

# Therapeutic Benefits in Atopic Dermatitis Care from the Patients' Perspective: Results of the German National Health Care Study 'Atopic Health'

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## Key Words

Atopic dermatitis · Health care · Quality of life · Patient Benefit Index · Therapy success

## Abstract

**Background/Aims:** Numerous therapies are recommended to treat atopic dermatitis. The German national health care study 'Atopic Health' generated nationwide data on the care situation from the patients' perspective. **Methods:** Data for 1,678 adult patients were collected within a retrospective cohort study throughout the year 2010. Six scores to capture satisfaction with care, quality of life (Dermatology Life Quality Index, EQ-5D-VAS), therapeutic success and benefits (Patient Benefit Index) were analyzed using descriptive methods and analysis of variance. **Results:** 82.1% of patients were highly satisfied with their treatment. Topical corticosteroids and climate therapies were associated with the best success ratings. Quality of life was moderately impaired (mean Dermatology Life Quality Index  $8.5 \pm 6.5$ ). 88.4% of the patients indicated a relevant therapeutic benefit (Patient Benefit Index  $\geq 1$ ) with significantly better scores for topical immunomodulating therapies and climate therapies. **Conclusion:**

The most frequently applied therapies presented pleasant success and benefit ratings, even if quality of life could be improved for more than one third of patients.

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## Introduction

Atopic dermatitis is one of the most widespread chronic inflammatory skin diseases of the industrialized countries with growing occurrence among both children and adults. The prevalence has at least reduplicated within the past three decades. According to different current studies, 5–20% of children and 1–4% of adults suffer from this chronic skin disease [1–3]. Most of the patients show frequent relapses over lifetime, which are aimed to be controlled by different therapeutic strategies.

The current German guidelines recommend a stepwise approach according to the clinical severity of atopic eczema [4, 5]. Step one consists of continuous local hydrating skin therapy together with avoidance of triggers such as house dust or food with allergic potential as e.g. milk, egg or soya. In case of light eczema, step two favors

an additional use of antipruritic and antiseptic topical therapy, mainly with short-term use of class 1 and 2 topical corticosteroids or calcineurin inhibitors. Patients presenting moderate eczema should be treated in step three with class 2 and 3 topical corticosteroids or calcineurin inhibitors. Step four recommends the use of systemic immunomodulating therapies as e.g. cyclosporine for persistent and severe forms of eczema. Phototherapy with UVA1 or UVB light can be applied as a further option in steps two to four, respecting restrictions such as cumulative doses, minimum age >12 years or co-medication contraindicating phototherapy. Furthermore, specific immunotherapy and the use of antihistaminic agents can be added in all four steps if indicated. Patient training, dietetic schemes, psychological attendance and climate therapy can be useful measures besides mere medical treatment.

However, this diversity of treatment options often does not provide sufficient relief of the chronic eczema. Patients miss long-term therapy benefit and suffer from frequent relapses. Besides the occurrence of systemic medication side effects, high individual effort for topical therapy application or a considerable time loss for several times weekly phototherapy impair patients' compliance, satisfaction and quality of life [1, 6–8].

Until now, the patients' perspective on the success and benefit of different treatments has not been analyzed in detail [9], although this is increasingly important regarding therapy selection on a background of rising health expenses [10, 11]. Recent studies within this research area focused either only on quality of life and cost comparisons between some single therapy options, or gave overviews about possible treatments [6, 8, 12–17].

One of the aims of the German national health care study 'Atopic Health' was to evaluate the current health care of patients with atopic dermatitis and their satisfaction with care structures and available treatment options. Furthermore, disease impact on quality of life as well as therapeutic success and benefits were supposed to be analyzed.

## Patients and Methods

### *Study Design and Recruitment*

In the context of the non-interventional cross-sectional cohort study 'Atopic Health', 8,510 standardized questionnaire sets (each with a physician and a patient section) were sent to 157 dermatologist offices and 17 outpatient dermatology departments in Germany, resulting in 1,678 usable questionnaire sets of 91 study centers. Center selection followed a two-step cluster sample meth-

od for selection with recruitment by lottery and by choice [18]. Data was collected between January and December 2010.

### *Patients*

Inclusion criteria were written informed consent, a confirmed diagnosis of atopic dermatitis and age  $\geq 18$  years. Ethics approval was gained from the ethics commission of the State Medical Association of Hamburg, Germany.

### *Outcome Parameters*

The clinical severity of atopic dermatitis was measured using the Scoring Atopic Dermatitis (SCORAD) index, which captures the extent and intensity of skin lesions as well as subjective symptoms. The score can take values from 0 to 103 [19]. The 5-year retrospective success of different therapies was measured on a four-point scale (3 = 'very successful', 2 = 'successful', 1 = 'hardly successful' and 0 = 'not successful'). Health care evaluation of the last years followed a five-point scale (1 = 'very good', 2 = 'good', 3 = 'moderate', 4 = 'bad' and 5 = 'deficient'). Patient satisfaction with the previous atopic dermatitis treatment was measured on a four-point scale (1 = 'very content', 2 = 'content', 3 = 'less content' and 4 = 'discontent'). Patients' quality of life was captured on the one hand by the Dermatology Life Quality Index (DLQI), which is one of the most established quality of life parameters, even though some conceptual weaknesses have been mentioned recently [20]. Hereby patients have to indicate how atopic dermatitis affects different aspects of everyday life on a four-point scale. After having these points summarized, a score from 0 to 30 can be calculated indicating 'no', 'little', 'moderate', 'strong' or 'very strong' impairment of quality of life [21, 22]. On the other hand, quality of life was determined by the simple and reliable EQ-5D-VAS from the EuroQol generic health index, where the patient has to assess his own global state of health on a standardized visual analog scale from 0 ('worst state of health') to 100 ('best possible state of health') [23, 24].

The recently developed Patient Benefit Index (PBI) provides a validated method for the assessment of patient-relevant treatment benefit related to individual importance of treatment needs in the form of a global score. Before starting a new therapy, patients have to rate the importance of twenty-five predefined treatment goals on a five-point scale. After their therapy they indicate to what extent these goals have been achieved through the respective therapy on a five-point scale. The index is calculated by averaging the preference weighted results of all items and can reach values from 0 to 4. The patient is supposed to have a relevant benefit from the respective therapy in case of a PBI  $\geq 1$  (cut-off value). The higher the value of the PBI, the higher the patient-defined therapy benefit [9, 25, 26].

### *Statistical Analysis*

Data input was executed by means of double entries by trained and experienced data managers. Congruence of the entries was checked and in case of discrepancy corrected by using the original questionnaires. All data were described with standard statistical parameters (frequencies for categorical data, mean value, standard deviation for continuous data).

It is important to notice that the big sample size of 1,678 subjects corresponds to high statistical power, which affects the results of the significance test. Differences with a probability of a type I (alpha) error  $< 0.05$  were considered as statistically significant in all analyses.

**Table 1.** Comparison of satisfaction and quality of life parameters, PBI and SCORAD for subgroups built according to current monotherapy

| Current monotherapy                  | n <sup>a</sup> | Satisfaction with health care (1+–5) |     | Satisfaction with treatment (1+–4) |     | DLQI (0+–30) |     | EQ-5D-VAS (0+–100) |      | PBI (0+–4)         |     |     | SCORAD (0+–103) |      |
|--------------------------------------|----------------|--------------------------------------|-----|------------------------------------|-----|--------------|-----|--------------------|------|--------------------|-----|-----|-----------------|------|
|                                      |                | M                                    | SD  | M                                  | SD  | M            | SD  | M                  | SD   | ≥1, % <sup>b</sup> | M   | SD  | M               | SD   |
| No therapy                           | 16             | 3.0                                  | 0.9 | 2.2                                | 1.2 | 6.2          | 6.2 | 72.1               | 24.5 | –                  | –   | –   | –               | –    |
| Topical corticosteroids              | 292            | 2.5                                  | 0.9 | 1.9                                | 0.8 | 7.7          | 6.1 | 67.0               | 21.4 | 91.1               | 2.5 | 1.0 | 39.4            | 17.3 |
| Topical immunomodulating therapies   | 95             | 2.4                                  | 0.8 | 1.7                                | 0.7 | 6.3          | 5.5 | 75.0               | 16.2 | 96.8               | 2.6 | 0.9 | 18.5            | 1.9  |
| Antihistaminic drugs                 | 14             | 2.7                                  | 1.1 | 1.8                                | 0.8 | 7.4          | 5.4 | 63.1               | 28.1 | 85.7               | 2.2 | 0.9 | 43.0            | 18.4 |
| Systemic immunosuppressive therapies | 52             | 2.5                                  | 1.0 | 1.9                                | 0.7 | 9.6          | 7.3 | 64.3               | 17.5 | 94.1               | 2.4 | 0.9 | 49.6            | 20.1 |
| Systemic corticosteroids             | 14             | 3.1                                  | 0.7 | 2.3                                | 0.8 | 9.7          | 6.6 | 51.1               | 30.1 | 78.6               | 2.0 | 1.0 | 46.0            | 22.5 |
| Specific immunotherapy               | 15             | 2.5                                  | 0.8 | 2.2                                | 0.9 | 9.1          | 6.4 | 55.7               | 27.2 | 71.4               | 1.9 | 1.3 | 40.6            | 16.5 |
| UV therapies                         | 14             | 2.8                                  | 1.0 | 1.9                                | 0.7 | 8.9          | 7.3 | 57.3               | 20.6 | 100.0              | 2.8 | 0.8 | 41.7            | 17.3 |
| Climate therapies                    | 65             | 2.6                                  | 1.0 | 1.9                                | 0.8 | 10.0         | 7.4 | 59.8               | 23.6 | 88.9               | 2.3 | 1.0 | 48.5            | 18.0 |
| Alternative therapies                | 13             | 3.0                                  | 0.9 | 2.2                                | 0.7 | 9.2          | 7.8 | 72.9               | 17.8 | 80.0               | 1.8 | 1.2 | 37.0            | 17.9 |

M = Mean; SD = standard deviation; + = scale value standing for the best possible condition; – = scale value standing for the worst possible condition.

<sup>a</sup> Patients with monotherapy at the time of the survey. <sup>b</sup> Percentage of valid values.

The above-mentioned parameters were analyzed for the whole sample first. In order to make comparisons between means of more than two independent groups, analysis of variance (ANOVA) supplemented by least significant difference post-hoc tests was applied. Equality of variances was assessed by Levene's test. For the variance analysis, ten different subgroups were built according to the monotherapy at the time of the query ('no therapy', 'topical corticosteroids', 'topical immunomodulating therapies' including the calcineurin inhibitors tacrolimus and pimecrolimus, 'antihistaminic drugs', 'systemic corticosteroids', 'systemic immunosuppressive therapies' including cyclosporine, mycophenolate mofetil and azathioprine, 'specific immunotherapy', 'UV therapies' including UVA, narrow-band UVB or PUVA, 'climate therapies' such as sea climate, high mountains or Dead Sea therapy and 'alternative therapies' as homoeopathy or acupuncture amongst others) (table 1). Emollients were allowed as concomitant basic therapy. Group sizes ranked from n = 13 to n = 292, with n = 590 patients altogether (35.2% of the whole study population) included for ANOVA analyses.

All statistical analyses were carried out using SPSS Statistics for Windows (version 20.0, IBM, Armonk, N.Y., USA).

## Results

### *Demographic and Clinical Characteristics of the Study Population*

1,016 (60.5%) of the 1,678 patients were female and 662 (39.5%) male, with an average age of  $38.4 \pm 15.9$  years.

The mean disease duration was  $22.1 \pm 15.1$  years. Regarding clinical characteristics of atopic dermatitis, 1,569 (93.8%) of the patients suffered from pruritus and 1,429 (85.4%) from typical eczema morphology. The course was chronic or chronic relapsing in 1,564 patients (93.5%).

72.1% showed a history of further atopic diseases and 49.4% a positive family history.

The mean SCORAD was  $42.3 \pm 18.6$  points, indicating a medium severity of the skin disease with a significant difference in ANOVA ( $p = 0.001$ ). As expected, patients treated with e.g. topical corticosteroids or immunomodulating therapies showed significantly lower SCORAD scores than patients with UV therapy or systemic immunosuppressive treatments (post-hoc tests  $p < 0.05$ , table 1).

For further details on the patient collective, please refer to the recently published overview of Langenbruch et al. [18].

### *Use and Appraisal of Therapies*

The most frequently used therapies within the past 5 years were emollients (90.4% of patients) followed by topical corticosteroids (85.5%), climate therapies (49.6%), antihistaminic drugs (38.7%) and topical tacrolimus (36.8%). The least frequently used therapies were PUVA (7.7%) and fasting therapy (5.5%) (fig. 1) [18].

With respect to the patients' appraisal of success, topical corticosteroids were ranked as 'successful' or 'very successful' by 85.3% of patients, followed by systemic corticosteroids (84.2%) and climate therapies (77.0%). Frequently used climate therapies were sea climate (31.0%), high mountains (13.4%) and Dead Sea therapy (5.2%), all of them showing nearly equal success rates (82.9, 75.1 and 73.1%, respectively). The least effective treatment from the patients' view were fasting therapy (28.4%) and topical tar preparations (34.0%) (fig. 2).

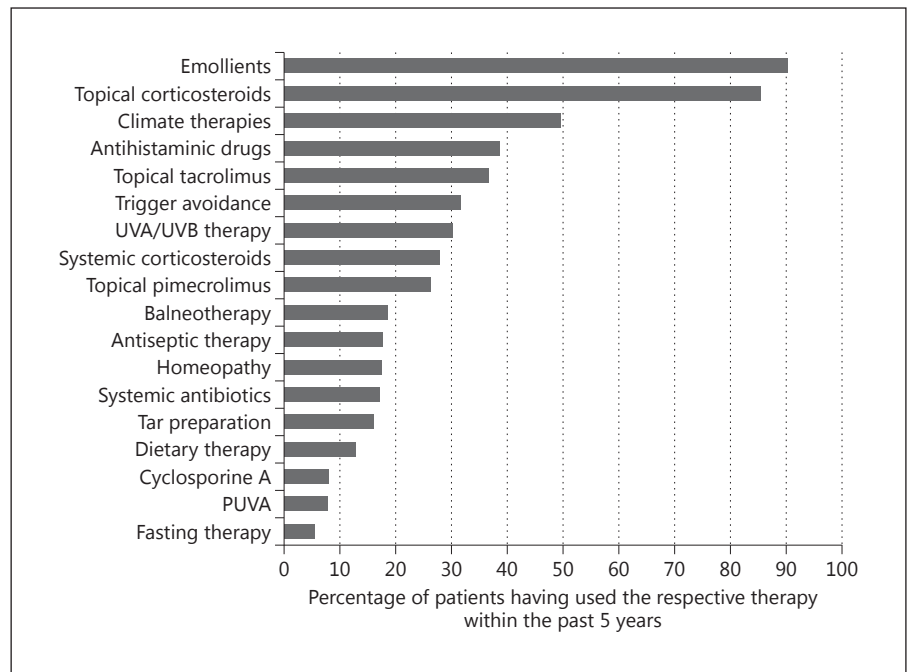


**Fig. 1.** Use of therapies (n = 1,588).

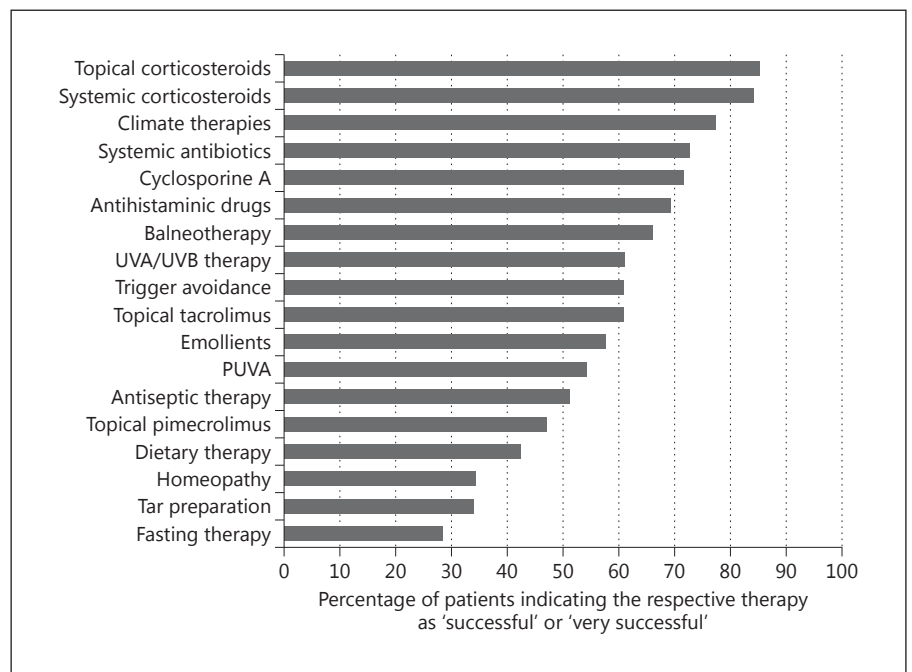


**Fig. 2.** Appraisal of therapies (n = 1,588).

### *Satisfaction with Health Care and Treatment*

Whilst 49.4% of all patients (n = 769) ranked the health care of the last years as 'very good' or 'good', 13.3% (n = 207) perceived the same as 'poor' or even 'deficient'. In contrast, 82.1% (n = 1,272) were 'very content' or 'content' and only 3.0% (n = 47) 'very discontent' with the previous treatments (tables 2, 3).

Variance analysis did not show significant differences in satisfaction with health care for different monotherapy groups (p = 0.099). The subgroups receiving topical immunomodulating therapies, topical corticosteroids, specific immunotherapy and systemic immunosuppressive therapies seemed by trend to be more satisfied with the care structures than other groups. Patients presently

**Table 2.** Health care evaluation (n = 1,556, 63 missing statements)

| Assessment of health care | n   | %    |
|---------------------------|-----|------|
| Very good                 | 182 | 11.7 |
| Good                      | 587 | 37.7 |
| Moderate                  | 580 | 37.3 |
| Bad                       | 156 | 10.0 |
| Deficient                 | 51  | 3.3  |

treated with systemic corticosteroid therapy, alternative therapies or no therapy assessed the health care far worse (table 1).

Subgroup analysis of patients' satisfaction with past treatments did not show any significant differences in the variance analysis either ( $p = 0.089$ ). By trend, the highest satisfaction was shown for patients presently receiving topical immunomodulating therapies, with a mean value of  $1.7 \pm 0.7$ . Patients under systemic corticosteroids showed the least satisfaction, with a mean value of  $2.3 \pm 0.8$  (table 1).

#### Health-Related Quality of Life

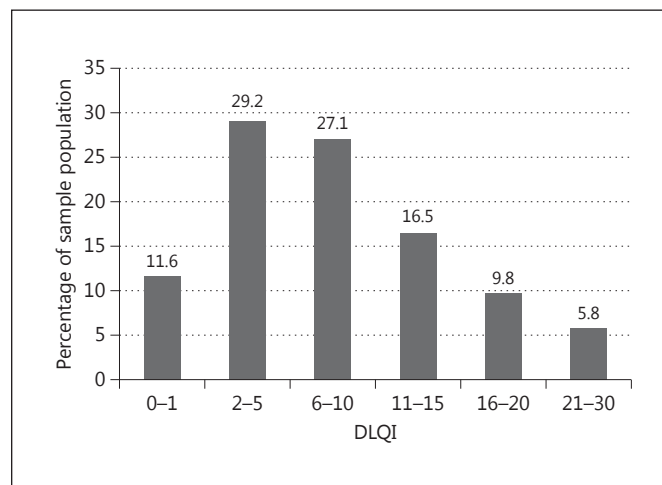
The mean DLQI added up to  $8.5 \pm 6.5$  points, which reflects a moderate affection of quality of life. 11.6% of patients had no impact on quality of life at all (DLQI values from 0 to 1), whereas 32.1% showed a strong or very strong reduction of the same (DLQI value  $>10$ ) (fig. 3).

Patients treated with a monotherapy of topical immunomodulating therapies (DLQI =  $6.3 \pm 5.5$ ) or topical corticosteroids (DLQI =  $7.7 \pm 6.1$ ) showed significantly lower DLQI values in the variance analysis (ANOVA  $p = 0.015$ ) than patients with UV therapy (DLQI =  $10 \pm 7.4$ ) or systemic immunosuppressive agents (DLQI =  $9.6 \pm 7.3$ ) ( $p < 0.05$  in post-hoc tests) (table 1).

The second parameter to capture quality of life, the EQ-5D-VAS value, presented a mean value of  $63.6 \pm 22.0$  points. 68.7% of patients chose a score higher than 50.0 points, which represents a rather good global health status evaluation (fig. 4). Also, EQ-5D-VAS scores were significantly different in variance analysis ( $p = 0.000$ ). 6.3% of the difference in health state can be explained by different treatment regimens (explained variance  $\eta^2 = 6.3\%$ ). The best scores were found for patients under topical immunomodulating therapies. Their EQ-5D-VAS ( $75.0 \pm 16.2$ ) was significantly higher than that of patients treated with specific immunotherapy, UV therapies, climate therapies, systemic corticosteroids, systemic immunosuppressive therapies or topical corticosteroids

**Table 3.** Satisfaction with previous treatment (n = 1,549, 70 missing statements)

| Patient satisfaction | n   | %    |
|----------------------|-----|------|
| Very content         | 496 | 32.0 |
| Content              | 776 | 50.1 |
| Less content         | 230 | 14.8 |
| Discontent           | 47  | 3.0  |

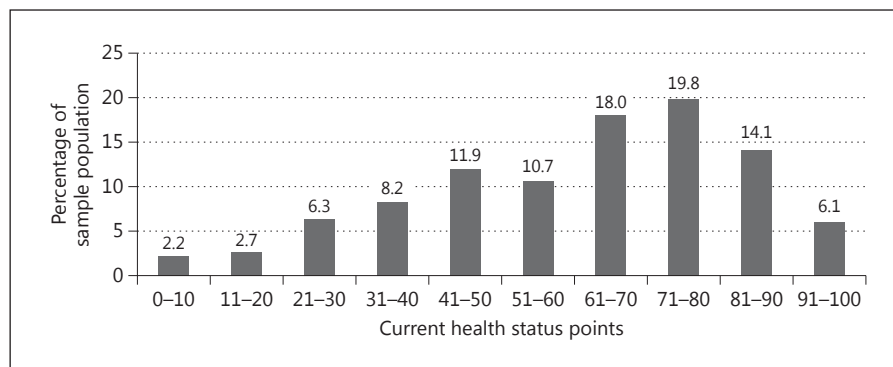
**Fig. 3.** Grouping of patients by DLQI (n = 1,591); 0 = minimum, 30 = maximum impairment of quality of life.

( $p < 0.01$  in post-hoc tests). Alternative therapies also showed a significantly higher EQ-5D-VAS value of  $72.9 \pm 17.8$  points than UV therapies, systemic corticosteroids or specific immunotherapy ( $p < 0.05$  in post-hoc tests) (table 1).

#### Specific Therapeutic Benefits

The patient benefit of a specific therapy was calculated using the PBI. The mean PBI was  $2.4 \pm 1.1$  points. 88.4% of patients reached an index value  $\geq 1$  and were therefore supposed to have a relevant benefit from therapy. Patients who had used climate therapies (PBI =  $2.8 \pm 0.8$ ) or topical immunomodulating therapies (PBI =  $2.6 \pm 0.9$ ) as current monotherapy presented significantly higher values than patients with specific immunotherapy (PBI =  $1.9 \pm 1.3$ ), systemic corticosteroids (PBI =  $2.0 \pm 1.0$ ) or alternative therapies (PBI =  $1.8 \pm 1.2$ ) ( $p = 0.035$ ;  $p < 0.05$  in post-hoc tests) (table 1). The highest percentage of patients with a PBI  $\geq 1$ , which reflects an at least minimum clini-

**Fig. 4.** Grouping of patients by EQ-5D-VAS (n = 1,577).



cally relevant therapeutic benefit, was found for climate therapies (100% of patients) and topical immunomodulating therapy (96.8% of patients).

## Discussion

The German national health care study ‘Atopic Health’ is the first to look at the care situation of patients suffering from atopic dermatitis in Germany in detail. In form of a retrospective cohort study, health care data were analyzed for a wide range of treatment options from the patients’ point of view. With one success rate, two scores for satisfaction with health care and treatment, two quality of life parameters (DLQI, EQ-5D-VAS) and the PBI, six different parameters were calculated for 1,678 patients.

### *Demographic and Clinical Characteristics*

Age, gender proportion and clinical characteristics of the study population were similar to other studies, with a female predominance in adolescent atopic dermatitis, decreasing prevalence with growing age, medium severity of the skin disease according to the SCORAD and a chronic relapsing course of the skin disease [27–30].

### *Therapeutic Success of the Most Frequently Used Treatments*

The most frequently used dermatological therapies within the study population were emollients (90.4%), topical corticosteroids (85.5%), climate therapies (49.6%), antihistaminic drugs (38.7%) as well as topical tacrolimus (36.8%). These therapies also led to high success rates seen from the patients’ perspective (57.8–85.3% of patients indicating good or very good success).

The effectiveness of topical corticosteroids in atopic dermatitis, for example, is well known [31]. In contrast to

some other studies [13, 32], topical corticosteroids seemed to be more successful than topical tacrolimus, which will be discussed later on [16].

Antihistamines were the fourth most used therapy in our study, with 69.2% of patients indicating good or very good success. This might be surprising at first sight, as in general itch in atopic dermatitis patients is hardly ever reduced by antihistamines. It has to be mentioned as a possible explanation for their frequent use that 54.7% of patients suffered from concomitant rhinoconjunctivitis or other allergies [33–35].

Besides these two discussion points, the success of the analyzed therapies seems to be consistent with other studies. However, it has to be kept in mind that within the current study successfulness was evaluated from the patients’ perspective using a four-point scale evaluation over a 5-year retrospective horizon. Objective success measurements, as e.g. reduction of the Eczema Area and Severity Index or SCORAD as well as improvement of the Physician Global Assessment, were not applied.

### *Quality of Life and Global State of Health*

Despite the broad range of applied therapies, one third of the study population showed a high impact of their skin disease on the quality of their lives (DLQI >10 in 32.1%) and on the perception of their global health state (EQ-5D-VAS <50.0 points in 31.7%). The mean DLQI of 8.5 points was similar to values for adult atopic dermatitis patients from recently published studies [30, 36, 37]. Especially UV therapies, systemic immunosuppressive therapies, specific immunotherapy, climate therapies and systemic corticosteroids seemed to be associated with lower quality of life (table 1).

Various phototherapy modalities such as narrow-band UVB, UVA1 or UVA/UVB therapy are common treatment regimens of atopic dermatitis [38–41]. As the

DLQI or the EQ-5D-VAS have not been used for evaluating UV therapy in atopic dermatitis patients yet, comparison of the present results is difficult [42]. However, high time expenditure for a treatment, which must take place several times a week, and limitation in long-term effectiveness might add up to a low quality of life [16].

Also patients under systemic immunosuppressive or corticosteroid therapy suffered from significantly stronger impairment of quality of life according to the DLQI or EQ-5D-VAS analysis. Both treatments are indicated in exacerbated cases of atopic dermatitis. A possible bias of a more severe skin status on the perception of quality of life was supported by a significant difference in the severity of atopic dermatitis (SCORAD ANOVA  $p = 0.001$ ). Moreover, well-known side effects on the cardiovascular system or metabolism might have additionally impaired quality of life.

#### *Patient Benefit of Different Treatment Regimens*

88.4% of patients received a more than relevant benefit from their respective therapy ( $PBI \geq 1$ ).

Patients with climate therapies (Dead Sea, high mountains and sea climate therapy) showed the highest PBI of 2.8 points. Besides, climate therapies seemed to provide notable therapy outcome also retrospectively, with 73.1% up to 82.9% of patients indicating a good or very good long-term success. On the other hand, this group of patients presented a comparably high impact on quality of life according to the DLQI and EQ-5D-VAS, which might be due to time and cost intensity of the treatment. Long-term analyses will be necessary for an in-depth assessment of the therapeutic role of climate therapies, also if some other studies have already confirmed a positive effect of especially Dead Sea therapy, too [43–45].

Tacrolimus as the fifth and pimecrolimus as the ninth most frequently prescribed therapy within the past 5 years are widely accepted standard treatments. In addition to the best results in quality of life and satisfaction parameters, this subgroup also presented the second highest score for patient-relevant benefit ( $PBI = 2.6$ ). Calcineurin inhibitors are already known as very sufficient patient-oriented therapies with long-term clearance rates [46]. Despite these excellent results, in case of current monotherapy, tacrolimus was ranked in only 60.7% and pimecrolimus in 47.2% of cases as a successful or very successful treatment when considering a 5-year retrospective horizon. Potential problems with compliance, fear of developing skin cancer and frequent therapy abruption because of side effects in the early treatment pe-

riod may explain why not more patients saw calcineurin inhibitors as a highly effective therapy [16]. This might also be the reason for the better success ranking of topical corticosteroids in the retrospective. It is known from the literature that, compared to tacrolimus, pimecrolimus seems to be less effective and to cause more frequent therapy abruption [47–49]. Patient education and appropriate co-medication within the early treatment period are necessary.

Topical corticosteroid application was not only the most commonly and successfully used therapy. With the third highest PBI of 2.5 points and good quality of life parameters ( $DLQI = 7.7$ ,  $EQ-5D-VAS = 67.0$ ) it also is a therapy which seems to fulfil important therapy aims at the highest level. An optimal treatment regimen and the combination with additional basic treatment are crucial to the prevention of relapses in the long term and to the improvement of patient satisfaction [50, 51].

In contrast, patients who had been treated with systemic corticosteroids as monotherapy did not only show two of the worst quality of life parameters ( $DLQI = 9.7$ ,  $EQ-5D-VAS = 51.1$ ), but also the third lowest patient-relevant benefit ( $PBI = 2.0$ ). These results stand in contrast to the frequent application (28.0% within the past 5 years) and excellent success ratings in the retrospective. 84.2% of the patients treated with systemic corticosteroids indicated that the therapy was ‘successful’ or ‘very successful’. The fast onset of therapeutic effects together with additional use of common treatment combinations may have led to a commemoration bias and a more positive evaluation in the long run from the patients’ perspective. Despite the general recommendation of a restrictive use [4, 5], more than one fourth of our patient collective was treated with systemic corticosteroids at least once within the past 5 years. This may be due to long-term clinical experience with dosage and handling of adverse effects. Unfortunately, validated analyses are rare, with only one placebo-controlled multicenter trial by Schmitt et al. [52] comparing prednisolone vs. cyclosporine and showing long-term therapeutic superiority of cyclosporine [16, 52, 53].

The lowest PBI was presented by patients who had been treated with alternative therapies and specific immunotherapy, both subgroups showing also impairments in quality of life. The relevance of these therapies for the cure of atopic dermatitis therefore has to be critically assessed, too. Specific immunotherapy in case of house dust mite or birch pollen was shown to have positive effects in case of severe eczema [54].

### Strengths and Limitations

The nationwide study 'Atopic Health' shows several limitations as already described in the paper of Langenbruch et al. [18]. A selection bias on patients and physicians with a stronger participation of more competent practices and more motivated patients might have resulted in an overestimated health care situation. Longitudinal outcomes could not be described due to the cross-sectional study design, for which reason the study results can only be interpreted using retrospective data.

Concerning the present analysis, statistics required patients on current monotherapy for correct group comparisons. Therefore only 35.2% of the study collective could be included in the ANOVA analysis, which nevertheless is a considerable number of 590 patients. Even if emollients were allowed as concomitant basic therapy, monotherapy with e.g. cyclosporine or UV therapy is quite random in clinical practice. In general, such patients are mostly treated in a much more complex regimen together with topical corticosteroids or antihistamines as indicated in the German guidelines. Therefore, success ratings and patient benefit might show different results when analyzing the same parameters for different treatment combination groups.

The aim of this analysis was to compare different treatment options regarding therapeutic success, quality of life and patient benefit. All these parameters, especially quality of life, are mainly influenced by the severity of the skin disease. To get a first idea, the SCORAD as a skin disease severity measurement was collected and showed amongst others significantly higher severity for patients treated with UV therapies or systemic immunosuppressive therapies than with topical corticosteroids or immunomodulating treatments. More detailed analyses, for example in the form of a regression analysis, are necessary to evaluate the complexity of influencing factors on treatment success.

A major strength of the study 'Atopic Health' is that it systematically collected a multitude of data for one of the

most frequent skin diseases on a national level. The current analysis provides detailed insights into therapeutic success from the patients' perspective. A variety of different scores was analyzed over a wide range of treatment options in order to give a first, but also detailed overview of the current state of health care in atopic dermatitis patients.

### Conclusion

The treatment of atopic dermatitis patients is quite satisfactory in many therapeutic fields. More than 50% of all patients ranked the – according to the German guidelines – most frequently used therapies as 'quite sufficient' or 'very sufficient'. Especially topical immunomodulating agents and topical corticosteroids seemed to provide notable therapy benefit together with good quality of life and long-term success. On the contrary, the still common use of systemic corticosteroids should be reconsidered in the presence of unsatisfactory quality of life and benefit parameters. Furthermore efforts should be made to increase quality of life when UV therapies or systemic immunosuppressive therapies are applied. Finally, the role of climate therapies should be discussed as a reasonable therapy alternative, according to the present results.

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### Disclosure Statement

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