whether illness representations changed during the stay at the clinic, as has been shown for patients with COPD.¹⁹ Second, concerning the questionnaires used, it would have been desirable to assess disease specific instead of general coping strategies, e.g. using the Marburger Skin Questionnaire²⁰ because Leventhal's model postulates that illness representations have an impact on *disease-specific coping*.³ Furthermore, it might have been more appropriate to use the revised version of the IPQ because it allows a more differentiated assessment of illness representations.¹³ Another limitation lies in the selectivity of the sample: Because we recruited patients at a clinic, we cannot generalize our results to AD outpatients.

Despite these limitations our study gives a hint as to which illness representations/coping strategies are related to physical impairment in AD patients and therefore should be addressed in education programs for AD patients.

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